Excluded or Included? Socio-economic Deprivation Among Ethnic Minorities in Chile (1996-2006)

¿Excluídos o incluídos? Pobreza en pueblos indígenas en Chile (1996-2006)

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Abstract

The aim of this paper is to provide a comprehensive analysis of the socio-economic position of indigenous groups in Chile, filling an existing gap in the literature on indigenous population in Latin America, more focused on countries with a higher presence of aborigine population. First, it is found that both moderate and severe poverty are more acute among indigenous than among non-indigenous citizens. Second, these results also apply when using measures of non-monetary deprivation, like unsatisfied basic needs indicators. Nevertheless, income polarization by ethnicity is not high. Third, there have been large improvements in the living conditions of indigenous people, most of them even more substantial than among the rest of population. Therefore, it cannot be concluded that Chilean indigenous group have been marginalized from the remarkable economic prosperity experienced by the country during the last years.

Keywords: Indigenous; Poverty; Unsatisfied Basic Needs; Chile.

Resumen

El objetivo de este trabajo es analizar en detalle la situación socio-económica de los pueblos originarios en Chile, para llenar, de esta forma, el relativo vacío existente en la literatura sobre pobreza en pueblos indígenas, que se ha centrado más en otros países de América Latina con mayor porcentaje de población indígena. En primer lugar, se observa que tanto la pobreza extrema como la moderada son mucho más importantes entre la población indígena que en el resto de la población. En segundo término, la aplicación de medidas de pobreza no monetaria, en este caso, indicadores de necesidades básicas insatisfechas, revela también importantes diferencias. No obstante, la polarización económica existente entre grupos étnicos es relativamente baja. Finalmente, se han producido mejoras muy relevantes en las condiciones de vida de los indígenas durante el periodo de análisis, mejoras que, en la mayor parte de los casos, han sido mayores que las observadas entre la población no indígena. Por tanto, a partir de nuestro análisis, no puede sostenerse que los indígenas chilenos hayan permanecido al margen de la prosperidad económica experimentada por el país en los últimos años.

Palabras clave: Indígenas; Pobreza; Necesidades básicas insatisfechas; Chile.

JEL Classification: J15, J71, I30.

1. Introduction[1]

The times when ethnic issues were not a field of interest of Economics passed. In fact, together with the International Labour Organization remarkable encouragement for countries to recognize the rights of indigenous people in the late eighties, a huge effort has been made in the last years in order to explore the socio-economic situation of indigenous groups in several Latin American countries.[2] Particularly, among others, it is worthy to mention the collective works of Patrinos and Psacharopoulos (1994), Hall and Patrinos (2005) and CEPAL (2006), which are devoted to study the economic disadvantages suffered by indigenous groups in Latin America, especially those related to health, labour market and human capital accumulation. Not by chance, those states where indigenous groups represent a larger share of total population (Bolivia, Ecuador, Peru, and Guatemala) are the cases most deeply analyzed, especially regarding earnings discrimination issues.[3]

The aim of this paper is to carry out a comprehensive analysis of the socio-economic position of indigenous group from 1996 to 2006 in Chile, a country that has enjoyed an enviable period of economic prosperity since the return to democracy in 1990.

In general, empirical research on Chilean indigenous people is scant. However, it is possible to mention several works devoted to these issues. For example, Valenzuela (2004) analyzes poverty among indigenous groups and inequalities in health and education using the *Encuesta de Caracterización Socioeconómica* (CASEN), the Chilean household survey, for 1996 and 2000; McEwan (2004) explores the explicative factors of the score test gap between

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[2] "Convention concerning Indigenous and Tribal Peoples in Independent Countries", General Conference of the ILO, Geneva, 1989. However, it should be mentioned that the ILO started to claim for the integration of ethnic and indigenous minorities in the middle of the past century.
[3] Apart from the studies mentioned above, see, for instance, Villegas and Núñez (2005) on Bolivia, Gallardo (2006) on Ecuador and Ñopo, Saavedra and Torero (2007) on Peru.

indigenous and non-indigenous; Mideplan (2005a) offers descriptive statistics on indigenous exploiting the CASEN; and Sanderson (2006) constructs unsatisfied basic needs indicators using the Census 2002. Two recent works of Agostini, Brown and Roman (2008a and 2008b) try to compute poverty rates for each indigenous group imputing an income from household surveys for 2002 Census units, though its estimations limits to 2002 and monetary indicators and do not report any time trend.

The case of Chile seems particularly interesting, since this country has experienced the highest growth rate in the region for the last two decades, achieving unparalleled reductions of poverty. From 1990 to 2006, according to the Central Bank of Chile, GDP increased by more than 150% in real terms and, according to the Economic Commission for Latin America and the Caribbean (ECLAC), poverty incidence declined from almost 40% in 1990 to less than 15% in 2006. However, meanwhile, inequality remained high and stable. Therefore, it is interesting to explore to what extent indigenous people in this country has profited from such general economic prosperity. Furthermore, Chile is not included in the extensive and comparative World Bank studies of Patrinos and Psacharopoulos (1994) and Hall and Patrinos (2005), providing an additional justification for deepening in the Chilean case and fill this gap in the economic literature on indigenous groups in Latin America.

This article aims to go a step further than previous works, exploring the evolution of the deprivation among indigenous groups from 1996 to 2006, combining the analysis of incidence, intensity and severity of poverty and extreme poverty with the use of other measures related to basic needs. In order to accomplish these objectives, the paper is divided in five sections as follows. First, several details regarding the database and identification issues of indigenous population are provided. The second section presents the methodological tools used to study monetary and non-monetary deprivation. In the third place, results of the analysis of ethnic polarization and poverty and unsatisfied basic needs among indigenous population compared to non-indigenous are presented and discussed. The final section summarizes the main conclusions of the paper.

2. DATABASE AND IDENTIFICATION OF INDIGENOUS GROUPS

The data source used in this work is the *Encuesta de Caracterización Socioeconómica* (hereafter, CASEN), a household survey carried out by the Chilean Ministry of Planning (Mideplan). It includes detailed data on income, dwelling and living conditions of indigenous and non-indigenous people for the 1996, 2000, 2003 and 2006 waves, which, consequently, are the only periods analysed here. The CASEN is carried out using a multi-stage and stratified sampling design, which has been taken into account in the empirical analysis. The survey is representative for the whole country, rural and urban areas, all the regions and most but not all of the municipalities (comunas). The Mideplan

jointly with the ECLAC use imputation techniques and an adjustment to national accounts data to correct for non-response and underreporting in questions related to household income.[4] This survey represents the main tool for evaluating changes in poverty and inequality in the country and it is also one of the main instruments for evaluating social policies and studying labour market.

According to Patrinos and Layton (2005), it is not easy to quantify the presence of indigenous population in Latin America. For the region as a whole, these authors estimate a total indigenous population between 22 and 34 million. The reasons for such a lack of precision are the different possible approaches that can be used to count individuals as indigenous. Particularly, the three more common criteria in the region are language, self-identification and geographic concentration, with self-identification being the dominant approach in the last censuses and surveys.

The criterion used by the CASEN and the Census 2002 for identifying indigenous population is self-identification. Particularly, the key question unfolds as follows: "*In Chile the law recognize the existence of 8 indigenous peoples. ¿Do you belong to one of them?*". If the individual responds affirmatively he/she must point to which of the eight indigenous groups recognized in the *1993 Indigenous People Act* (aymara, rapa nui, quechua, mapuche, atacameño, colla, kawashkar, and yagán) belongs.

According to the Census 2002, Chilean indigenous people represented 4.6% of total population.[5] According to the household survey, indigenous group account for 4.4% of total population in 1996 and 2000, 5.3% in 2003 and 6.6% in 2006. The available sample for indigenous population is large, from more than 11,000 observations of individuals in 1996 to almost 30,000 ones in 2006. Mapuches mean the largest indigenous group by far (since more than 8 out of 10 indigenous consider themselves belonging to the mapuche ethnic group). Unfortunately, the limited survey sample of indigenous and the small share of population represented by other indigenous people apart from mapuches, do not allow us to distinguish among the different ethnic groups in Chile in the analysis carried out here. In order to check the appropriateness of the CASEN for analysing deprivation among indigenous groups, we have compared the distribution of indigenous population by sex and age according to the CASEN 2003 and the Census 2002, respectively, finding that the household survey adequately matches such Census information.

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[4] The interested reader can access all the methodological documents and questionnaires of the survey at the website of the Mideplan (http://www.mideplan.cl/casen/).
[5] Those estimations are substantially different from those obtained from the Census 1992 (10.3%), where only those aged 14 and over were interviewed, and the self-identification question was related to the belonging to a culture (mapuche, aymara or rapa nui). The results obtained in 1992 are not comparable to later figures, because in 1992 a much larger part of the population declared to belong to the mapuche culture, a much broader concept than that of a people. The *1993 Indigenous People Act* established that a person belongs to an indigenous people if a person has an indigenous father or mother, if has an indigenous surname or maintains cultural features of the ethnic group. In addition, it is worth mentioning that the mapuches have often complaint about these figures and claimed that they represents roughly 10% of the total population in Chile (see www.mapuche.cl).

3. Methodological Issues

3.1. Poverty

The first step in measuring poverty risk is to define a set of indicators. Particularly, this paper makes use of the measures proposed by Foster, Greer and Thorbecke (1984), i.e., the FGT Index, which is defined as

$$P(\alpha;z) = \sum_{i=1}^{N} [g_i(y;z)]^{\alpha}$$

$$\text{where } g_i(y;z) = \max\left\{\frac{z-y_i}{z}, 0\right\} \text{ and } \alpha \geq 0$$

y_i denotes income of individual i and z represents the poverty line. g_i is the normalized poverty gap, that is, the income shortfall of each household or individual with respect to poverty line. **α** is a parameter that takes the value 0 for the Poverty Headcount (which measures the incidence of poverty); the value 1 for the Poverty Gap (which makes reference to the intensity of poverty) and the value 2 for the Squared Poverty Gap (related to the severity of poverty).

Finally, In order to measure monetary poverty, several methodological decisions related to empirics have to be taken. They are discussed below:

1. In relation to the definition of income we use only monetary income (including public transfers), excluding in-kind social expenditure (for instance, health or education subsidies).
2. Regarding equivalence scales, the analysis is carried out on a per capita basis, as the Economic Commission for Latin American and the Caribbean (ECLAC) and the Mideplan does.[6]
3. Both absolute and relative thresholds are used. First, we consider the indigency and poverty lines proposed by the ECLAC (and used by the Mideplan) for the period 1996-2006, which takes into account differences between rural and urban prices. The extreme poverty or destitution line is defined by the level of income required to achieve a consumption basket satisfying minimum food requirements. The value of poverty line is determined by increasing this budget in 75% in case of rural areas and 100% in case of urban ones (Mideplan, 2005b). Second, we also analyse how indigenous groups performs when we use a relative measure. Following the usual approach applied in OECD countries, 60% of median income is considered as the moderate

[6] Other authors, like Contreras (1996) and Ferreira and Litchfield (1999), have proposed and used other equivalences of scales. We have carried out the analysis using other scales and results mostly hold. These results are available upon request.

poverty lines. Detailed information on poverty thresholds can be found in the appendix (table A1).

3.2. Unsatisfied Basic Needs

Although probably no economist questions the multi-dimensionality of poverty, how to account for this feature in the empirical analysis is far from being clear or well-established in the field. Here, we adopt an eminently pragmatic approach, using the Unsatisfied Basic Needs (UBN) methodology. First, it is an indicator widely used in Latin America, so it is familiar and, to a certain extent, transparent. Second, its information requirements can be fulfilled by our database. The application of the UBN methodology presented here heavily draws on the concrete proposal made by ECLAC (Feres y Mancero, 2001), which defines the main dimensions of basic needs and suggests a set of variables in order to implement this approach, and the work of Sana and Pantelides (1999), who applies the UBN method to Argentina. Basically, the methodology consists in, first, selecting a group of variables related to housing, access to water and sewerage facilities, children's school attendance and the economic capacity of households; second, defining a threshold for each indicator; third, considering a need as unsatisfied when a particular indicator is below the minimum standards defined by the researcher. If there is any unsatisfied need in a given household, it is classified as a household with UBN (and an individual has UBN when he lives in a household with UBN). In other words, it is possible to define a UBN index that takes the value 0 if there is no UBN and the value 1 in other case. The specific criteria followed here comprised four dimensions: dwelling, water supply and sewerage facilities, children education and subsistence capacity. The particular variables selected and the conditions under basic needs corresponding to each dimension are considered unsatisfied are described below:

A. *Dwelling quality*. A household presents an UBN in this dimension if any of the following two conditions are verified:
   A.1. Housing quality. The household does not live in a house or a flat or dwelling is in bad condition -according to the definition proposed by Mideplan (2005b)-, which depends on the quality and condition of materials.
   A.2. Crowding. There are more than three people per bedroom.
B. *Water and sewerage*. A household is considered to have an UBN related to this aspect if we observe one of the two following features:
   B.1. Dwelling is not connected to public water network.
   B.2. Dwelling lacks of adequate toilet facilities, that is, it is not connected to public sewer system.
C. *Children education*. This UBN is conditioned on the presence of children between 6 and 12 years old not attending school.
D. *Subsistence capacity*. This dimension is analysed on the basis of an indicator of economic dependency of household proposed by the

National Institute of Statistics and Censuses of Argentina (INDEC, 1998). For each household h, this indicator is defined as

$$SC_h = \frac{1}{n_h} \sum_{i \in h} s_i w_i$$

where s denotes the years of schooling of each individual living in household h; w is a weight equal to 1 if the person is employed, 0.75 if he/she is a pensioner and 0 otherwise and n_h is household size. In words, each individual in our society is characterised by an income and, in order to compute the dependency ratio, we only calculate the sum of number of employed (or pensioned) members weighting by their educational level over each household; a sum then divided by household size. Mario, Gómez and De Oliveira (2004), who use this indicator to analyse economic capacity of households in Argentina and Brazil, establish several thresholds for this measure. Particularly, if SC is between 0 and 1.5, a household is considered to have a low subsistence capacity. Here, we apply this cut-off point, that is, an individual will present an UBN in this dimension if his/her household shows a SC not higher than 1.5

Furthermore, following ECLAC methodology (Feres and Mancero, 2001), construction of UBN indicators can be combined with poverty lines methods, obtaining bi-dimensional or combined measures of deprivation.[7] According to this methodology, households can be classified in four groups. Firstly, poor households (that is, those with per capita -or equivalent- income below poverty line) with UBN are considered to live in chronic poverty. In the second place, people living in poor households with no UBN are classified as situational poor individuals. Thirdly, the concept of structural poverty is applied to non-poor households with UBN, and, finally, non-poor households with no UBN are classified as socially integrated ones (see Table 1).

Table 1: Combination of Poverty Lines and UBN Methods

	Households with UBN	Households without UBN
Poor households	*Chronic poverty*	*Situational poverty*
Non-poor households	*Structural poverty*	*Socially integrated*

Source: Adapted from Feres and Mancero (2001).

3.3. Economic Polarization and Ethnicity

A last but not minor aspect of the situation of Chilean indigenous has to do with the concept of polarization, firstly formalized by Esteban and Ray (ER) (1994) and Wolfson (1994). The concept of polarization in Economics relates to

[7] For details on more complex methodologies see, for example, Boltvitnik (2003).

the extent that, given an income distribution, population is clustered around a small number of distant poles. The interesting feature behind this idea is that a polarized society is more likely to suffer social tensions and conflicts. Formally, ER defines polarization as the sum of antagonisms between individuals that belong to different groups, that is,

$$ER(\alpha) = \sum_{i=1}^{k} \sum_{j=1}^{k} p_i^{1+\alpha} p_j \left| \bar{y}_i - \bar{y}_j \right|; 1 \leq \alpha \leq 1.6$$

where $\bar{y}_i$ denotes the mean income (in logs) of group i, pi represents the share of population represented by group i and α is a parameter capturing the polarization aversion. ER formalization of polarization can be applied to income classes, but also to categorical variables, like ethnicity. Other authors (and Esteban and Ray themselves) have proposed variations of this measure. Among these other index of measurement, we make use of the one defined by Zhang and Kanbur (ZK) (2001), which, according to the authors, is able to provide an approach to polarization less linked to inequality and it is especially conceived to deal with categorical variables (regions, races, etc.). The ZK measure can be expressed as the ratio of between-group generalized entropy inequality to within-group generalized entropy measure. The most frequent choice –also followed here- is to make use of the Theil index, so this polarization measure can be formally written in the following form:

$$ZK = \frac{T_b}{T_w} = \frac{\frac{1}{K} \sum_{i=1}^{K} \ln \frac{\bar{y}}{\bar{y}_i}}{\frac{1}{K} \sum_{i=1}^{K} T_i} \text{ where } T_i = \frac{1}{n_i} \sum_{h \in i} \ln \frac{\bar{y}_i}{y_h}$$

where T_b and T_w are the between-group and within-group Theil index, respectively. T_i denotes the Theil index computed for group i.[8]

All calculations are performed using Stata 11 and the programs used in the article are readily available from the authors upon request. This analysis involves calculating standard errors taking into account sample design and, in order to make the paper more readable, detailed statistics of all measures described above are presented in the appendix (tables A2-A5). Such calculations have been carried out according to the guidelines suggested by Jenkins (2006), with the exception of polarization measures, where standard errors are obtained by bootstrapping (250 replications).

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[8] Note that we are using the Theil index with inequality aversion factor equal to zero. An alternative formulation of the Theil index is the generalized entropy measure with factor equal to one.

4. Results

4.1. Poverty

Results from the poverty analysis using the tools described above are presented in figures 1-4. While figures 1 and 2 describe the main trends in terms of absolute poverty, figures 3 reproduces poverty figures when using a relative concept of monetary deprivation according to the rules stated in section 3. Since indigenous population represents a low share of total population (roughly 5%), we only present estimates for indigenous and non-indigenous people, as estimates for total population are quite similar to non-indigenous ones. Nevertheless, this information is available from the authors upon request.

Figure 1 shows the evolution of extreme poverty among both indigenous and non-indigenous population. We can see that the incidence, intensity and severity of indigence have decreased along the analysed period. Trends in moderate poverty, depicted by figure 2, are also decreasing.[9] Another very interesting feature is the larger improvement observed among indigenous population. For instance, more than 40% of indigenous population were at poverty risk in 1996, while this share was around 20% ten years later. The gap in poverty rates between indigenous and non-indigenous fell between 1996 and 2006 (from 14.1 to 6.1% in moderate poverty and from 7.5 to 1.9 in the case of extreme poverty) and both the gaps and the change between 1996 and 2006 are statistically significant at least at 10% significance level, with the exception of the gap in FGT(2) in 2006.[10]

It seems interesting to compute the relationship between per capita growth and poverty reduction in Chile during the analysed period for both indigenous and non-indigenous population (table 2). At this respect, the first relevant point is that the largest poverty reductions also took place from 2003 to 2006. Particularly, more than a half of the fall of poverty rates occurred during this period, which registered the highest per capita growth rates (4.2% versus 2.8% during the whole period). In addition, in order to assess how growth correlated

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[9] It is worth to mention that there exist relevant urban-rural differences in poverty rates among indigenous. The indigenous population living in rural areas suffer from higher poverty rates than those indigenous living in urban ones. The indigenous population living in the Metropolitan region presents poverty rates very close to the average of non-indigenous and, thus, almost all the rural-urban divide is explained by the different rates of those living in Santiago and its surroundings. In both cases, rural and urban, the trend followed by poverty headcount ratios have been decreasing, especially in the case of rural indigenous, which has resulted in a reduction in the gap in poverty rates between rural and urban indigenous population. These results, not included in the paper for reasons of space, are available from the authors upon request.

[10] The analysis of the explanatory factors for such gap is beyond the scope of this paper. This exercise is carried out in Anton and Carrera (2007), who uses an Oaxaca-Blinder-type decomposition that allows determining which part of the gap is explained by observable household characteristics and which one is associated to differences in the effect of such endowments on the probability of being poor. Their results show that the percentage of the gap explained by characteristics declined across time (from 1996 to 2003), being the differences in coefficients more and more important.
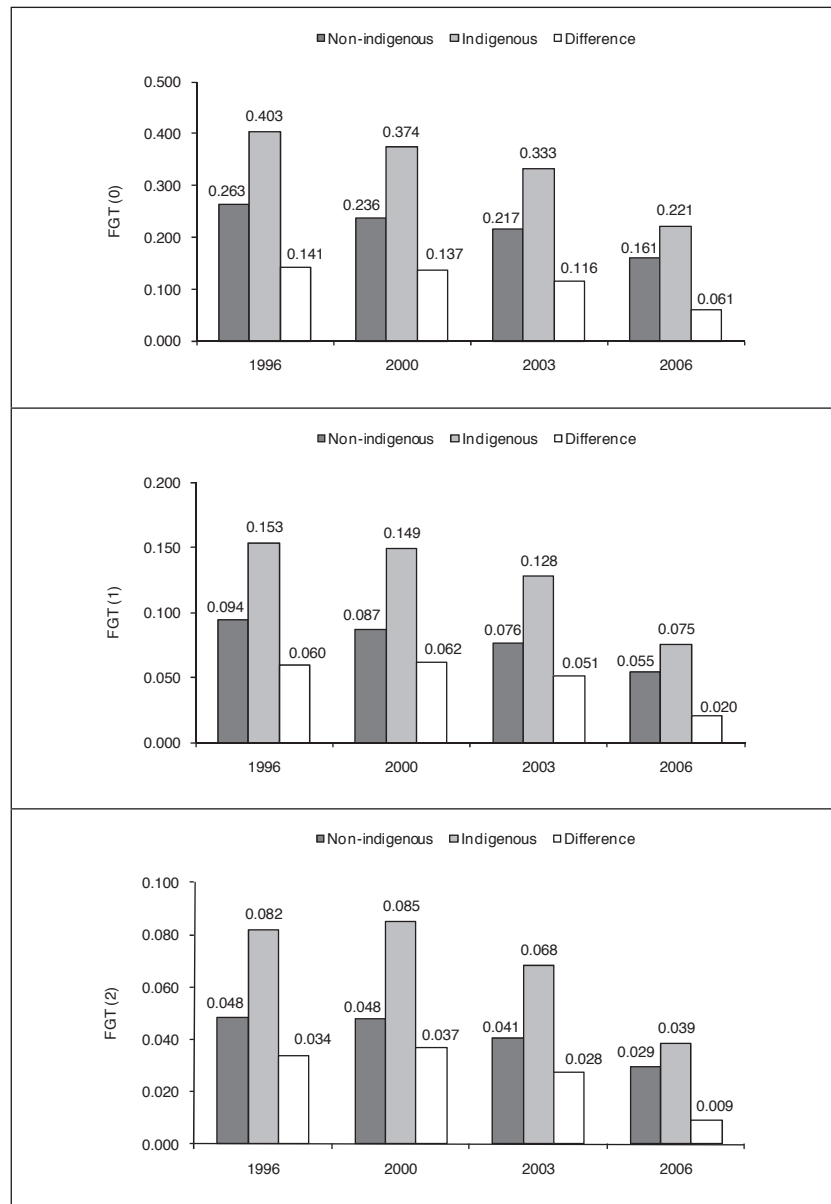
Figure 1: Extreme Poverty Among Indigenous and Non-indigenous in Chile (1996-2006)
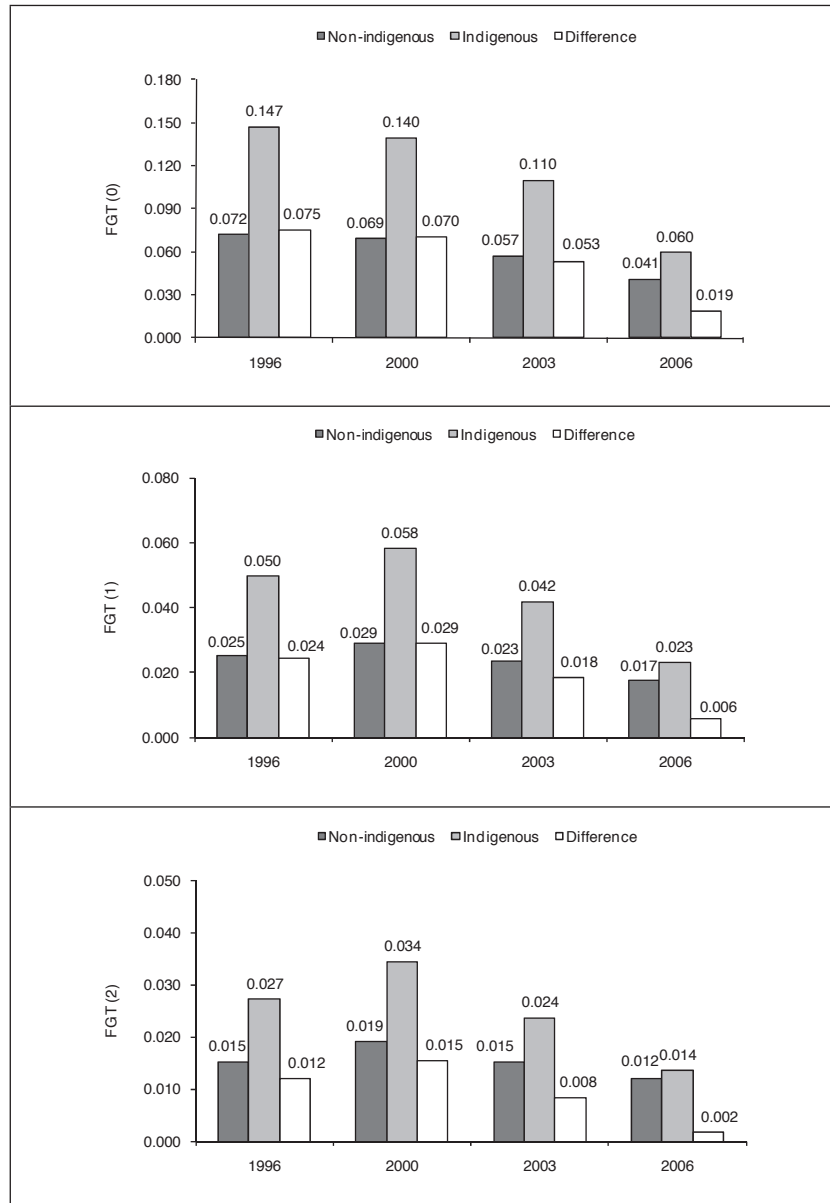
Source: Authors' analysis from CASEN micro-data.

Figure 2: Moderate Poverty Among Indigenous and Non-indigenous in Chile (1996-2006)

Source: Authors' analysis from CASEN micro-data.

to the reduction of poverty among both indigenous and non-indigenous population, it is convenient to compute the growth elasticity of poverty, which can be obtained using the following expression:

$$\varepsilon = \frac{\%\Delta \text{Poverty}}{\%\Delta \text{Per capita income}}$$

First, while growth elasticity of poverty among non indigenous population was -in absolute value- 1.2, the elasticity for indigenous groups was somewhat higher, 1.4, indicating that a 1% increase in per capita income reduced the incidence of absolute moderate poverty by almost 1.5% among indigenous groups, which shows that the reduction of monetary deprivation experienced by indigenous populations is also larger in proportional terms. A second interesting fact is that growth elasticities in 2003-2006 doubled those experienced earlier. In section 4.4 we will comment on the most likely explanation for these facts.

TABLE 2: GROWTH ELASTICITY OF POVERTY REDUCTION, 1996-2006

	1996-2000	2000-2003	2003-2006	1996-2006
Δ % poverty among indigenous population	-8.2	-10,0	-33,6	-45,2
Δ % poverty among non-indigenous population	-11.0	-5,6	-27,1	-38,8
Δ % per capita GDP (in the period)	9,8	6,1	13,2	31,9
Δ % per capita GDP (yearly)	2,4	2,0	4,2	2,8
Growth elasticity of poverty among indigenous population	-0,8	-1,6	-2,5	-1,4
Growth elasticity of poverty among non-indigenous population	-1,1	-0,9	-2,1	-1,2

Source: Authors' analysis from CASEN micro-data and ECLAC data.

The last issue to address in our analysis of monetary deprivation has to do with relative poverty. This measure considers that the minimum life standards are socially constructed, depending therefore on the affluence of the society where you live. As long as Chile has experienced an economic boost along the period 1996-2006, so does the relative poverty line (60% of the median). Figure 3 shows that, unlike non-indigenous population, the progress of indigenous population in terms of relative poverty has been remarkable according to the three FGT indexes considered. For example, while poverty incidence among non-indigenous passed from 26.9 to 25.5%, poverty risk among indigenous groups decreased by roughly 9 points. What can be behind this trend? One should bear in mind that the use a relative measure of poverty is quite like accounting for inequality. It is well-known that inequality in Chile did not experience huge variations during the last years, so it is understandable that relative deprivation among non-indigenous (which accounts for more than 90% of population) did

Figure 3: Relative Poverty Among Indigenous and Non-indigenous in Chile (1996-2006)
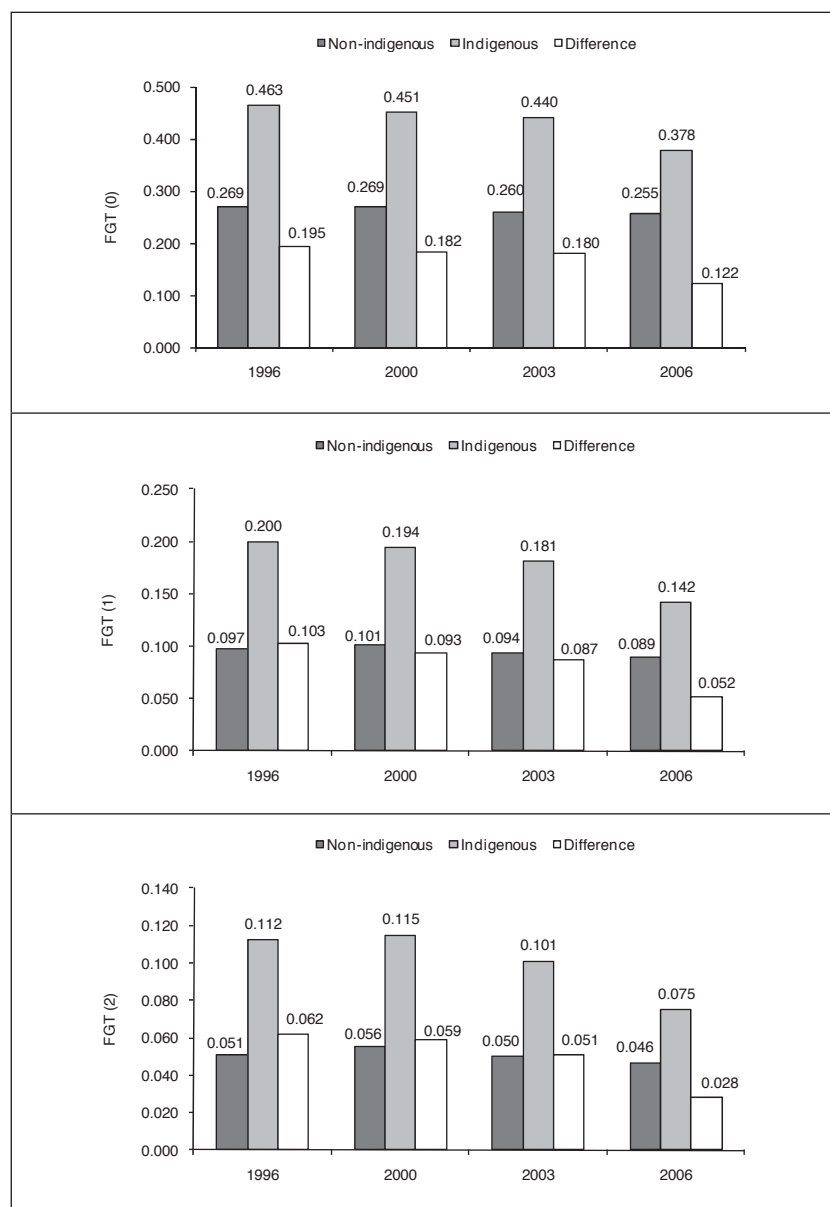
Source: Authors' analysis from CASEN micro-data.

not diminish very much. Nevertheless, the trend in indigenous poverty shows that the improvement of economic position of this group was not only absolute but also relative to the bottom of the income distribution. This can be also confirmed by looking at the distribution of indigenous by deciles of disposable income (figure 4). Again, as one can infer from standard errors reported in the appendix, these trends are statistically significant.

Figure 4: Distribution of Indigenous Population by Income Decile in Chile (1996-2006)
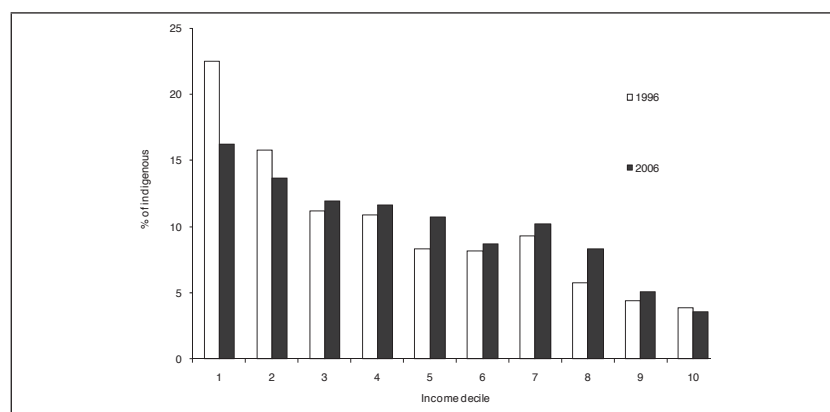
Source: Authors' analysis from CASEN micro-data.

4.2. Unsatisfied basic needs

In an attempt of capturing some other dimensions of poverty apart from the purely monetary one, following the guidelines presented above, this subsection computes the proportion of people by ethnic group living with any kind of unsatisfied basic need. As mentioned, four different dimensions are considered: dwelling quality, water and sewerage, children education and subsistence capacity.

Figure 5 reproduces the proportion of both indigenous and non-indigenous population living in households with each type of unsatisfied basic need. Two stylized facts can be highlighted. First, in all dimensions considered, indigenous population presents worse indicators than non-indigenous individuals and these differences are statistically significant at least at 10%. Second, the gap in deprivation rates expressed in percentual points between both groups decreased from 1996 to 2006, a result that is also statistically significant. Third, the access to adequate water and sewerage and the subsistence capacity of households has substantially improved along the decade 1996-2006. In addition, school attendance among young children is nearly universal, as the proportion of people living in households presenting an UBN in the education

dimension is negligible in 2006 among both collectives. Regarding dwelling, it is particularly interesting that no substantial improvement neither among indigenous nor non-indigenous population has taken place. There is even a slight increase of non-indigenous individuals living in crowded households or low-quality dwellings. In the light of the evident improvement observed in other indicators, this trend seems at least controversial. At this respect, it is worth mentioning that this indicator is built on the basis of questions whose answer is provided by the interviewer according to some guidelines provided by the Ministry.[11] If one goes into detail, this trend can be basically explained by a worse state of walls, floors and roofs according to interviewers' reports. Anyway, it seems quite clear that the improvement observed in the remaining indicators is not a feature characterising the evolution of dwelling quality, which proves to some extent the importance of adopting a multidimensional approach to poverty. This point is discussed in more detail in section 4.4.

Figure 6 presents a simple aggregation of the different UBN, showing what proportion of people had any UBN or two or more UBN along the analysed period. Data are in line with the trends described in the above paragraph: indigenous suffer a higher deprivation according to both indicators and the share of people experiencing deprivation substantially diminished from 1996 to 2006. As in the case of the measures of monetary poverty, the gap between indigenous and non-indigenous in terms of non-monetary deprivation also decreased along the analysed period. Such trends are also statistically significant.

Figure 7 tries to determine to what extent indigenous people has seen their deprivation reduced in proportional terms compared with the rest of Chilean population. During the analysed period, with the exception of water and sewerage, a dimension where non-indigenous experienced a larger improvement, and the proportion of people with two or more UBN, which present a similar reduction among both groups, we find more substantial improvements among indigenous than among the rest of Chileans. However, as shown in figure 5, one should bear in mind that the absolute gap in all dimensions is persistent and non-negligible.

The final step in the analysis of multidimensional deprivation is to combine our non-monetary indicators with those purely derived from household income. The picture described by the integrated method of poverty measurement presented in the previous section is reproduced by figure 8. Particularly, we have used only the moderate poverty line (computed from the absolute perspective of measurement). The results obtained using this approach are not very different from those presented above: the most severe states of deprivation (i.e., chronic and structural poverty) are much more acute among indigenous. However, from 1996 to 2006 there were large improvements in social indicators for both groups, with a better performance of indigenous

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[11] For 2006, see the Interviewer Manual (Mideplan, 2006).

regarding structural poverty. One important lesson that can be drawn from this analysis is that the diminution of deprivation in both groups is much smaller than using only poverty lines methods, though the reduction of the acutest form of material shortage (chronic poverty) was undoubtedly significant.

FIGURE 5: UNSATISFIED BASIC NEEDS BY ETHNIC GROUP IN CHILE (1996-2006) (% WITH THE BASIC NEED UNSATISFIED)
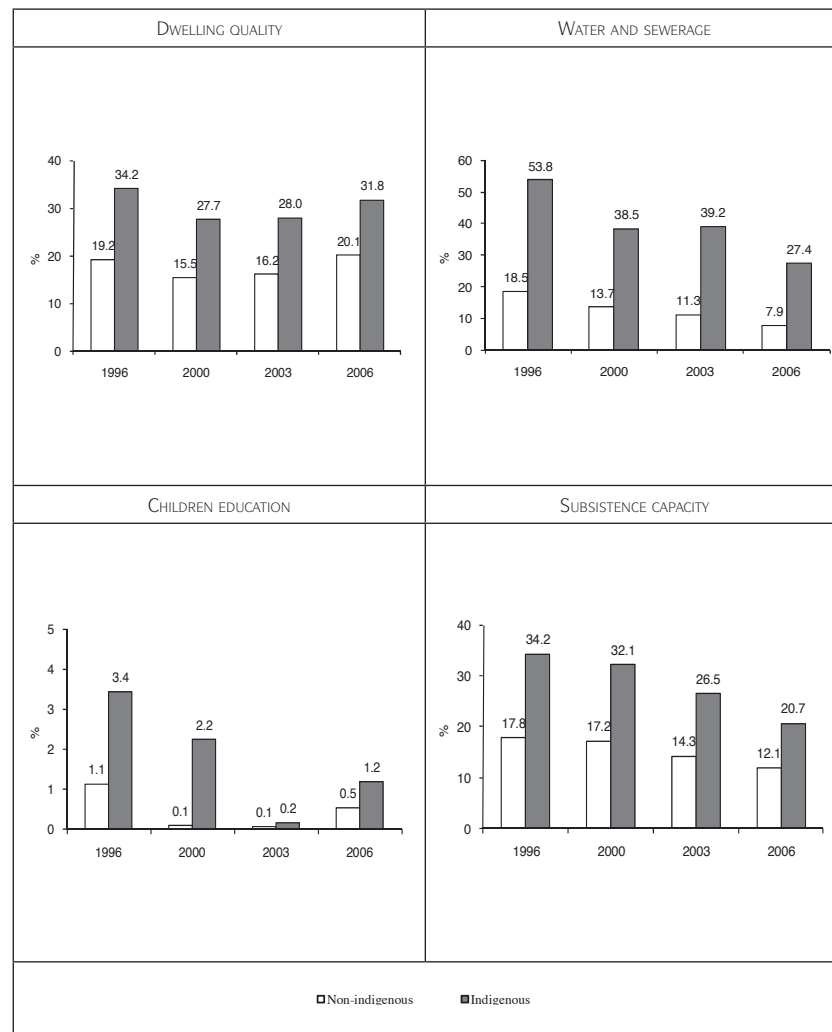
Source: Authors' analysis from CASEN micro-data.

FIGURE 6: Proportion of People with any UBN and Two or More UBN in Chile (1996-2006) (%)
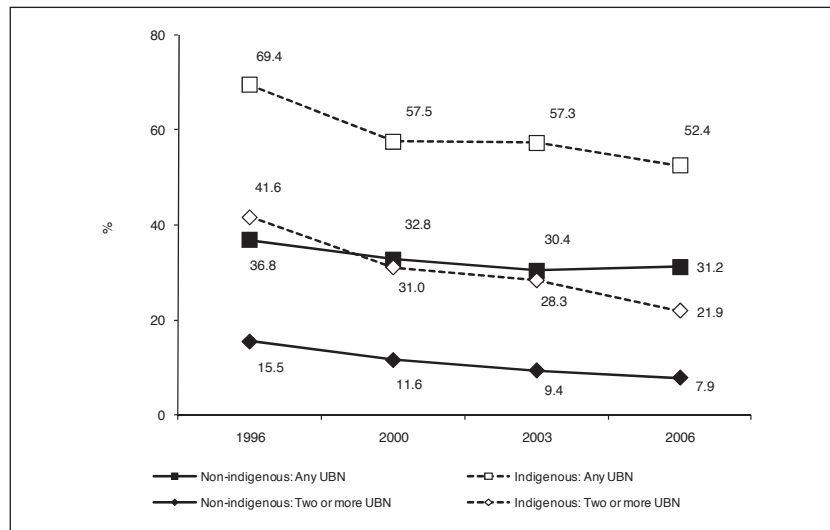
Source: Authors' analysis from CASEN micro-data.

FIGURE 7: Change in the Incidence of UBN by Ethnic Group in Chile (1996-2006) (%)
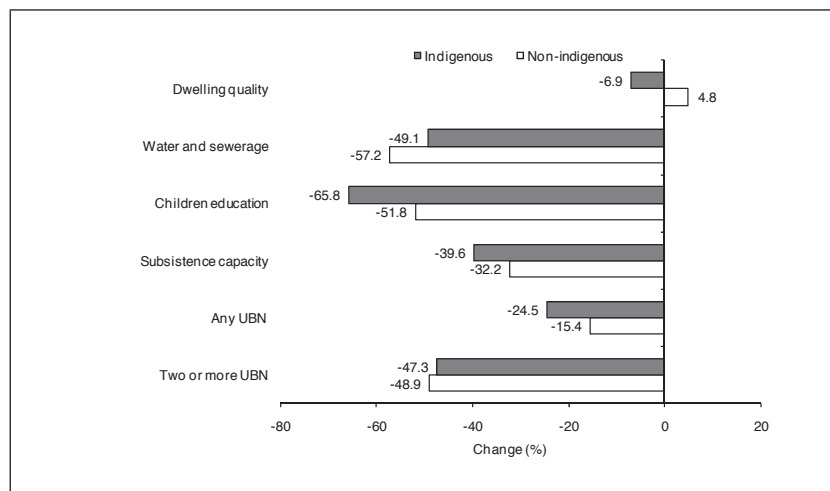
Source: Authors' analysis from CASEN micro-data.

Figure 8: Indicators of Social Deprivation in Chile Combing Poverty Lines and UBN Methods (1996-2006) (% of Population)

Source: Authors' analysis from CASEN micro-data.

4.3. Polarization

This empirical analysis concludes exploring the degree of polarization among ethnic groups observed in Chile, a concept that has to do with the degree of antagonism observed between indigenous groups and the rest of population in terms of income. We make use of the two measures of polarization described in the previous section.[12] The results of this analysis are showed in figure 9. As can be seen, bot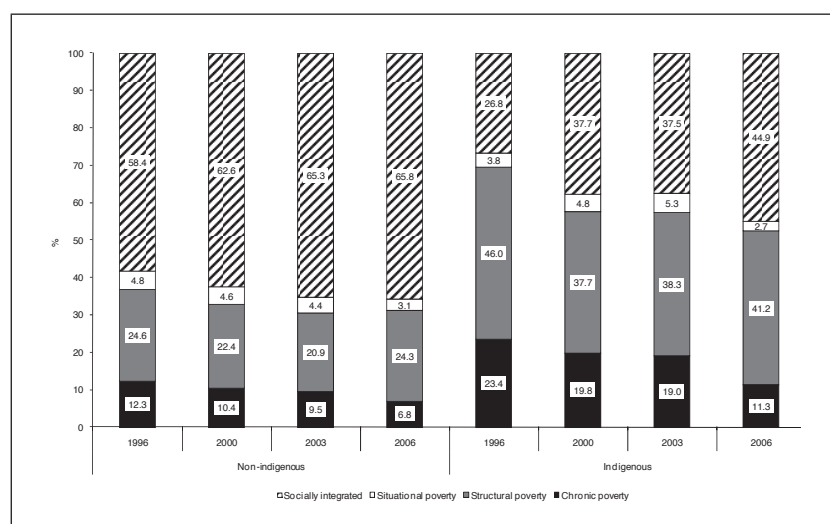h measures show that there was a slight increase of antagonism between indigenous and non-indigenous in Chile during the period 1996-2006. Only the change in the first measure is statistically significant. However, these levels are remarkably low compared with the polarization observed between "rich" and "poor", that is, between the half of total population with an income level below the median and the other half whose income is above that threshold, which are 0.656 and 1.420 in 2006 according to ER and ZK measures, respectively. In order to refine our assessment of economic polarization by ethnicity, we recalculate the index considering only those regions with a proportion of indigenous population above 20% (Regions I, II, IX, X and XII). Surprisingly,

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[12] For reasons of space, regarding the Esteban-Ray index, we only report the results obtained when α -the polarization aversion parameter- equals 1.3. Other values between 1 and 1.6 yielded similar results.

though polarization is now higher, the (slightly) increasing trend vanishes. The ER measure shows no statistically significant change, while the ZK index diminishes (and the reduction is statistically significant at 10% level). Therefore, it is not possible to link polarization to the emergence of conflicts and violence episodes in those regions. It is possible that other kinds of polarizations out from the scope of this article (in terms of wealth or land or even ethnic fragmentation itself or economic polarization computed at a lower level, for instance, at village level) might be relevant.

FIGURE 9: INCOME POLARIZATION AMONG INDIGENOUS AND NON-INDIGENOUS IN CHILE (1996-2006)
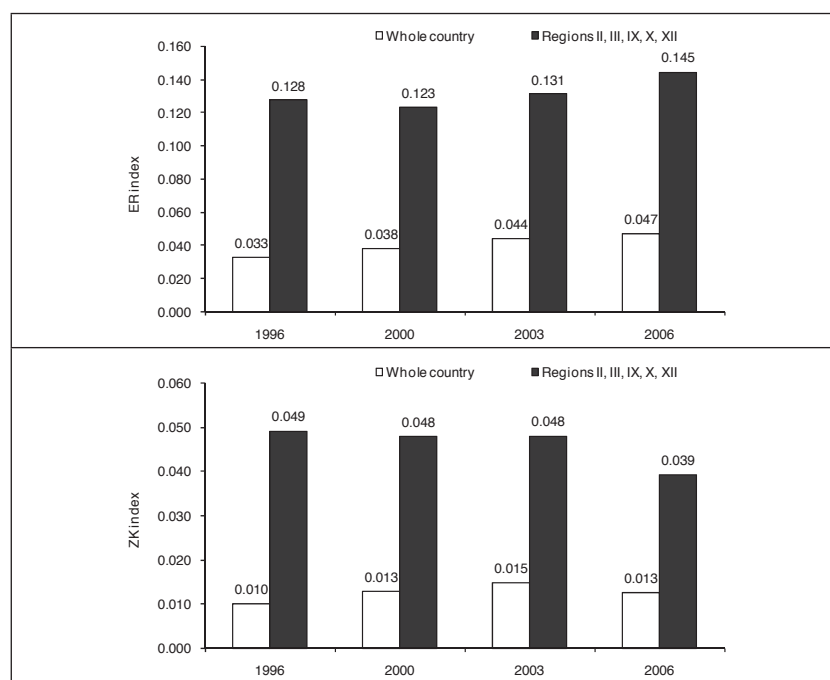
Source: Authors' analysis from CASEN micro-data.

4.4. DISCUSSION

There is a clear and sustained improvement of the situation of indigenous population in Chile, according to both monetary and non-monetary indicators of deprivation. The prime force leading these changes, in a context of relative stability of income distribution, seems to be economic growth. In addition, that remarkable general economic performance was complemented by the extension and improved focalization of social policies in Chile. According to

ECLAC data, although social spending as a percentage of the GDP remained roughly constant around 12% from 1996 to 2006, per capita social spending rose by 22% during the same period. In addition, there was an increasing effort in concentrating subsidies more and more in those population groups that presented larger needs. For example, while the 20% poorest population received 35% of monetary social benefits in 1996, in 2006 such share rose up to almost 50% of subsidies (Mideplan, 2007). This progress in social spending targeting was mainly driven by the development and improvement of the so-called CAS system (acronym of Caracterización Socioeconómica and, currently, renamed as Social Protection system). This system has aimed to identify those families suffering from higher levels of deprivation through visits of Mideplan civil servants to households in order to pick information on their living conditions. It has allowed authorities to target those people suffering from higher deprivation levels (Larrañaga, 2005). In addition, the Chilean government has introduced new poor-oriented programs during the period of interest, like Chile Barrio (which operated from 2001 to 2006), Chile Solidario (which started in 2002) and Chile Emprende (which has been operating since 2004) (Frenz, 2007). Particularly, Chile Solidario, the Government's flagship social program, is a conditional cash-transfer that reached more than 230,000 households and amounted roughly 0.3% of the GDP in 2006. Evaluations of this program showed that it improved the access to health, employment, education and other cash-benefits among poorest people and their results seemed to have been especially positive in rural areas (Raczynski, 2008; Larrañaga, Contreras and Ruíz-Tagle, 2009). Although these programs have no ethnic bias, the higher presence of indigenous in rural areas and among poor population might explain the success of this group in leaving poverty.

Furthermore, the Chilean authorities created several programs specifically focused on indigenous groups in the middle and late-nineties: Fondo de Tierras y Aguas, Fondo de Desarrollo Indígena, Fondo de Cultura y Educación, Programa Orígenes and Beca Indígena. These interventions comprised several social funds whose main aims were to provide training and access to land, training, technical support and agricultural equipment and scholarships aiming to avoid educational system dropout among indigenous children. Although Chile has a well-established policy evaluation culture, these specific policies has not received so much attention from the research community than the policies mentioned above and empirical evidence on the effects of such interventions is more limited. While, for instance, the Fondo de Tierras y Aguas seemed to have a positive effect on indigenous economic situation (Dipres, 2008), other policies, like the Fondo de Desarrollo Indígena (Dipres, 2009a and 2009b) or the Programa Orígenes (Dipres, 2004), have not been so rigorously evaluated.

Nevertheless, the negative evolution of dwelling quality during the last years means a marked exception in this context of overall improvement. This finding, which is supported by other recent study (Libertad y Desarrollo, 2008) deserves further comments. Firstly, it is possible that the reversion in

the positive trend in this indicator during the nineties is somehow associated to the methodological changes in sample design introduced in the 2006 wave. Although authorities argued that comparability is granted, this has been an issue of debate in Chile (Libertad y Desarrollo, 2007). Second, the evolution of dwelling quality might also be related with some worsening in the focalization of housing benefits in the period 2003-2006 highlighted by some authors (Libertad y Desarrollo, 2009). Thirdly, as long as the focalization of social benefits implemented through the CAS system takes into account mainly dwelling quality and households assets, one can speculate with the existence of an incentive for families for not introducing improvements in their buildings.

5. Conclusions

The so called "Indigenous question" has been receiving increasing attention in Latin America during the last decade. However, Chile, the country with the best economic performance during that period, seems to have been a remarkable exception, as few studies have addressed the social and economic situation of aborigines. To our knowledge, this study is the first one in analysing social deprivation among indigenous groups in a systematic way. Our findings point out several interesting facts.

First, indigenous in Chile have experienced and continue suffering clearly higher levels of both monetary and non-monetary deprivation than non-indigenous population.

Second, deprivation indicators have experienced a generalized and steady improvement, with the exception of dwelling quality. On the basis of these results, it cannot be argued that indigenous have been excluded from the economic prosperity experienced by the country along the decade 1996-2006. On the contrary, most of our indicators point out that indigenous population has benefited from larger improvements in living conditions during such period. In general, the reduction of the indigenous-non-indigenous gap is observed both using raw and proportional changes.

Third, income polarization by ethnicity does not seem very important, showing non-increasing levels, especially when compared with polarization by income groups.

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Appendix I

TABLE A1: Poverty Lines in Chile (constant 2006 Chilean pesos)

	Absolute approach				Relative approach
	Rural		Urban		Whole country
	Indigence	Poverty	Indigence	Poverty	Poverty
1996	18,573	32,504	24,104	48,208	45,493
2000	18,348	32,110	23,736	47,659	48,931
2003	18,133	31,733	23,532	47,064	49,527
2006	18,146	31,756	23,549	47,099	57,448
Note: 1 euro = 696.58 pesos (exchange rate, December 2006).					

Source: Authors' analysis from Mideplan data (www.mideplan.cl).

Table A2: Absolute Poverty (detailed statistics)

	1996		2000		2003		2006	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Extreme poverty								
FGT(0)								
Total	0.075	0.002	0.072	0.002	0.060	0.002	0.042	0.001
Non-indigenous	0.072	0.002	0.069	0.002	0.057	0.002	0.041	0.002
Indigenous	0.147	0.013	0.140	0.010	0.110	0.008	0.060	0.005
Difference	0.075	0.014	0.070	0.010	0.053	0.008	0.019	0.005
FGT(1)								
Total	0.026	0.001	0.030	0.001	0.024	0.001	0.018	0.001
Non-indigenous	0.025	0.001	0.029	0.001	0.023	0.001	0.017	0.001
Indigenous	0.050	0.006	0.058	0.006	0.042	0.004	0.023	0.002
Difference	0.024	0.006	0.029	0.006	0.018	0.004	0.006	0.002
FGT(2)								
Total	0.016	0.001	0.020	0.001	0.016	0.001	0.012	0.001
Non-indigenous	0.015	0.001	0.019	0.001	0.015	0.001	0.012	0.001
Indigenous	0.027	0.004	0.034	0.004	0.024	0.003	0.014	0.002
Difference	0.012	0.004	0.015	0.005	0.008	0.003	0.002	0.002
Moderate poverty								
FGT(0)								
Total	0.269	0.005	0.242	0.004	0.223	0.003	0.165	0.003
Non-indigenous	0.263	0.005	0.236	0.004	0.217	0.004	0.161	0.003
Indigenous	0.403	0.019	0.374	0.015	0.333	0.014	0.221	0.009
Difference	0.141	0.019	0.137	0.016	0.116	0.014	0.061	0.009
FGT(1)								
Total	0.096	0.002	0.089	0.002	0.079	0.002	0.056	0.001
Non-indigenous	0.094	0.002	0.087	0.002	0.076	0.002	0.055	0.001
Indigenous	0.153	0.010	0.149	0.008	0.128	0.006	0.075	0.004
Difference	0.060	0.010	0.062	0.008	0.051	0.006	0.020	0.004
FGT(2)								
Total	0.050	0.001	0.049	0.001	0.042	0.001	0.030	0.001
Non-indigenous	0.048	0.001	0.048	0.001	0.041	0.001	0.029	0.001
Indigenous	0.082	0.006	0.085	0.006	0.068	0.004	0.039	0.002
Difference	0.034	0.007	0.037	0.006	0.028	0.004	0.009	0.003

Source: Authors' analysis from CASEN micro-data.

Table A3. Relative poverty (detailed statistics)

	1996		2000		2003		2006	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Extreme poverty								
FGT(0)								
Total	0.076	0.002	0.083	0.002	0.074	0.002	0.067	0.002
Non-indigenous	0.071	0.002	0.079	0.002	0.070	0.002	0.064	0.002
Indigenous	0.178	0.017	0.174	0.011	0.156	0.009	0.109	0.006
Difference	0.107	0.017	0.096	0.011	0.086	0.009	0.045	0.006
FGT(1)								
Total	0.027	0.001	0.034	0.001	0.029	0.001	0.026	0.001
Non-indigenous	0.026	0.001	0.032	0.001	0.027	0.001	0.025	0.001
Indigenous	0.063	0.007	0.074	0.006	0.059	0.005	0.040	0.003
Difference	0.037	0.007	0.042	0.006	0.032	0.005	0.015	0.003
FGT(2)								
Total	0.016	0.001	0.022	0.001	0.018	0.001	0.016	0.001
Non-indigenous	0.015	0.001	0.021	0.001	0.017	0.001	0.015	0.001
Indigenous	0.033	0.004	0.044	0.005	0.033	0.003	0.022	0.002
Difference	0.018	0.004	0.023	0.005	0.016	0.003	0.007	0.002
Moderate poverty								
FGT(0)								
Total	0.277	0.005	0.277	0.005	0.270	0.004	0.263	0.004
Non-indigenous	0.269	0.005	0.269	0.005	0.260	0.004	0.255	0.004
Indigenous	0.463	0.019	0.451	0.016	0.440	0.014	0.378	0.010
Difference	0.195	0.020	0.182	0.017	0.180	0.014	0.122	0.011
FGT(1)								
Total	0.102	0.002	0.105	0.002	0.098	0.002	0.093	0.002
Non-indigenous	0.097	0.002	0.101	0.002	0.094	0.002	0.089	0.002
Indigenous	0.200	0.011	0.194	0.009	0.181	0.007	0.142	0.005
Difference	0.103	0.011	0.093	0.009	0.087	0.007	0.052	0.005
FGT(2)								
Total	0.053	0.001	0.058	0.001	0.053	0.001	0.048	0.001
Non-indigenous	0.051	0.001	0.056	0.001	0.050	0.001	0.046	0.001
Indigenous	0.112	0.008	0.115	0.007	0.101	0.005	0.075	0.003
Difference	0.062	0.008	0.059	0.007	0.051	0.005	0.028	0.003

Source: Authors' analysis from CASEN micro-data.

Table A4: Unsatisfied Basic Needs (detailed statistics)

	1996		2000		2003		2006	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Dwelling quality								
Non-indigenous	0.192	0.005	0.155	0.003	0.162	0.003	0.201	0.004
Indigenous	0.342	0.015	0.277	0.016	0.280	0.011	0.318	0.011
Difference	0.149	0.016	0.121	0.016	0.118	0.011	0.117	0.011
Water and sewerage								
Non-indigenous	0.185	0.005	0.137	0.003	0.113	0.002	0.079	0.002
Indigenous	0.538	0.021	0.385	0.017	0.392	0.012	0.274	0.011
Difference	0.353	0.022	0.248	0.017	0.279	0.013	0.194	0.011
Children education								
Non-indigenous	0.011	0.001	0.009	0.001	0.001	0.000	0.005	0.001
Indigenous	0.034	0.005	0.022	0.003	0.002	0.001	0.012	0.002
Difference	0.023	0.005	0.013	0.003	0.001	0.001	0.006	0.002
Subsistence capacity								
Non-indigenous	0.178	0.004	0.172	0.003	0.143	0.003	0.121	0.002
Indigenous	0.342	0.018	0.321	0.015	0.265	0.010	0.207	0.008
Difference	0.165	0.019	0.149	0.015	0.122	0.010	0.086	0.008
Any UBN								
Non-indigenous	0.368	0.006	0.328	0.005	0.304	0.004	0.312	0.004
Indigenous	0.694	0.020	0.575	0.019	0.573	0.014	0.524	0.011
Difference	0.326	0.021	0.247	0.020	0.269	0.014	0.213	0.012
Two or more UBN								
Non-indigenous	0.155	0.005	0.116	0.003	0.094	0.002	0.079	0.002
Indigenous	0.416	0.019	0.310	0.015	0.283	0.010	0.219	0.009
Difference	0.261	0.020	0.194	0.015	0.189	0.010	0.140	0.009
Chronic poverty								
Non-indigenous	0.122	0.004	0.104	0.003	0.095	0.002	0.068	0.002
Indigenous	0.234	0.017	0.198	0.011	0.190	0.010	0.112	0.006
Difference	0.112	0.017	0.094	0.011	0.095	0.010	0.044	0.006
Structural poverty								
Non-indigenous	0.246	0.004	0.224	0.004	0.209	0.003	0.243	0.004
Indigenous	0.460	0.017	0.377	0.015	0.383	0.012	0.412	0.011
Difference	0.214	0.018	0.153	0.015	0.174	0.013	0.169	0.012
Situational poverty								
Non-indigenous	0.048	0.002	0.046	0.002	0.044	0.002	0.031	0.001
Indigenous	0.038	0.010	0.048	0.007	0.053	0.012	0.027	0.003
Difference	-0.009	0.010	0.002	0.007	0.009	0.012	-0.004	0.004
Socially integrated								
Non-indigenous	0.584	0.006	0.626	0.006	0.653	0.004	0.658	0.005
Indigenous	0.267	0.019	0.377	0.020	0.375	0.014	0.449	0.011
Difference	-0.316	0.020	-0.249	0.020	-0.278	0.014	-0.209	0.012

Source: Authors' analysis from CASEN micro-data.

TABLE A5: POLARIZATION (DETAILED STATISTICS)

	1996		2000		2003		2006	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
ER index								
Whole country	0.033	0.003	0.038	0.002	0.044	0.002	0.041	0.002
Regions II, III, IX, X, XII	0.128	0.006	0.123	0.007	0.131	0.007	0.114	0.005
ZK index								
Whole country	0.010	0.002	0.013	0.001	0.015	0.001	0.013	0.001
Regions II, III, IX, X, XII	0.049	0.004	0.048	0.005	0.048	0.004	0.039	0.003

Source: Authors' analysis from CASEN micro-data.