

POVERTY AND INCOME DISTRIBUTION IN CHILE
1987-1998. NEW EVIDENCE*DANTE CONTRERAS, OSVALDO LARRAÑAGA
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ABSTRACT

This paper presents an update on the poverty and income distribution situation in Chile during the 90s. The analysis shows unambiguously that there was less poverty between 1994 and 1998 than in all earlier years, whether poverty is measured by the headcount, the poverty deficit or by any of the most sensitive poverty indices. The evidence also confirms that income inequality in Chile remains high by international standards. Nevertheless, notwithstanding the earlier observation, the overall picture on inequality is one of a fairly stable distribution for the period as a whole, with changes in income shares being relatively small in proportion to the size of the shares themselves.

In addition, this study develops and applies a methodology for the estimation of the imputed income transfers from government subsidies in health, education, and housing, for the years 1990, 1994, 1996 and 1998. The analysis has confirmed that adjustments for in-kind income transfers substantially reduce the Gini coefficient on income inequality. For 1998, this coefficient falls from 0.56 (unadjusted) to 0.50 (adjusted) and the ratio of the highest (richest) to the lowest (poorest) quintile falls from 20 to 11. These results suggest that social policies in Chile have had a significant impact in reducing income inequality, in spite of the fact that such policies are oriented towards poverty reduction rather than reduction in inequality per se.

* This paper is based on the World Bank report (2000). This report was prepared by a team led by Alberto Valdes and consisting of Julie Litchfield (University of Sussex, UK), Osvaldo Larrañaga, Dante Contreras, Isabel Millan and David Bravo (Universidad de Chile, Santiago). The valuable comments of Aristides Torche, Norman Hicks and Paul Levy are gratefully acknowledged. The usual disclaimer applies.

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The study also presents a quantitative assessment of the "deficit" in health, education, and housing status between the years 1990 and 1998, by comparing the access to these services with various thresholds based on widely accepted standards in each area. Based on a number of indicators, the study documents the educational, health, and housing status during these two years, and presents comparative estimates of the current deficits in each of these three areas in 1990 and 1998.

Overall, the study confirms the critical importance of achieving high growth and constant appraisal of the current social policies. There is no question that Chile's growth and social policies were successful in reducing the incidence and intensity of poverty.

RESUMEN

Este trabajo presenta un panorama de la situación de pobreza y distribución del ingreso en Chile durante los años 90s. Se muestra que entre 1994 y 1998 la pobreza fue más baja respecto de períodos anteriores, sea medida por el porcentaje de pobres, el déficit de pobreza o cualquier otra medida apropiada. La evidencia muestra que la desigualdad de ingresos sigue siendo elevada para los estándares internacionales, y que la variable se ha mantenido relativamente estable durante el período bajo análisis.

El trabajo también desarrolla y aplica una metodología para imputar las transferencias gubernamentales en salud, educación y vivienda en sus equivalentes monetarios para los años 1990, 1994, 1996 y 1998. El ingreso resultante muestra menor desigualdad que el ingreso monetario, con una reducción del Gini de 0.56 a 0.50 y de la razón de quintiles de 20 a 11. Estos resultados sugieren que la política social en Chile ha sido importante para reducir la desigualdad, a pesar de que se trata de políticas más orientadas a la reducción de la pobreza.

El estudio también presenta una estimación del "déficit" en salud, educación y vivienda durante los años 1990 y 1998, a partir de comparar el acceso a estos servicios respecto de umbrales relevantes. Basado en un conjunto de indicadores, se evalúa la evolución de estos déficits en el período citado.

En términos generales, el estudio confirma la contribución crítica que ha tenido el crecimiento económico y un conjunto de políticas sociales apropiadas para reducir la incidencia e intensidad de la pobreza en Chile.

INTRODUCTION

In 1997 a World Bank report entitled “Chile: Poverty and Income Distribution in a High-Growth Economy: 1987-1995” concluded that the high GDP growth rates achieved by Chile during the late 1980s and early 1990s had contributed unambiguously to a considerable reduction in poverty, in terms of incidence, depth and severity. The incidence of indigence fell from 13% in 1987 to a mere 4% by 1994, and the headcount estimate showed that the population that lived in poverty fell from 41% in 1987 to 17% by 1994. The 1997 report also confirmed that declining poverty was strongly and positively related to high economic growth. This reduction in poverty during 1987-94 benefited almost all groups classified as vulnerable at the beginning of the period.¹

On the other hand, the broad picture of income distribution that arises from the 1997 report was that of a stable distribution during the period. More specifically, the findings on income distribution can be characterized by three observations: (i) the entire distribution function had shifted to the right, with nearly everybody earning more in the same relative ranks; (ii) the dispersion of the distribution remained broadly stable as it moved to the right during the period and, if anything, there was a slight reduction in overall inequality; and (iii) there was a slight compression in the lower tail and a slight stretching in the upper tail (suggesting that inequality among the poor declined, while inequality among the very rich increased).

The present study has three main objectives. *Firstly*, to present an update of the poverty and income distribution measures reported in the World Bank 1997 study, for the period 1987-1998 using the same sampling methodology and survey questions as in that report. *Secondly*, to incorporate social services in the measurement of income distribution and poverty. *Thirdly*, to present an analysis of non income socio-economic indicators between 1990 and 1998. The incorporation of social services follows the recognition that most of what the government can control to assist the poor is related to social spending, and such spending is mainly channeled through education, health, and housing. Thus the importance of monitoring the evolution of various indicators which are directly influenced by social policies, in addition to the traditional money-metric indicators.

The quantitative assessment of the impact of social programs on income distribution during 1990–1998 requires the development of a methodology to assess the imputed income equivalent values from the in-kind transfers (via government programs in education, health, and housing). These amendments are applied at the household level based on the CASEN surveys.

On the other hand, to incorporate social services in the measurement of poverty the study: (a) presents a set of indicators to measure the lack of access to education, health, and housing based on the CASEN data for 1998 and, (b) analyzes

¹ See also Contreras (1996), Contreras (1999), Larrañaga (1994.b), Larrañaga (1999).

the trends in several non-income poverty indicators between 1990 and 1998, specifically education, health, and housing.

1. POVERTY AND INCOME DISTRIBUTION: A STATISTICAL OVERVIEW FOR THE PERIOD 1987–98

The aim of this section is to provide a comprehensive picture of the levels and trends in poverty and income inequality in Chile between 1987 and 1998. It contains an examination of how rapid economic growth and social policies have affected the poverty, welfare and distribution of income in Chile since 1987.

The empirical foundations of the analysis

This study uses information comprising six household survey micro-data sets—the Caracterización Socioeconómica Nacional (CASEN) for the years 1987, 1992, 1994, 1996 and 1998.² CASEN is a nationally and regionally representative household survey with a sample size of 48,588 households (in 1998).

The CASEN survey is carried out on a biannual basis by the Ministerio de Planificación Nacional, MIDEPLAN, through the Department of Economics at the Universidad de Chile in Santiago. The sampling methodology can be described as multi-stage random sampling with geographical stratification and clustering. Once each survey is completed, the data are entrusted to CEPAL (The UN Economic Commission for Latin America and the Caribbean) in Santiago to make adjustments for non-response, missing income values, and the under (or over) reporting of different income categories, with the National Accounts System being used as a reference.

In this study several additional adjustments have been applied to the data from earlier work based on the CASEN. Some of the adjustments lead to higher poverty estimates while others to lower. Thus, our analysis relies on household income per equivalent adult (rather than simple per capita income) as the chosen income indicator, and reports the proportion of individuals (rather than households) below the poverty line. Differences in average price levels across the different regions of Chile as well as for live-in servants are also corrected. Unlike most analysis on the basis of this data, no adjustment has been made to lower the poverty line in rural areas due to unmeasured prices.

Adjusted total household income is the income variable used and includes all primary income in cash and in-kind transfers, monetary transfers (such as family allowance, assistance pensions, family subsidies, water subsidies and

² The resulting panel data set is unbalanced in the sense that one does not observe the same sample in each year, but each of the samples is representative for that year.

unemployment subsidies), as well as imputed rents and gifts. This measure does not, however include the value of in-kind transfers made to households by the government through education, health, and housing programs. Therefore, these measures of per capita income exclude the values of these services, especially to low-income families, and therefore underestimate the income of the beneficiaries of these government programs. Adjustments for these in-kind transfers are presented in section 2.

Key social indicators

As a complement to these poverty measures, social indicators that provide other direct measures of welfare for the poorest segments of society are presented below (Table 1). A more detailed analysis of social indicators for Chile is available in publications by MIDEPLAN, and a comprehensive analysis is found in the Human Development Report, published annually by the UNDP.

While there is no room for complacency, the evidence indicates that Chile has made considerable improvements in key social indicators such as infant mortality, life expectancy, coverage of primary and secondary education, and in housing. Mean labor income and labor force participation have also increased, particularly for women. However, the rate of unemployment has also increased reaching 10% in 1998 after having been at half that rate for several years, a situation that is attributed to the economic slowdown associated with the Asian crisis and to events in Brazil and other countries. By mid-2000, this relatively high unemployment rate has persisted at about 10%, and has led to a major concern and controversy concerning a current government labor reform proposal.

The evolution of poverty

Three (absolute) poverty lines were used in computing poverty measures, all of them expressed in 1998 pesos. These were: the indigence line, a lower-bound poverty line, and an upper-bound poverty line. The first two official measures are widely used in Chile. For each poverty line, three poverty measures are reported. The simplest and most common measure is the *headcount index* (the proportion of individuals with income below the poverty line). It does not indicate the depth of poverty, nor does it indicate whether a person below the poverty line becomes relatively poorer. The second measure is the *poverty deficit index* (an aggregate of the income shortfalls of the poor relative to the poverty line, divided by the population size). This measure essentially reflects the depth of poverty. A family that is barely below the poverty line adds only a little to the poverty gap index, but a family that is destitute adds a great deal. The third indicator is the Foster-Greer-Thorbecke-2 (FGT-2) index, which provides a distribution-sensitive measure that gives a greater weight to larger shortfalls, and thus is more sensitive to extreme poverty.

TABLE 1
KEY SOCIAL INDICATORS

	1990	1998
Population	12.852.423	14.556.797
Education		
Primary education coverage (%)	96.8	98.3
Secondary education coverage (%)	80.5	86.9
Illiteracy (% , older than 15)	3.7	4.6
Housing		
% of dwellings without deficit (building materials, crowding or infrastructure)	57.2	72.7
Health		
Life expectancy (yrs.)	72.0	---
Infant mortality rate (per '000)	16.0	10.0
Labor Market Statistics		
Unemployment rate (%)	8.4	10.0
Participation in labor force: men (%)	73.6	74.6
Participation in labor force: women (%)	31.3	38.1
Average years schooling for workers (yrs.)	9.8	10.5
Employment index	100.0	115.5
Mean real labor income index	100.0	155.0
% wage earners in labor force	75.8	77.7

Source: Calculations based on 1990 and 1998 CASEN surveys (except health statistics).

The data indicates that the trend of falling poverty, in terms of incidence, depth and severity, continued through to 1998 (Table 2). The proportion of people in poverty continued to fall as reported by the dramatic reduction in the headcount poverty measure. The two other indices also decreased substantially, regardless of the poverty line used. In contrast to the fluctuating trends in inequality (discussed below) poverty has followed a downward trend for almost the entire period of 1987-98, but after 1994 poverty levels fell at slower rates than during the years of rapid growth (1987-92).

Based on the standard poverty line used in Chile, the headcount measure shows that poverty fell from 23.1 % in 1994 to 17.0% in 1998. Extreme poverty (indigence) fell from 5.1% in 1994 to 3.9% in 1998. The analysis shows that there was unambiguously less poverty between 1996 and 1998 than in all earlier years, whether poverty is measured by the headcount, the poverty deficit or by any of the most sensible poverty indices. This sort of unambiguous poverty reduction, across such a large range of different poverty measures, is not commonly observed in Latin America or in other regions for that matter.

TABLE 2
POVERTY MEASURES: HOUSEHOLD INCOMES PER EQUIVALENT ADULT

	1987	1990	1992	1994	1996	1998
Indigence Line:	P\$ 18,944					
Headcount	12.7	9.0	4.7	5.1	4.2	3.9
Poverty Deficit	4.1	3.1	1.7	2.0	1.5	1.5
FGT (2)	2.1	1.8	1.1	1.2	0.9	0.9
Poverty Line L:	P\$ 37,889					
Headcount	40.0	33.1	24.2	23.1	19.9	17.0
Poverty Deficit	15.7	12.0	7.8	7.6	6.5	5.7
FGT (2)	8.2	6.1	3.8	3.8	3.2	2.9
Poverty Line H:	P\$ 43,004					
Headcount	47.3	38.9	30.0	29.0	24.6	21.2
Poverty Deficit	19.1	14.8	10.1	9.8	8.4	7.3
FGT (2)	10.3	7.8	4.9	5.0	4.1	3.7

Source: Own calculations from CASEN 1987-1998. Incomes are monthly incomes and are expressed in 1998 pesos.

The reductions observed in poverty are also valid at the decile level. Mean incomes per decile (in terms of household income per equivalent adult) increased unambiguously for all decile levels. Yet, although the headcount indicates a reduction in the number of poor people, the real income of the very poorest 2 to 3 % of the population fell between 1996 and 1998. However, this result is somewhat hard to interpret because these small changes occur in the very extreme tail of the distribution where income data is likely to be more unreliable.

Trends in inequality

If the relative gains (and losses) over the period are examined, the overall impression is again one of a fairly stable distribution for the period as a whole, with changes in shares being relatively small in proportion to the size of the shares themselves (Table 3). However, as shown in Table 4, a slight rise in inequality since 1996 can be seen. For example, the Gini coefficient fell slightly between 1987 and 1994 but again reached the 1987 level by 1998 (from 0.5468 in 1987 to 0.5298 in 1994 and from 0.5409 in 1996 to 0.5465 in 1998). Between 1996 and 1998, the four measures of inequality do indicate that 1996 had lower inequality levels than 1998. However, the order of magnitude of the differences between coefficients is extremely small. In fact, in the case of the Gini coefficient, this difference barely represents a one-percent rise.

TABLE 3
INCOME SHARES PER DECILE: HOUSEHOLD INCOMES
PER EQUIVALENT ADULT

Decile	1987	1990	1992	1994	1996	1998
1	1.34	1.39	1.52	1.43	1.40	1.30
2	2.41	2.57	2.6	2.57	2.44	2.37
3	3.17	3.33	3.38	3.36	3.25	3.18
4	3.97	4.19	4.16	4.18	4.07	4.02
5	4.88	5.14	5.04	5.14	5.01	4.95
6	6.04	6.28	6.16	6.33	6.17	6.12
7	7.66	7.92	7.73	7.93	7.80	7.79
8	10.24	10.39	10.16	10.55	10.38	10.32
9	15.71	15.51	14.82	15.76	15.45	15.50
10	44.58	43.28	44.43	42.73	44.05	44.43
Top 1%	12.02	12.35	13.68	12.41	12.70	13.22

Source: own calculations from CASEN 1987-1998.

TABLE 4
DESCRIPTIVE STATISTICS: HOUSEHOLD INCOMES PER
EQUIVALENT ADULT

	1987	1990	1992	1994	1996	1998
Mean	84,628	94,414	114,290	118,298	133,476	149,289
Median	45,648	53,440	63,204	66,960	74,043	81,809
Gini	0.5468	0.5322	0.5362	0.5298	0.5409	0.5465
E(0)	0.5266	0.4945	0.4891	0.4846	0.5139	0.5265
E(1)	0.6053	0.5842	0.6151	0.5858	0.6058	0.6264
E(2)	1.3007	1.3992	1.505	1.5634	1.4123	1.6172

Notes: author's own calculations from CASEN 1987-1998.

Incomes are monthly incomes and are expressed in 1998 pesos.

These small changes between years and between the beginning and end years are not statistically significant, with the exception of the statistically significant increase in inequality observed between 1996 and 1998.³ Between these two years there was an increase in dispersion within both the top and the bottom of the income distribution (e.g. rise in both E(0) and E(2) measures). It is too early to determine whether this is a temporary deviation from a previously stable path or whether this is the beginning of an upward trend. While the change is statistically significant, it does not represent a substantial increase in inequality and it occurred in the context of rising living standards and falling poverty.

The poverty and inequality analysis was also extended to allow for a comparison between rural and urban areas. The total rural population represented approximately 20% in 1987 but fell to just under 15% by 1998. A disaggregated

³ Tests are reported in World Bank (2000).

examination of rural and urban differences indicates that both urban and rural areas experienced strong increases in mean incomes during the period 1987 to 1998, although incomes in urban areas rose proportionally slightly more than in rural areas. This faster rate of growth in urban areas led to a very slight widening of the income gap between urban and rural areas.

2. IMPACT OF SOCIAL POLICIES ON INCOME DISTRIBUTION, 1990-98

The income data presented in the previous section did not include the value of in-kind transfers to households by the government through programs in education, health, and housing. These transfers, it is argued, reduce the constraints on household budgets, freeing income for the consumption of other goods and services. Hence, the omission of such in-kind transfers, one would expect, would overstate the level of both poverty and income inequality in Chile, considering that the impact of such social programs over total household income is likely to be (both absolutely and proportionally) significantly higher for low income families.

The policy issue of what is the implicit income transfer equivalence of social programs has drawn the attention of several Chilean economists in the recent past. The key questions that previous authors addressed were (i) what has been the impact of social programs in alleviating poverty, (ii) how well targeted are social programs, and (iii) what has been the impact of such programs in reducing income inequality, as measured for example by the Gini coefficient? Studies by MIDEPLAN (1996), de Gregorio and Cowan (1996), Scholnick (1996), Larrañaga (1994.a), and Contreras, Bravo and Millan (2000) presented preliminary estimates of imputed income transfers for some social programs based on a specific year of the CASEN survey and reported comparisons of the income situation of the higher and lower quintiles with and without adjustments for in-kind transfers.

These studies were extremely useful in (a) indicating that this particular adjustment could result in substantially lower Gini coefficients, and (b) raising a number of conceptual and measurement issues, which have facilitated the work for this report. However, these very valuable contributions were restricted to the analysis of the income distribution by quintiles (and not at the percentile level) and in most cases for only one year, thus not providing an overview on the evolution of the indicators (with/without adjustments) required to test the changes in the impact of such policies through time. Furthermore, in these previous studies, the analysis did not present a regional perspective regarding the differential impact of social programs throughout the various regions.

This study develops and applies a methodology for the estimation of the imputed income transfers from government subsidies in health, education, and housing based on the information collected by the CASEN survey, and applies this methodology for the years 1990, 1994, 1996 and 1998. Because of lack of data it was not possible to extend the analysis to 1987. In contrast to the previous studies, in this study the imputed values are assigned to each individual household

based on the information of services actually received by the members of that household.

Measuring the implicit income transfer from social programs raises several complex conceptual and empirical issues. Should a one-to-one relationship between monetary income and the implicit income transfer be assumed? Or do the recipients of such transfers value them less than their monetary cost to the government? Are there substantial leakages in social expenditures towards non-poor groups and/or high delivery costs so that the actual transfer received by households is only a fraction of the cost of the programs in question?

Which subsidies were included?

In these estimates, the individual's autonomous income (per adult equivalent) was adjusted for the imputed value (income transfer) of the following government programs and income estimates: monetary transfers, imputed rental value of his privately-owned house, implicit transfer (net of co-payments) for health, education, and housing. The same criteria for the valuation of these transfers was applied through the time period considered. The health, education and housing programs include many different types of benefit. To estimate the imputed values, we undertook a detailed analysis of the various sub-components of each program and developed a valuation criterion. Then the corresponding monthly subsidy received by each member of the household was computed according to the frequency and type of service used. For example, 17 health categories were identified, such as surgery, dental services, laboratory tests, preventive check-ups, X-rays, emergency services, hospital expenses net of the above, etc. and, for each of these categories, average monthly values were estimated. In education, more than 25 sub-components were identified with their corresponding valuation criteria. For housing, six sub-components were defined and valued.

The valuation criteria are discussed in detail in World Bank (2000). In education, the basic funding sources considered were the school meals program, pre-school programs under Junta Nacional de Jardines Infantiles, JUNJI, and INTEGRA, contributions from Ministerio de Educación, MINEDUC, the budget transfers to municipal and private subsidized schools in primary, secondary and special education, government budget allocations for school books and equipment, special teachers post-graduate training programs, Junta Nacional de Auxilio Escolar y Becas, JUNAEB, scholarships, and several others. In health, the public health insurance program was included, as well as the 2% contribution to Instituciones de Salud Previsional, ISAPRES, maternity leave, the Programa Nacional de Alimentación Complementaria, PNAC program, and others, net of co-payments.

What has been confirmed?

The analysis has confirmed that adjustments for in-kind income transfers substantially reduce the Gini coefficient on income inequality (Table 5). For 1998

this coefficient falls from 0.56 to 0.50, and the ratio of the highest (richest) to the lowest (poorest) quintile falls from 20 to 11. A substantial reduction in inequality is also observed when applying alternative indicators, namely the Theil Index, a transformation of the coefficient of variation, and the mean log variation coefficient. This reduction in inequality is robust to downward changes of the parameters which value the benefits received.

These results suggest that social policies in Chile have had a significant impact in reducing income inequality, in spite of the fact that such policies are oriented towards poverty reduction rather than the reduction of inequality per se. Moreover, the analysis concludes that the impact of social policies was more significant in 1998 than 1990. This resulted primarily from the significant increase in the budget allocation to such programs between 1990 and 1998, rather than from better targeting or lower delivery costs.

TABLE 5
INCOME DISTRIBUTION INDICATORS ADJUSTED FOR IN-KIND
TRANSFERS, CHILE 1998

Indicator	A Monetary Income	B A + Health	C A + Education	D A + Cash Transfers	E A + Housing	G Total (A+B+C+D+E)
Q1	3.06	3.76	4.18	3.36	3.13	5.16
Q2	6.68	7.14	7.55	6.88	6.75	8.20
Q3	10.81	10.99	11.31	10.89	10.87	11.60
Q4	18.31	18.12	18.24	18.25	18.35	18.02
Q5	61.14	59.99	58.71	60.62	60.90	57.02
Q5/Q1	20	16	14	18	19.5	11.1
Atkinson Coefficient	0.689	0.570	0.551	0.631	0.664	0.451
Theil	0.655	0.621	0.586	0.639	0.649	0.540
Log(P90/P10)	2.55	2.34	2.21	2.46	2.52	1.99
Log Variance	1.104	0.898	0.823	1.001	1.032	0.663
Gini	0.5644	0.5460	0.5259	0.5563	0.5616	0.5028

TABLE 6
AVERAGE VALUE IN 1998 PESOS OF SOCIAL SUBSIDY PROGRAMS BY
QUINTILE, CHILE 1998 (IN '000s)

Indicator	Monetary Income	Cash Transfers	Health	Education	Housing	Total Social Transfers
Q1	19.0	2.3	4.9	9.2	0.6	17.0
Q2	41.5	1.5	3.8	7.5	0.6	13.4
Q3	67.2	1.0	2.5	6.3	0.8	10.6
Q4	113.9	0.6	0.7	4.9	0.8	6.9
Q5	380.1	0.2	-0.3	2.8	0.6	3.3
Average	124.3	1.1	2.3	6.1	0.6	10.2

Of the various social programs considered, as shown in Table 6, subsidies to education were the main contributors to the reduction in inequality (59.9% of total transfers), followed by health (25.5%), monetary transfers (11.1%) and housing (6.5%).

In terms of the impact of social programs on the reduction of inequality at the regional level for the period 1990-1998 (not shown in the text), the picture that emerges from the quantitative analysis suggests that the results are sensitive to the particular year, varying in their relative effect through time. However, overall, in terms of the reduction in inequality, we can conclude that social programs did have a more significant impact in Metropolitan Santiago and most other regions, but had no significant effect in Regions VIII and XI.

TABLE 7
TREND IN AVERAGE SUBSIDIES PER CAPITA BY PROGRAMS,
CHILE 1990-98

	Average per capita In Nov. 1998 pesos				As percentage of total			
	1990	1994	1996	1998	1990	1994	1996	1998
Net income	83,665	105,212	115,917	124,335				
Cash transfers	708	706	1,065	1,135	15,8	10,7	11,5	11,1
Health	997	2,973	2,936	2,299	22,2	31,3	31,7	22,5
Education	2,459	3,443	4,699	6,125	54,8	52,0	50,7	59,9
Housing	320	393	576	666	7,1	5,9	6,2	6,5
Total social transfers	4,483	6,615	9,277	10,225	100,0	100,0	100,0	100,0

Source: authors calculations based on CASEN surveys.

3. INCORPORATING SOCIAL SERVICES IN THE MEASUREMENT OF POVERTY

The traditional measures of poverty are based only on the monetary component of real income required to attain a normative minimum standard of consumption, namely the income available to cover market transactions. And although there is a well established market for housing, education and health services in Chile, middle and low income families have access to a broad spectrum of social services at prices considerably below their market price.

Thus, due to the omission of social services, the typical measure of income in Chile unambiguously underestimates the real income of the poor. Moreover it renders an incomplete assessment of the relationship between being poor and the extent of the "deficit" in their health, education, and housing status. But how one quantifies these transfers raises several questions that remain partly unresolved. One issue refers to the beneficiary's own valuation of the in-kind transfers, which could differ from the cost to the government of providing the service. A second

major limitation is the lack of detailed information at the household level to improve measurements of access to health and education.

Next we present an empirical assessment of the access to education, health, and housing, considered an essential determinant of the standard of living of the poor (based on CASEN data for 1998). Because we lack a single money-metric measure of deprivation to account for the various dimensions of poverty, several measures of deprivation are utilized to characterize this situation.

Educational achievements of the young

- Based on 1998 data, 16.5% of the 8-24 year old population had dropped out of school before receiving 12 years of education. Although the difference between the poor and the non-poor is significant, the gap is much lower than the income inequality observed.
- Demand rather than supply factors dominate in school non-attendance. Reasons given include looking for a job (42%), helping with household activities (13%), pregnancy or already having a child (9.5%) among others.
- 19.5 % of the student population (primary and secondary) is behind the norm (relative to expected schooling grade by age). The corresponding value for the very poor was 30%, compared to 24.4% for the poor and 16.9% for the non-poor.
- A preliminary index of education deficit at the household level (which includes frequency of illiteracy, non-attendance, school level behind the norm) shows that 48% of the very poor fall into this category, compared to 16.3% for the non-poor.

TABLE 8
EDUCATIONAL DEFICIT AT THE HOUSEHOLD LEVEL, CHILE 1998
(in % of households)

Number of deficit types	Very poor	Poor	Non poor	Total
0	51.5	54.6	76.4	73.1
1	26.1	25.8	17.7	18.9
2	11.6	11.4	4.4	5.5
3	6.1	4.9	1.1	1.6
4	2.7	2.4	0.3	0.6
5	0.8	0.5	0.1	0.2
6	0.9	0.3	0.0	0.1
7	0.1	0.1	0.0	0.0
8	0.1	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0

Source: Calculations based on 1998 CASEN survey.

Housing deficit

- Approximately 70% of families own their houses; 16.5% of households rent their dwelling; the remaining households obtain their dwellings on loan by relatives and/or provided by the employer;
- 77.7% of owners have fully paid for their property;
- 34.5% of the current owners had access to a public subsidy for the purchase of their property;
- An index of housing deficit based on minimum standards of quality of the housing reveals that between 3.6% and 15.9% of families live in housing that is deficient in every one of the six variables used to define the standards;
- 75.6% of the household population has no deficit in housing, based on an index of housing deprivation, and 12.3% (5.8%) experience one or two types of deficits. This index assumes equal weighting of deficits and should be interpreted as the frequency of unmet standards. It therefore does not convey a precise welfare valuation per se;
- Housing acquired with public subsidies is more likely to meet the minimum standards in terms of materials, infrastructure and occupancy.

Health care

- About 90% of the population is covered by either a public (61.7%) or a private (28.3%) health system coverage. The rest is either not affiliated or “does not know”;
- Approximately 40% of those affiliated to the public health system do not pay any contribution;
- Considering that (at least according to formal coverage), everybody has access to the Chilean public health insurance and because it acts as a last resort insurance providing health care services to everyone who demands it (regardless of previous affiliation), a supply constraint factor is unlikely to represent a “no access” condition for the non-affiliated category. However, “formal” access does not guarantee “adequate” access. But the data required to identify the reasons for non participation is inadequate, including the information on patient satisfaction reported in CASEN which does not provide clearly interpretable results related to objective health outcomes;
- Dental attention shows clear deficiencies. 38.5% of the population who required some kind of treatment did not have access to a proper facility. This is explained by the fact that dental treatment is not usually covered by either public or private health insurance;
- Regarding health prevention, the analysis concludes that there is no strong evidence that, relative to the non-poor, the low income population is below the standards.

TABLE 9
THE PROPORTION OF THE POPULATION AFFILIATED TO A HEALTH
INSURANCE SYSTEM, CHILE 1998

	Very poor	Poor	Non poor	Total
Public non-contributory	67.9	44.6	17.3	24.5
Public contributory	19.6	39.8	38.0	37.2
Private	2.6	5.3	28.3	23.1
Other	0.5	0.9	4.0	3.3
Not affiliated	9.2	8.8	11.5	10.9
Unknown	0.3	0.7	1.0	0.9
Total	100.00	100.00	100.00	100.00

Source: Calculations based on 1998 CASEN survey.

TABLE 10
COMPARISON OF THE HOUSING DEFICIT INDEX
(Households) Between 1990-98

	1990	1998
No deficit	57.2	72.7
One	14.7	11.9
Two	9.5	6.5
Three	8.1	4.8
Four or more	10.5	4.0
Total	100.0	100.0

Source: Calculations based on 1998 CASEN survey.

Table 9 shows the percentage of households for which deprivation (at the margin, whether accompanied or not by other types of deprivation) occurs using every possible combination of health, education, housing, and income deficits. The income poor - 16.1% of the population - may or may not experience other types of deprivation; e.g. education, health, housing and a comparison which attempts to establish that the implicit welfare deprivation from, say, low income (or health) is higher or lower than that from poor housing or schooling is meaningless from a welfare point of view. As shown in Table 9, the percentage of households that show deprivation of at least one variable ranges between 16% and 25%; those with deprivation in two variables ranges between 5% and 11%. The incidence falls to 2% to 5% in the case of simultaneous deprivation in three variables. Only 1.5% presents deprivation in all four dimensions. Thus, it can be said that poverty where the poor suffer deprivation in all four dimensions is not an overwhelming condition. On the negative side, there are relatively few households which show no type of deprivation. Only 51.1% of households are above the threshold in all four dimensions.

Trends in non-monetary poverty indicators between 1990 and 1998

Finally, we present a comparison of outcome indicators for education, housing, and health between 1990 and 1998, which corresponds to a period when public social expenditures increased significantly.

Education: The percentage of households with at least one deficit in education declined from 30.6% to 26.9% during this period. In terms of the severity of the deficit the gains are greater. Households with two or more members experiencing educational deficit declined from 12.8% in 1990 to 7.8% in 1998. The analysis reports a significant reduction in the percentage of the population which dropped out of primary school (from 5.1% to 1.4%), and those who dropped out from secondary school (4 or more years before graduation) fell from 15.1% to 9.9%. The percentage of students behind the expected level of grade attainment fell by significantly less (only three percentages points). Overall, the reduction in the educational deficit seems rather small in comparison to the substantial increases in government spending on education and considering the reduction in income poverty that occurred during the same period.

Housing: By contrast, the gains in reducing the housing deficit are considerably higher than those in education. In fact, the percentage of households that exhibit at least one dimension below standard declined from 42.8% in 1990 to 27.3% in 1998. Those with deficits in four or more dimensions declined from 10.5% to 4.4%. The largest gains occurred in access to electricity, where households without access represented not more than 3.8% in 1998. The lowest gains occurred in access to sewerage. Overall, the incidence of the housing deficit declined by almost half during the 8 year period.

Health: The findings for health services are less conclusive. This is largely due to the inadequate information provided in the CASEN survey regarding access and quality of health care services.

Overall, 51% of all households have no deficit at all in all three dimensions, while 1.5% of all households have a deficit in all three dimensions, and 41% have a deficit in at least one dimension.

4. CONCLUSIONS

The study shows that the trend of falling income poverty, in terms of incidence depth and severity, continued through into 1998. The proportion of people in poverty continued to fall, captured by the dramatic reduction in the headcount poverty measures from 23.1% in 1994 to 17% in 1998. Extreme poverty (indigence) fell from 5.1% in 1994 to 3.9% in 1998.

The study also confirms that income inequality in Chile remains high by international standards. The overall picture on inequality is one of a fairly stable distribution for the period as a whole, with changes in income shares being relatively small in proportion to the size of the shares themselves.

The analysis has confirmed that adjustments for in-kind income transfers substantially reduce the Gini coefficient on income inequality. For 1998, this coefficient falls from 0.56 (unadjusted) to 0.50 (adjusted) and the ratio of the highest (richest) to the lowest (poorest) quintile falls from 20 to 11. The test for significance shows that the reduction in inequality is statistically significant. A substantial reduction in inequality is also observed when applying alternative indicators, namely the Theil, a transformation of the coefficient of variation, and the mean log variation coefficient.

These results suggest that social policies in Chile have had a significant impact in reducing income inequality, in spite of the fact that such policies are oriented towards poverty reduction rather than reduction in inequality per se. Moreover, the analysis concludes that the impact of social policies was more significant in 1998 than in 1990. This resulted primarily from the significant increases in the budget allocation to such programs between 1990 and 1998, rather than from a better targeting or lower delivery costs. Expressed in 1998 pesos, the subsidy component of social programs increased from \$4,486 per capita in 1990 to \$10,225 per capita in 1998.

The study also presents a quantitative assessment of the “deficit” in their health, education, and housing status during the years 1990 and 1998, by comparing the access to these services with various thresholds based on widely accepted standards in each area. Overall, approximately 51% of all households have no deficit in all three dimensions (education, health, and housing). 41% have a deficit in at least one dimension, and only 1.5% of all households have a deficit in all three dimensions.

In education, the percentage of households with two or more members experiencing educational deficit declined from 12.8% in 1990 to 7.8% in 1998. The reduction in the housing deficit was considerably higher than that in education. The percentage of households that exhibit at least one dimension below standard declined from 42.8% in 1990 to 27.3% in 1998. Overall, the incidence of the housing deficit declined by almost half during the 8 year period. On health services the findings are less conclusive, largely due to inadequate information in the CASEN survey regarding the access to and quality of health care services.

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