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COMMITMENT TO EQUITY HANDBOOK

**ESTIMATING THE IMPACT OF
FISCAL POLICY ON
INEQUALITY AND POVERTY**

NORA LUSTIG, EDITOR

COMMITMENT TO EQUITY HANDBOOK

Estimating the Impact of Fiscal Policy
on Inequality and Poverty

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To Anthony Atkinson (1944–2017), one of the most brilliant thinkers on the topics of inequality, poverty, and social injustice

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Chapter 13

CHILE

The Impact of Fiscal Policy on Inequality and Poverty

Sandra Martinez-Aguilar, Alan Fuchs, Eduardo Ortiz-Juarez,
and Giselle Del Carmen

Since the early 2000s, Chile has adopted an integral approach to social policy, gradually incorporating a set of multi-sectorial programs and interventions to serve as a buffer against negative shocks. The introduction in 2002 of Chile Solidario as a strategy to overcome extreme poverty, the health reform of 2004 that created the Plan for Universal Access to Explicit Health Guarantees (Plan Acceso Universal a Garantías Explicitas), also known as General Regime of Explicit Health Guarantees (Regimen General de Garantías Explicitas en Salud), to reduce horizontal inequalities in access to health care,¹ the social security reform of 2008 that introduced a non-contributory component of the pension system (Pensiones Solidarias), the creation of a subsystem for comprehensive early childhood protection (Chile Crece Contigo), and the launch of a subsystem of social protection and opportunities (Ingreso Etico Familiar)²—all have contributed to a social protection system with a life-cycle perspective, combining universal and targeted coverage for specific groups with certain degrees of vulnerability. Through 295 social programs, 130 actions related to scholarships, pensions, and subsidies, and a budget of around 10 percent of the GDP as of the end of 2015, Chile's social policy delivers direct and in-kind transfers, family allowances, non-contributory pensions, and other types of social spending, including psychosocial support, technical advice, training, and credit and funding for productive projects.

¹The Plan AUGE (Universal Access to Explicit Guarantees), now called GES (Explicit Guarantees in Health), guarantees the coverage of 80 diseases by the public National Health Fund (FONASA) and the private health system (ISAPRE).

²This program was introduced to replace and extend the benefits of Chile Solidario.

The significance given to social policy is evidenced by the increase of per capita public social expenditure during the last decade, which occurred at an annual rate of 6.8 percent in real terms.³ During this period, the incidence of income-based poverty in Chile has significantly declined.⁴ The headcount for extreme poverty reduced from 12.6 percent in 2006 to 3.5 percent in 2015, equivalent to an average decline of 1 percentage point yearly, whereas the incidence of moderate poverty changed from 29.1 to 11.7 percent for an annual average decline of 1.9 percentage points. In the case of income inequality, changes in the Gini coefficient show a declining trend, although they were not statistically significant between 2006 (0.499) and 2013 (0.491), and it was not until 2015 that inequality registered a significant reduction (0.482).⁵

In order to estimate the effects that public social spending, along with the tax system, exert on poverty and inequality indicators in Chile, this chapter engages in a comprehensive tax-benefit incidence analysis using household-level data and administrative records for 2013. Specifically, the analysis presented in the next sections evaluates the concentration and incidence of several fiscal instruments in Chile—including direct and indirect taxes, contributory and noncontributory pensions, direct transfers, indirect subsidies, and in-kind government transfers in the form of health and education—to address five questions. First, who bears the tax burden and who receives the benefits from social spending? Second, are fiscal interventions in Chile equalizing? Third, are they poverty-reducing? Fourth, does Chile's fiscal system either hurt or benefit the poor, and in what magnitude? And finally, how do Chile's redistributive effects compare to those of Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Guatemala, Mexico, Peru, and Uruguay?

The contribution of this chapter to the empirical fiscal incidence literature and public debate in Chile is threefold. First, it focuses on the redistributive effects of fiscal policy using a standardized approach that allows the results to be compared across countries using the same methodology. For that purpose, the effects are computed not only at the national level and among the poor according to national official standards, but also across predefined income groups by international standards—namely poor, vulnerable, middle-class, and wealthy individuals.⁶ Second, this chapter presents results for innovative measures related to income-based poverty and inequality—namely

³This rate of change was calculated using the OECD social expenditure database (OECD, 2016a).

⁴In 2015, a multidimensional poverty measure was officially introduced to assess nonmonetary deprivations of households. This measure considers four equally weighted dimensions, each measured through three indicators: education (school attendance, years of schooling, and underachievement), health (child malnutrition, access to the health system, and medical care), labor and social security (access to social security, employment status, and retirement), and housing (overcrowding, dwelling conditions, and access to basic services).

⁵Official figures on poverty incidence and income inequality are taken from Ministerio de Desarrollo Social (2016).

⁶For a definition of these income groups, see the end of section 2 of this chapter.

“fiscal impoverishment” and “fiscal gains to the poor,” per Higgins and Lustig (2016),⁷ and “marginal contributions” to poverty and inequality, per Enami, Lustig, and Aranda (2018).⁸ Finally, the chapter offers evidence of a counterintuitive but possible (and frequently overlooked) result: Chile’s fiscal system features regressive, yet equalizing indirect taxes. This conundrum involving the redistributive effects of indirect taxes in Chile shows that sound and robust fiscal incidence analyses should assess the redistributive impacts of fiscal interventions as part of a whole system, and not as isolated tools, which in turn could lead to misleading policy conclusions.

The chapter is structured as follows. Section 1 provides a brief description of Chile’s social spending and tax systems and the main interventions included in the incidence analysis. Section 2 describes the methodology, the data sources exploited, and the assumptions made in estimating the benefits received and the taxes paid by individuals. Section 3 presents the main results, and finally, the concluding remarks are presented in section 4.

1 Social Spending and Taxes in Chile

In 2013, the year for which the incidence analysis is carried out, public social spending defined as the sum of social protection, education, health, and housing accounted for 10.7 percent of the country’s GDP, and for 13.7 percent if contributory pensions are included in the definition, as is often done (table 13-1). Education, health, and social assistance are the three core concepts of social spending analyzed in this and twenty-nine other assessments applying the same fiscal incidence methodology. The three concepts account, respectively, for 4.3, 3.8, and 1.6 percent of Chile’s GDP, which are around the average levels of the other 29 countries shown by Lustig (2018a) in chapter 10 of this Handbook, but well below the comparable averages for the Organization for Cooperation and Development (OECD), countries which are 5.3, 6.2, and 4.4 percent, respectively. Regarding contributory pensions, there is no agreement in the fiscal incidence literature: these pensions can be treated either as a government transfer or as deferred income—for example, as part of the Market Income. This chapter takes a neutral stance on the issue given that the fiscal incidence analysis was carried out for both scenarios. The results using either option, however, do not affect the conclusions derived because of the small size of the pay-as-you-go system. This chapter thus presents the analysis considering contributory pensions as deferred income.

There are several categories of social spending. The first includes all public expenditure on all levels of education, including government spending on both public and private educational institutions. Expenditure on health considers all public spending on primary, secondary, and tertiary healthcare of the three systems in place in Chile:

⁷ Reprinted as chapter 4 of this Handbook.

⁸ Chapter 2 of this Handbook.

TABLE 13-1
Structure of Chile's Government Spending, 2013

Government spending	% of total expenditure	% of GDP	Included in analysis
Total expenditure	100.00	21.65	
Social spending	63.14	13.67	
Social protection	21.10	4.57	
Social assistance	7.59	1.64	
Conditional/unconditional cash transfers	1.96	0.42	Yes
Noncontributory pensions	4.05	0.88	Yes
Near-cash transfers	1.47	0.32	Yes
Other	0.11	0.02	No
Social security	13.51	2.93	
Old-age pensions	10.15	2.20	Yes
<i>Bonos de reconocimiento</i>	3.36	0.73	No
Education	19.80	4.29	
Preschool	2.38	0.51	Yes
Primary	7.05	1.53	Yes
Secondary	4.03	0.87	Yes
Adults	0.31	0.07	Yes
<i>Diferencial</i>	1.23	0.27	Yes
Tertiary	4.11	0.89	Yes
Non-separable by level	0.69	0.15	Yes
Health	17.59	3.81	
Primary FONASA	3.36	0.73	Yes
Secondary/tertiary FONASA, MLE, FF.AA.	10.32	2.23	Yes
Sectoral investment	0.81	0.18	Yes
Supply of the national health system	0.04	0.01	Yes
Other	3.06	0.66	No
Housing and urban services	4.65	1.01	No
Subsidies	2.26	0.49	
Energy	-	-	No
Water	0.20	0.04	Yes
Gas in the Magallanes region	0.09	0.02	Yes
Public transportation	1.96	0.42	Yes
Infrastructure	1.46	0.32	
Water and sanitation	0.55	0.12	No
Rural roads	0.92	0.20	No
Defense spending	4.72	1.02	No
Other spending	(7,058.59)	6.15	No

Source: Authors' elaboration based on the 2013 executed budget published by Chile's Budget Office (Dirección de Presupuestos, DIPRES).

Notes: Other spending includes, for instance, legislative spending, or expenditures on culture and sports.

MLE= Modalidad Libre Elección (free-choice modality); FF.AA. = Armed forces.

The figures shown do not necessarily coincide with those published by multilateral organizations due to differences in concepts and definitions.

the National Health Fund (FONASA)⁹ and those for the armed forces (CAPREDENA) and the police (DIPRECA).

The third category, social assistance, is composed of unconditional and conditional cash transfers, noncontributory pensions, and near-cash transfers. Cash transfers include the cash benefits from Chile's conditional cash flagship program (Chile Solidario / Ingreso Etico Familiar), the family allowances scheme of the subsystem for comprehensive early childhood protection (Chile Crece Contigo), noncontributory pensions (Pensiones Solidarias), and other allowances and special scholarships.¹⁰ Near-cash transfers include complementary support for food, school texts, clothes, and school supplies.¹¹ An additional aspect of public spending that is taken into account, but not as part of social spending, is that of subsidies, particularly for water, public transportation, and gas in the Magallanes region, which account for 0.49 percent of the GDP. The water subsidy is targeted to low-income families who face difficulties paying for running water services; that for public transportation is a generalized subsidy, benefiting all the user population; and that for gas is applied to all families living in the aforementioned region of the country.

Regarding Chile's income structure, in 2013 total government revenues represented 21 percent of the GDP, of which tax revenues accounted for about 80 percent (or 16.7 percent of the country's GDP) with a relatively higher dependence on indirect taxes on sales of goods and services (9.8 percent) than on direct taxes on income (6.6 percent)¹² (table 13-2). For direct taxes, the incidence analysis considers only those on personal income: (1) the Second Category Tax (SCT), which is a monthly tax levied

⁹This considers the two modalities of FONASA: institutional and free-choice.

¹⁰The following allowances of the flagship cash transfers program—related to social protection, child health, school attendance, school achievement, and female work—are considered in the analysis: Bono de proteccion social y egreso, Bono base familiar, Bono por control del niño sano, Bono por asistencia escolar, Bono por logro escolar, and Bono al trabajo de la mujer. In the case of Chile Crece Contigo, the following child, maternity, disability, and mental disability allowances are included: Subsidio familiar al menor o recién nacido, Subsidio de asistencia maternal, Subsidio familiar a la madre, Subsidio familiar por invalidez, and Subsidio discapacidad mental. Cash transfers for old-age and disabled population (Pensiones Solidarias) include Pension Basica Solidaria de Vejez e Invalidez, Aporte Previsional Solidario de Vejez e Invalidez, and Pensiones de Leyes Especiales de Reparacion. Other benefits in cash include: Bono bodas de oro, Bono de invierno, Bono marzo, Asignacion Familiar, Subsidio empleo joven, Aporte estatal Fondo de Censatia Solidario, Descuento Cotizaciones de Salud, Beca Indigena, Beca Retencion Escolar, and Beca Presidente de la Republica.

¹¹The near-cash transfers included in the analysis are Progama Nacional de Alimentacion Complementaria, Progama Nacional de Alimentacion Complementaria para el Adulto Mayor, Programa de Alimentacion Escolar, Yo elijo mi PC, and Utiles Escolares.

¹²Chile's tax burden of 16.7 percent of GDP, as reported by administrative data, does not necessarily coincide with the figures published by multilateral organizations due to differences in concepts and definitions. Using revenue statistics of the OECD (2016b), we find that the tax burden

TABLE 13-2
Structure of Chile's Government Revenues, 2013

Government revenues, contributions to social security and grants	% of total	% of GDP	Included in analysis
Total	100.00	21.01	
Revenues	92.92	19.53	
Tax revenues	79.60	16.73	
Direct taxes:	31.51	6.62	
Personal income tax	6.28	1.32	Yes
Corporate income tax	17.57	3.69	No
<i>Adicional</i>	5.44	1.14	No
Others	2.22	0.47	No
Indirect taxes:	46.69	9.81	
VAT	37.81	7.95	Yes
Sales tax (alcoholic/nonalcoholic beverages)	0.89	0.19	Yes
Sales tax (luxury goods, cars and others)	0.05	0.01	No
Excise taxes	6.89	1.45	Yes
Foreign trade taxes	1.05	0.22	No
Others	1.49	0.31	No
Nontax accounts	-0.10	-0.02	No
Nontax revenues	13.32	2.80	No
Contributions to social security	6.83	1.43	
From employees	6.62	1.39	Yes
From employers	0.21	0.04	No
Grants	0.25	0.05	No

Source: Authors' elaboration based on Dirección de Presupuestos (2014) and the 2009–15 data on annual tax revenue published by Chile's Servicio de Impuestos Internos, SII (2015).

on income derived from labor income such as salaries, contributory pensions, and other remuneration; and (2) the Complementary Global Tax (CGT), which is levied on annual total income obtained by an individual, with any SCT paid or First Category Tax (FCT)¹³ related to dividends received being creditable against it. The rates for both SCT and CGT range from 0 to 40 percent.

For indirect taxes, the analysis includes: (1) the value-added tax (VAT), which is levied at a rate of 19 percent on sales of goods and services; (2) special taxes on

in Chile in 2013 is close to the Latin American average, but well below (by about 12 percentage points) the tax burden of Argentina, Brazil, and the OECD average.

¹³The FCT is levied on income from capital and from enterprises that undertake commercial, industrial, and other activities. The FCT paid by an enterprise can be used as a credit against the CGT to which its owners, shareholders, partners, or managers are liable when they receive dividends.

nonalcoholic and alcoholic beverages, which are charged in addition to the VAT and on the same tax base as that for VAT with varying rates depending on the alcohol content; (3) excise taxes levied on tobacco, which are charged on the value of the sale to the final consumer with varying rates depending on the product (for example, cigars, processed tobacco, and cigarettes); and (4) excise taxes on fuels, with a base determined by the amount of fuel expressed in cubic meters. Finally, social contributions from employees to healthcare, unemployment insurance, and contributory pensions are also included in the analysis. Contributions to health include FONASA, and the health systems of the armed forces (CAPREDENA) and police (DIPRECA).

2 Methodology, Data, and Assumptions

The analysis follows the CEQ methodology described in Lustig and Higgins (2013) to assess the distributional impact of taxes, transfers, and subsidies across income groups in Chile in 2013 based on household-level data and administrative records on taxes and social spending. Basically, the methodology consists of defining income concepts first, and then allocating taxes, social contributions, subsidies, and public social spending to individuals included in the household survey in a consistent and methodologically sound way, so that it is possible to compare incomes and income-based measures of well-being before and after taxes and public transfers.

The methodology has two standard scenarios depending on how contributory pensions are treated: as deferred income or as government transfers. In the analysis for Chile, both scenarios can be constructed by using two definitions of income that are employed in the estimation of official figures of income inequality and income-based poverty. The measurement of inequality in Chile uses a *monetary income* definition, which is composed of wages and salaries (monetary and in-kind), earnings from self-employment, self-provision of goods produced by the household, rents, interest, dividends, retirements, pensions, private transfers, and public monetary transfers. In the case of poverty, the measurement is based on a *total income* definition, which is equivalent to monetary income plus imputed rent. It is important to highlight that the methodology for measuring income changed in 2013 and that the new approach is the one employed in this chapter. Specifically, household income is no longer adjusted to national accounts, and the new estimation of the imputed rent considers not only owner-occupied dwellings, but also dwellings that were donated or given as work benefit, or dwellings in usufruct.¹⁴

This chapter uses the 2013 National Socioeconomic Characterization Survey (CASEN) carried out by the Ministry of Social Development, which is a nationally representative sample collecting detailed information on household incomes, as well as

¹⁴The official methodology for the measurement of poverty also changed. The new method incorporated new poverty lines based on updated values of both basic food and basic nonfood baskets, equated the value of the poverty lines between urban and rural areas, and adjusted the poverty lines based on equivalence scales.

on individual and dwelling characteristics. This survey is employed as the primary source of data in the incidence analysis as it is the official data set to measure the levels of poverty and income inequality in Chile. Since the CASEN does not collect information on household spending, the Family Budget Survey (EPF) for 2011–12 is employed as a secondary source to estimate indirect taxes on household consumption. This survey was carried out by the National Institute of Statistics and is aimed at identifying the structure and characteristics of final consumption of urban households in the regional capitals of the country. In addition, the analysis considers official data on government revenues and expenditures from the 2013 executed budgets reports published by the Ministry of Finance’s Budget Office, the Ministry of Social Development, the National Institute of Statistics, and the National Audit Office.

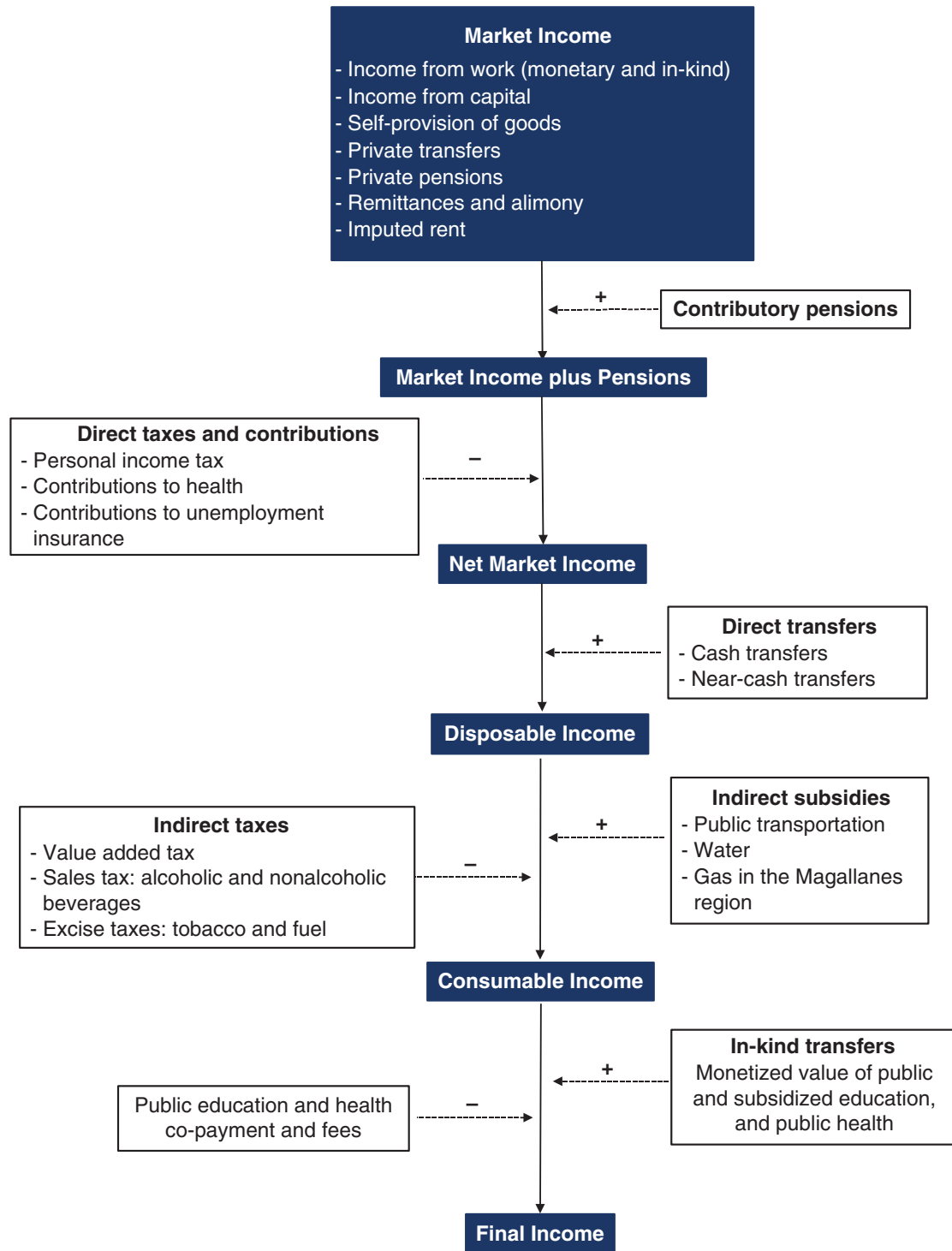
In order to assess the distributional effects of fiscal interventions, the core building block of the fiscal incidence analysis is the definition and construction of the income concepts using the previous data sources (figure 13-1). The allocation of fiscal interventions to individuals in the CASEN, depending on the income concept, is based on the following methods: *direct identification*, when the survey contains information on who receives (pays) benefits (taxes), as well as the amount received (paid); *imputation*, when the survey informs who receives (pays) benefits (taxes), but the amount received (paid) is retrieved from administrative records or program (tax) rules; *simulation*, when neither direct identification nor imputation can be used, so that the beneficiaries (taxpayers) and the amount received (paid) is simulated based on the program (tax) rules; and imputation based on *secondary sources*.¹⁵

The income reported in the CASEN is the income after direct taxes and social contributions, which is equivalent to the Net Market Income concept—composed of wages and salaries from the formal and informal sectors, income from capital, private transfers such as remittances and alimonies, pensions, and imputed rent—and is therefore the baseline for constructing the other income concepts. In order to construct Market Income, a “reverse engineering” process from Net Market Income is implemented by simulating and adding direct taxes and social contributions based on fiscal rules.

For direct taxes paid by each individual, taxes on salaries and remunerations (Second Category Tax, SCT) and taxes on other personal income (Complementary Global Tax, CGT) are allocated using simulation. This method applies the statutory rate and discount of each Taxable Income bracket defined by the Internal Revenue Service (IRS) to the Taxable Income reported by each individual in the CASEN. The Taxable Income for salaried workers is Gross Income minus bonuses for Christmas and national festivities and social security contributions, while for independent workers who report issuing invoices or receipts, the Taxable Income is 70 percent of total annual Gross Income. For all the individuals, all rents before taxes are added up to calculate the CGT. Finally, given that the CASEN contains information on who receives income from profits withdrawal as well as the amount received, the tax paid on business income

¹⁵ For a detailed description of these and other allocation methods, see Higgins and Lustig (2018).

FIGURE 13-1
 Definition of Income Concepts in Chile's Incidence Analysis



Source: Authors' elaboration based on Lustig and Higgins (2013).

(First Category Tax, FCT) is calculated and used as a tax credit to the CGT. It is important to highlight that the following concepts are not included in the Taxable Income: tips, per diems, in-kind income, and auto-consumption. In addition, it is assumed that incomes from rental of nonagricultural properties,¹⁶ vacation rentals, and self-employment in the informal sector do not pay income taxes. In the case of social contributions, the CASEN identifies who contributes to health care and to what system, and the amount of the contribution is allocated using simulation based on the level of income before taxes, the stipulated rates of each system, and the maximum and minimum taxable limits.

The construction of the Market Income plus Pensions concept requires adding contributory pensions to Market Income. In Chile different contributory pension systems coexist: an individual capitalization system and two pay-as-you-go schemes—namely, the police and armed forces system and the old pension system of the former Cajas de Previsión Social. The individual capitalization is a system with compulsory, forced savings, and it is part of the Market Income concept—since the pension is the product of the individual’s savings—while the two pay-as-you-go systems can be treated either as deferred income or as government transfer—since the share contributed by both the individual and the government is unknown. For the Market Income plus Pensions concept, contributory pensions from the two pay-as-you-go schemes are treated as deferred income, and the allocation method is direct identification.

The Disposable Income concept is constructed by adding direct cash and near-cash transfers to Net Market Income. For all cash transfers the allocation method is direct identification, while for all near-cash transfers the allocation method is imputation since although the CASEN identifies who receives the benefit, the amount is taken from administrative accounts.¹⁷ The addition of subsidies to and the discount of indirect taxes from Disposable Income yields the Consumable Income concept. In the first case, the analysis considers subsidies to water consumption, public transportation, and gas for the Magallanes Region. The allocation method for water subsidies is direct identification, whereas public transportation and gas subsidies are allocated using simulation. For each of the two latter subsidies, the total executed expenditure is divided by the total targeted population, and the result is then scaled down to prevent overestimation bias.¹⁸ Regarding indirect taxes, it is assumed that they are paid entirely by the consumers, and their estimation is based on the EPF, which is used to calculate, by consumption decile, the shares of consumption spent

¹⁶ Either properties under the Decree-Law No. 2, or for the use of the owner and her or his family, or whose rents are less than 11 percent of the property valuation.

¹⁷ In the case of the scholarships Beca Indígena, Beca Retención Escolar, and Beca Presidente de la República, although they are considered as cash transfers, the allocation method is imputation.

¹⁸ For a detailed description of the scaling down procedure, see Higgins and Lustig (2018), chapter 6 of this Handbook.

on indirect taxes. Since these shares must be imputed to each individual's Disposable Income in the corresponding consumption decile, it is necessary to rank individuals in the CASEN by consumption decile, which requires both the CASEN and EPF surveys to interlock.

The estimation of indirect taxes in the EPF and the survey-to-survey imputation follows the hot-deck procedure used by Larrañaga and others (2012) in their tax-benefit microsimulation model for Chile. In order to avoid a potential overestimation of the actual VAT rate paid and to be consistent with the CEQ methodology, a distinct feature in the treatment of the VAT between that microsimulation model and the incidence analysis presented in this chapter is that the latter does not use the statutory rate (19 percent); instead, it uses the effective rate (14.3 percent), which is based on the estimate of evasion (24.5 percent) in 2013.¹⁹ For the estimation of the VAT, the analysis considers fiscal exemptions, the most important being those on health, education, insurance and financial operations, gambling, and cultural services. It also considers special sale taxes such as those on alcoholic and nonalcoholic beverages and excise taxes such as those on tobacco and fuel.

The last income concept, Final Income, is constructed by adding the monetized value of in-kind transfers on education and health to Consumable Income and by subtracting the corresponding copayments and fees for the use of such services from Consumable Income. For both education and health, the allocation method is imputation. In the first case, the CASEN allows us to identify who attends an educational institution, the educational level attended, and the financing scheme of the institution—public, subsidized, or private—so that it is possible to impute the average cost of education disaggregated by level of education, by financing scheme, and, in the case of tertiary education, by whether the benefit is received by the institution or by the student. If the student is the recipient, the imputation is disaggregated by benefit, scholarship, or credit, with the latter considering only the fee paid for the credits bought by the government under the *Credito con Garantia Estatal* scheme (credit guaranteed scheme). In the case of health, the CASEN identifies who is affiliated with FONASA, DIPRECA, or CAPREDENA systems, respectively, so that the analysis imputes the average cost based on the use of health services.

The assessment presented in this chapter offers the most comprehensive tax-benefit incidence analysis available for Chile to date and allows for the results to be comparable with other developing countries by applying the same methodology. Yet, since the results presented are point-in-time and do not account for behavioral, general equilibrium, or lifecycle effects, they do not take into account the long-term effects of fiscal policy on well-being indicators. In addition, we acknowledge the potential presence of measurement errors due to under-reporting of certain income categories and under-sampling of the top incomes in the household surveys.

¹⁹The magnitude of VAT evasion was estimated by Chile's internal revenue service (Servicio de Impuestos Internos, 2015).

The evidence presented in the next section, as mentioned before, corresponds to the scenario that considers contributory pensions as deferred income instead of as government transfer, and for comparability purposes with other countries the analysis uses the total income definition, instead of the monetary income definition, to account for the imputed rent. In pursuance of a better understanding of the incidence of fiscal policy in Chile, the following income groups are used: *poor*, defined as those individuals with per capita income below the US\$4 a day poverty line and including within this group the “ultra-poor” (living with less than US\$1.25/day), the “extreme poor” (living on US\$1.25–US\$2.50/day), and the “moderate poor” (living on US\$2.50–US\$4/day); *vulnerable*, defined as those with per capita income between US\$4 and US\$10 a day; *middle class*, defined as those living on US\$10–US\$50/day; and *wealthy*, defined as those with per capita income above US\$50/day.²⁰ The analysis also considers the incidence on the extreme and moderate poor as defined using the official poverty lines in Chile, as well as on income deciles.

3 Main Results

3.1 Redistributive Effects of Chile’s Fiscal System

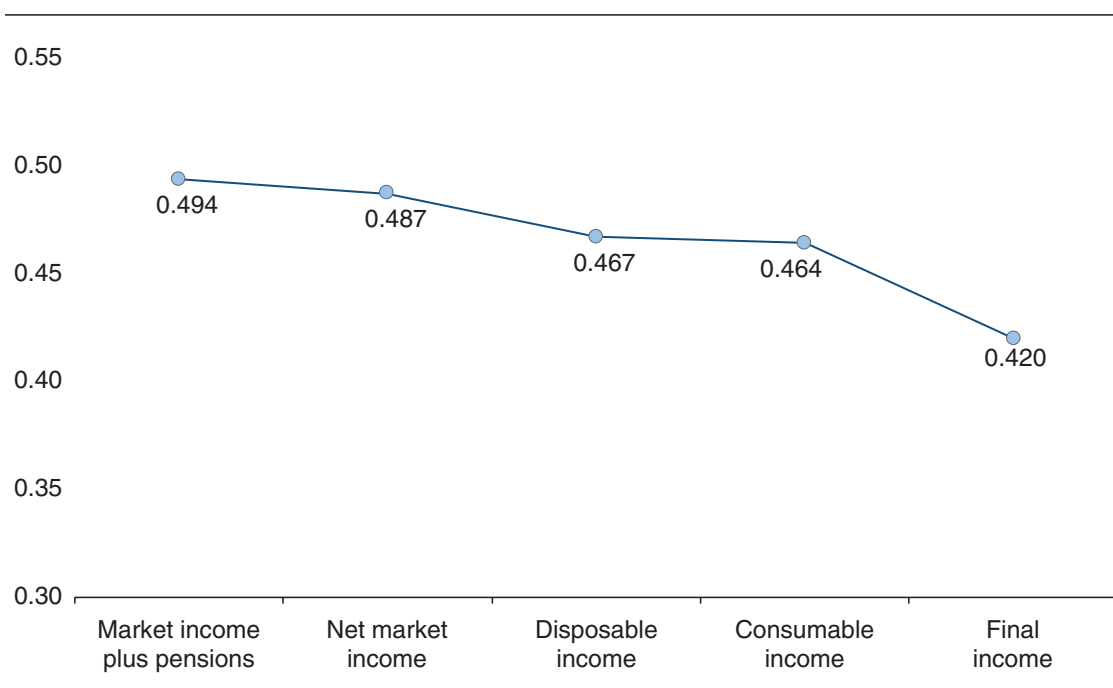
Are fiscal interventions in Chile equalizing? Figure 13-2 shows that income inequality in Chile, as measured by the Gini coefficient, declines from 0.494 to 0.467 when moving from Market Income plus Pensions to Disposable Income²¹—that is, after the intervention of direct taxes, social contributions to health and unemployment insurance, and direct transfers.

When analyzed independently, social contributions to health and unemployment insurance are found to be regressive with respect to Market Income plus Pensions, with a Kakwani progressivity index of -0.17 , whereas both direct taxes and direct transfers

²⁰The poverty line of \$1.25/day is the standard used by the World Bank to measure the incidence of poverty globally; its value corresponds to the average of the poverty lines of some of the poorest countries in the world. The \$2.50/day and \$4.00/day poverty lines are equivalent to the conditional mean of the national extreme and moderate poverty lines, respectively, across Latin American countries (conditional on GDP per capita). The thresholds to define the vulnerable, middle-class, and upper-class groups are those proposed by Lopez-Calva and Ortiz-Juarez (2014). All these figures are expressed in 2005 PPP prices.

²¹The Gini coefficients shown in figure 13-2 are different from the official estimates because the latter uses the monetary income definition, which excludes the imputed rent, whereas this chapter uses the total income definition in order to include it and thereby allow for cross-country comparisons. If the imputed rent is excluded from the analysis, for instance, the Gini coefficient for Disposable Income would be 0.490 instead of 0.467, which is virtually the same value as that reported by the Ministerio de Desarrollo Social (2016): 0.491.

FIGURE 13-2
Effects of Fiscal Interventions on Income Inequality (Gini coefficients)



Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016).

are progressive with a Kakwani index of 0.45 and 0.82, respectively.²² This is not a surprising result given the design of the two latter interventions. As figure 13-3 shows, the lion's share of total direct taxes (89 percent) is paid by the wealthy (who comprise 6.7 percent of Chile's population), and the remaining 11 percent is paid almost entirely by the middle-class group that accounts for more than half of the country's population. The share of direct taxes paid is negligible (0.02 percent) for the third of the population identified as vulnerable, whereas the 7.5 percent of the poor population likely do not pay these kinds of taxes.²³ Regarding the concentration of direct transfers—that is, who receives the benefits—figure 13-3 shows that almost two-thirds of the total amount is received by the poor (18.4 percent) and the vulnerable (44.6 percent), whereas the middle-class accounts for most of the remaining share (35.3 percent).

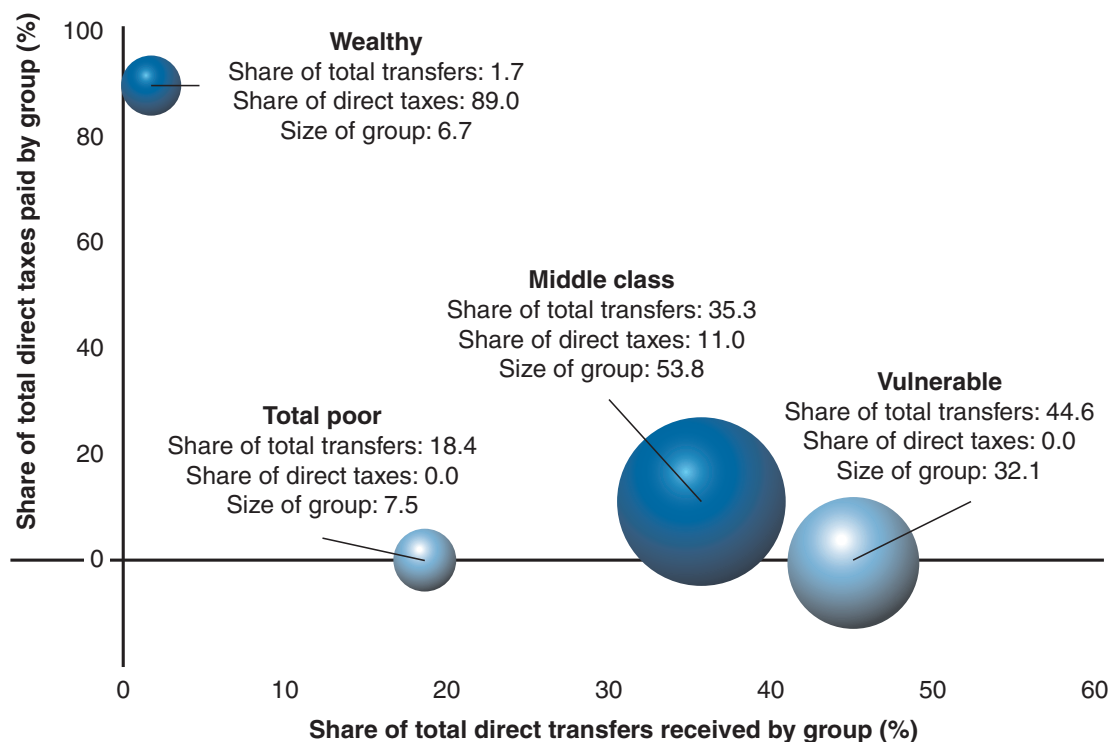
The Kakwani index, however, cannot tell if these and other fiscal interventions make the whole fiscal system more (un)equal,²⁴ because the effect of a tax or transfer

²²The Kakwani index for all fiscal interventions analyzed is shown in table 13A-1 in the appendix.

²³If the concentration of direct taxes is analyzed by income deciles instead of income groups, the results are strongly consistent with findings by Engel, Galetovic, and Raddatz (1999) and by Castelletti (2013).

²⁴When taxes or transfers are seen as single, independent interventions, the Kakwani index is sufficient to unambiguously establish that a progressive (regressive) tax or transfer is equalizing (unequalizing). In a multitax/multitransfer setting, however, this direct relationship does not

FIGURE 13-3
Concentration of Total Direct Taxes Paid on Personal Income and Total Direct Transfers Received, by Income Group



Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016).

Notes: The "Total poor" group includes the share of the population living in ultra (0.8 percent), extreme (2 percent), and moderate (4.7 percent) poverty, based on the total Market Income plus Pensions concept. The income thresholds to define the groups are the following: less than US\$1.25/day for the ultra-poor, US\$1.25–US\$2.50/day for the extreme poor, US\$2.50–US\$4.00/day for the moderate poor, US\$4–US\$10/day for the vulnerable, US\$10–US\$50/day for the middle class, and above \$50/day for the wealthy. The size of the bubbles is relative to the size of each group as measured with total Market Income plus Pensions.

is not independent from the effect of other interventions. Therefore, in order to answer the initial question, marginal contributions are used, which are equivalent to the difference in inequality with and without a specific tax or transfer.²⁵ Taking Disposable Income as the relevant end income concept, the marginal contributions of most of the

necessarily hold (Lambert 2001). The Kakwani (1977) index for taxes is defined as the difference between the concentration coefficient of a tax and the Gini coefficient of pretax income. The index for transfers is defined as the difference between the Gini coefficient of pre-transfer income and the concentration coefficient of a transfer.

²⁵ As shown in Enami, Lustig, and Aranda (2018), chapter 2 in this Handbook, the marginal contribution of a tax (transfer) to inequality is calculated by taking the difference between the Gini coefficient of the relevant end income concept without the tax (transfer) and the Gini coefficient of the relevant end income concept with the tax (transfer). Because of path dependency, the sum of the marginal contributions of each fiscal intervention will not be equal to the total change in inequality.

fiscal interventions are equalizing; the only exception is social contributions to health and unemployment insurance, which show an unequalizing effect. Specifically, direct taxes and noncontributory pensions have the largest impact on the decline in inequality, with a marginal contribution of about 0.01 Gini points (figure 13-4, panel A).

Moving from Disposable Income to Consumable Income further reduces the Gini coefficient to 0.464 (figure 13-2, which is indicative of a remarkable finding: the net effect of adding indirect subsidies to and subtracting indirect taxes from Disposable Income is equalizing. As panel B of figure 13-4 shows, this is due not only to the positive marginal contribution of indirect subsidies to inequality reduction, but also to the fact that indirect taxes have a slightly positive effect despite their regressivity, as indicated by a Kakwani index of -0.03 . The latter result is referred to in the literature as the “Lambert’s conundrum” (Lambert, 2001), which states that “if taxes are regressive in relation to the original income, but progressive with respect to the less unequally distributed post-transfers (and subsidies) income, regressive taxes exert an equalizing effect over and above the effect of progressive transfers.”²⁶

As noted, indirect taxes in Chile are regressive with respect to Market Income plus Pensions (the original income), but they are progressive with respect to Disposable Income (the less unequally distributed post-transfers income), as indicated by a Kakwani index of 0.09. Indirect taxes, therefore, exert an equalizing effect over and above the effect of progressive direct taxes and direct transfers. This finding indicates that the redistributive impact of fiscal interventions must be assessed by considering the whole system and not as isolated tools, which in turn could lead to misleading policy conclusions.²⁷ Overall, when taking Consumable Income as the end concept, only social contributions and the subsidy to gas exhibit, respectively, a negative and neutral effect on inequality, whereas both direct taxes and transfers account for the largest positive marginal contributions (figure 13-4, panel B). The overall equalizing effect of taxes and direct transfers is unambiguous as the Lorenz curve for Consumable Income lies completely above the Lorenz curve for Market Income plus Pensions (figure 13-5).

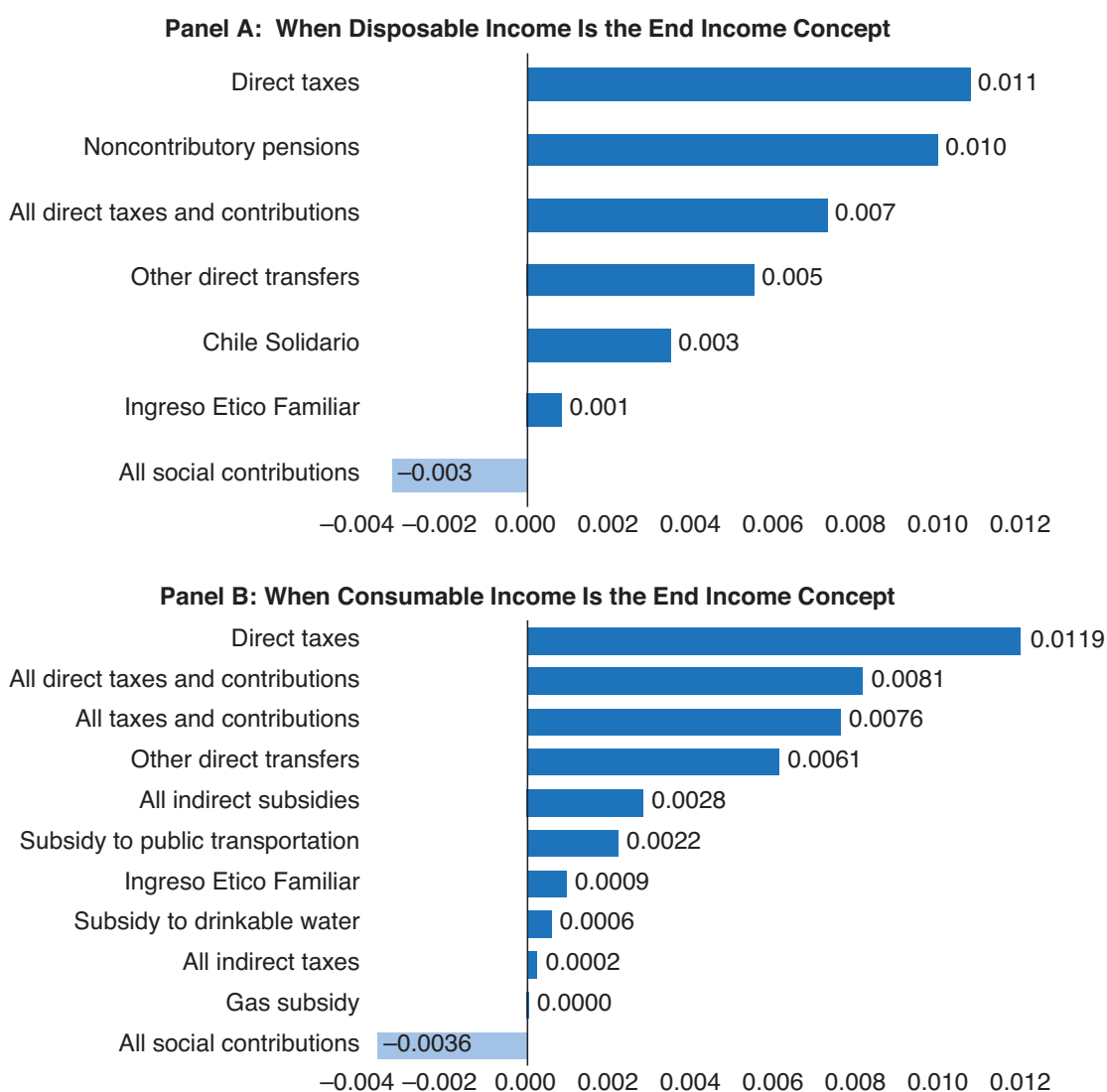
Finally, in-kind transfers in the form of education and health services have an even larger positive effect on inequality when moving from Consumable Income to Final Income: the Gini coefficient reduces to 0.420, equivalent to a 15 percent decline relative to Market Income plus Pensions (figure 13-2). The marginal contributions to inequality reach 0.032 Gini points for education and 0.014 Gini points for health, and the equalizing effect holds for all levels of education, as indicated by their positive marginal contribution to inequality (figure 13-6).²⁸ The large effect of in-kind transfers on

²⁶ Enami, Lustig, and Aranda (2018), chapter 2 in this Handbook. The authors offer a detailed theoretical explanation for this counterintuitive result.

²⁷ Recently, Eduardo Engel, using the same data exploited in Engel, Galetovic, and Raddatz (1999), found the same Lambert’s conundrum in the Chilean system.

²⁸ A summary of the marginal contributions for all fiscal interventions analyzed is shown in table 13A-1 in the appendix.

FIGURE 13-4
Marginal Contributions of Fiscal Interventions to Income Inequality (Gini points)

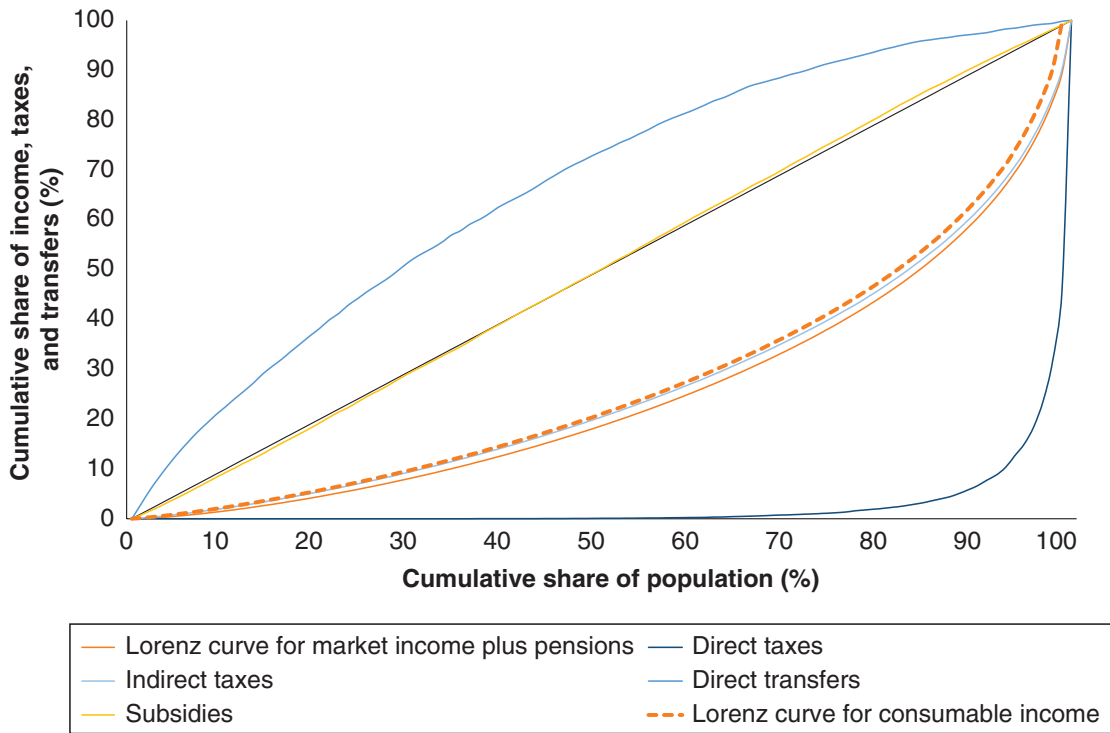


Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016).

inequality is not surprising given that Chile spends significantly more on education and healthcare (roughly 8.1 percent of the GDP) than on direct transfers and pensions (1.6 percent of the GDP). Yet, such a result must be interpreted with caution because in-kind transfers are monetized at average government cost, which does not necessarily reflect the actual value of the education and health services provided, and there are no adjustments for differences in quality across the distribution. The method assumes that a poor person living in a rural area receives the same benefit as an urban middle-class person, for instance.

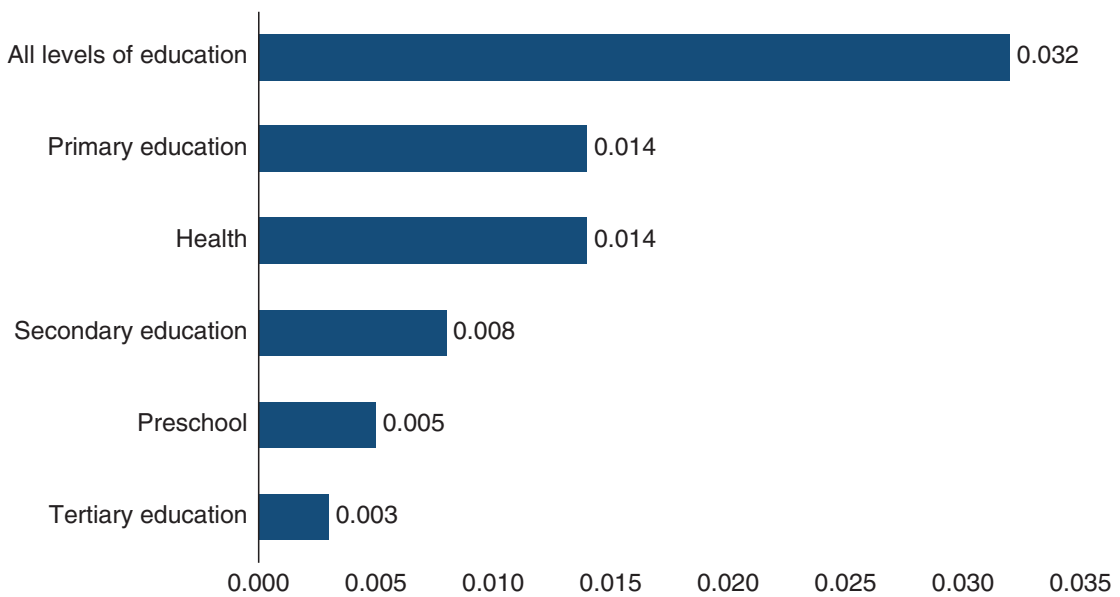
While most fiscal interventions in Chile are found to be equalizing, a second fundamental question then emerges: Are fiscal interventions also poverty-reducing? While

FIGURE 13-5
Concentration and Lorenz Curves



Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016).

FIGURE 13-6
Marginal Contributions of In-Kind Transfers to Income Inequality (Gini points)



Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016)

the combine effect of direct taxes and social contributions does increase the incidence of poverty (figure 13-7, panel A)—an effect that is driven mostly by social contributions given that the population in poverty likely does not pay direct taxes—direct transfers more than compensate this effect. Specifically, poverty headcounts decline by nearly 3 percentage points (or around 40 percent) with respect to Market Income plus Pensions for both the official extreme and \$4/day poverty lines, and by 4 percentage points (or 24 percent) for the official moderate poverty line.

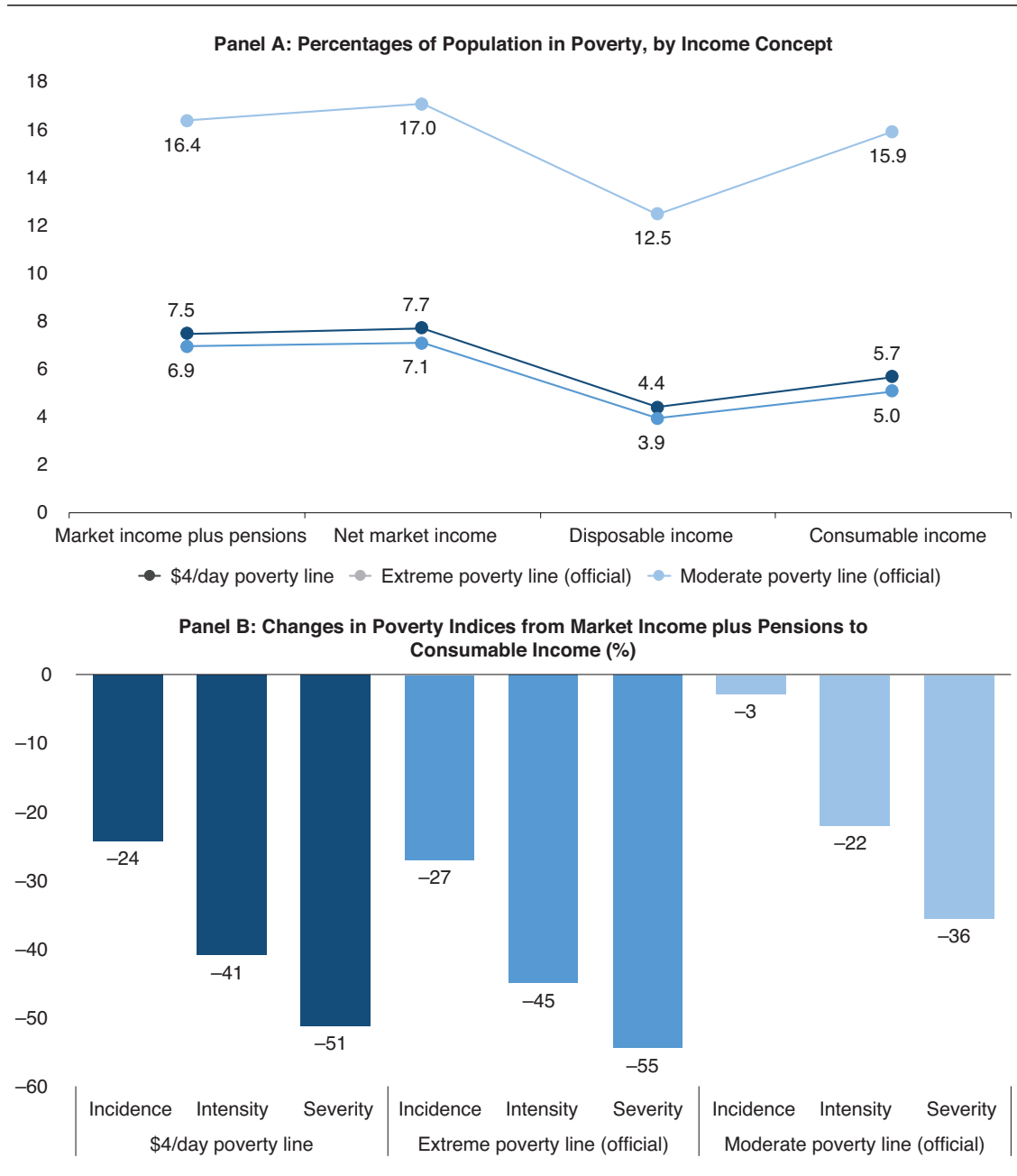
While indirect taxes, as expected, increase the incidence of poverty when moving from Disposable Income to Consumable Income, the effect is not large enough to nullify the gains from direct transfers—and also from subsidies, which exhibit a positive marginal contribution to poverty (figure 13-8); therefore Consumable Income–based poverty still remains below the incidence measured with Market Income plus Pensions: 1.8 percentage points (or 24 percent) below using the \$4/day poverty line, 1.9 points (or 27 percent) below using the official extreme line, and half a point (or 3 percent) below using the official moderate line.²⁹ Moreover, after the intervention of taxes, subsidies, and direct transfers, not only does the incidence of poverty decline, but also the depth of poverty (intensity) and the magnitude of inequality among the poor (severity) fall remarkably (figure 13-7, panel B).

A breakdown of the fiscal system after the intervention of taxes, subsidies, and direct transfers reveals that the latter have the largest positive marginal contributions to the reduction of the incidence of poverty: between 3.9 and 5.3 percentage points, depending on the poverty line used. In particular, noncontributory pensions account for between 1.7 and 2.5 percentage points of the poverty decline, whereas Chile Solidario and Ingreso Etico Familiar are responsible for 0.9 and 0.2 percentage points, respectively (figure 13-8). The contribution of indirect subsidies to the poverty decline is positive overall, yet modest for public transport and water subsidies, and virtually neutral for gas subsidies in the Magallanes region. Finally, and not surprisingly, indirect taxes exert an important adverse effect on the incidence of poverty, although in a magnitude that it is significantly lower than that of the positive contributions exerted by direct transfers.

The underlying significance of the previous results is that the net effect of fiscal interventions favors upward economic mobility, especially among the poorest. Of the total ultra-poor, 39 percent move to extreme poverty, 16 percent to moderate poverty, and 14 percent to vulnerability. Among those initially identified as extreme poor, 45 percent experience upward mobility to moderate poverty and 24 percent to vulnerability,

²⁹The official extreme and moderate poverty rates in 2013 are, respectively, 4.5 and 14.4 percent, and these figures are conceptually comparable with the poverty rates resulting from the Disposable Income concept in this chapter: 3.9 and 12.5 percent, respectively. The differences occur because the methodology implemented here includes near-cash transfers as part of direct transfers, whereas near-cash transfers are not considered in the income used by the Ministry of Social Development in the estimation of national poverty rates.

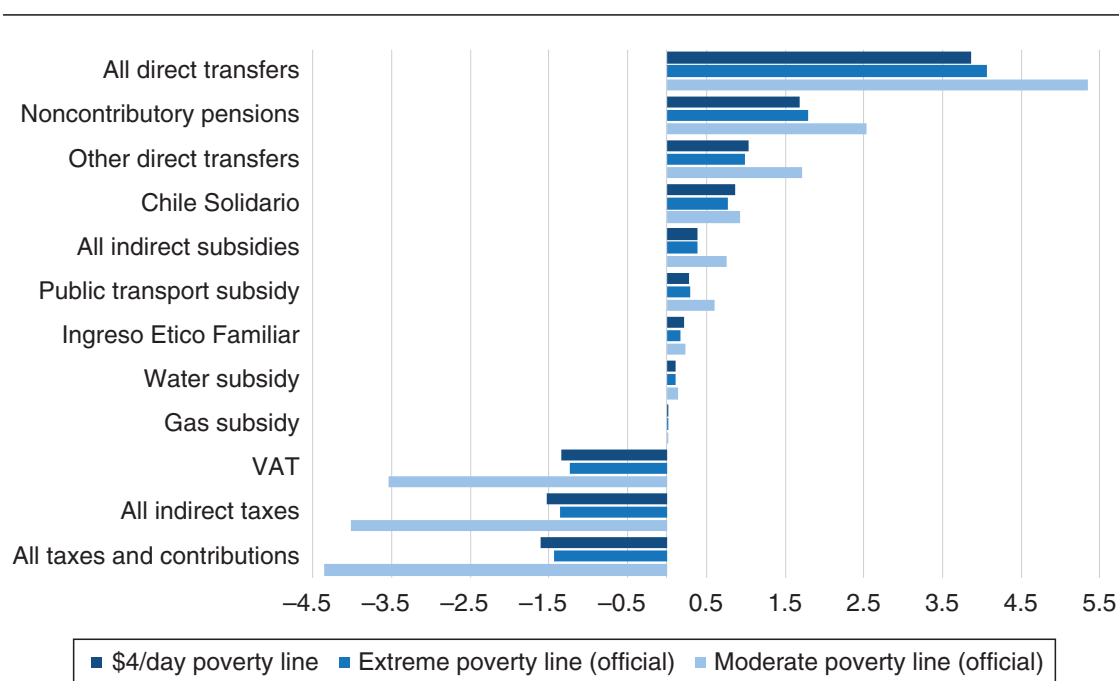
FIGURE 13-7
Effects of Fiscal Interventions on Poverty



Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016).

Notes: The indices measuring the incidence, intensity, and severity of poverty correspond to the FGT family of poverty indices (Foster, Greer, and Thorbecke, 1984). The incidence represents the percentage of population under the poverty line; the intensity index, also known as the poverty gap, measures the shortfall from the poverty line as a share of the same poverty line; and the severity index measures the magnitude of inequality among the poor.

FIGURE 13-8
Marginal Contributions of Fiscal Interventions to Poverty (percentage points)



Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016).

whereas 53 percent of the moderate poor exit poverty. Conversely, 2 and 6 percent of those initially identified as middle class and wealthy, respectively, experience downward mobility (table 13-3, panel A). A different way to appreciate the overall effect of fiscal policy is that if the country's population is reduced to 100 individuals, then the number of people living with less than \$4/day declines from 8 to 4; that of vulnerable increases from 32 to 34; that of middle class also increases, from 54 to 55; and that of the wealthy reduces from 7 to 6 individuals (table 13-3, panel B).

Overall, the net effect of fiscal interventions in Chile is both equalizing and poverty-reducing, yet the extent to which such interventions make the prefiscal poor either poorer or better off is unknown. In order to explore the extent to which a fiscal system like Chile's hurts and benefits the poor, Higgins and Lustig (2016)³⁰ developed a set of innovative measures to capture the magnitude of fiscal impoverishment (FI) and fiscal gains to the poor (FGP). The authors define an individual as fiscally impoverished if she is poor according to her postfiscal income (that is, after taxes and transfers) and such income is lower than her prefiscal income (that is, the amount paid in taxes is higher than the amount received in transfers). On the other hand, an individual experiences fiscal gains when he is poor according to his prefiscal income (that is, before taxes and transfers) and such income is lower than his postfiscal income (that is, the amount received in

³⁰ Reproduced as chapter 4 of this Handbook.

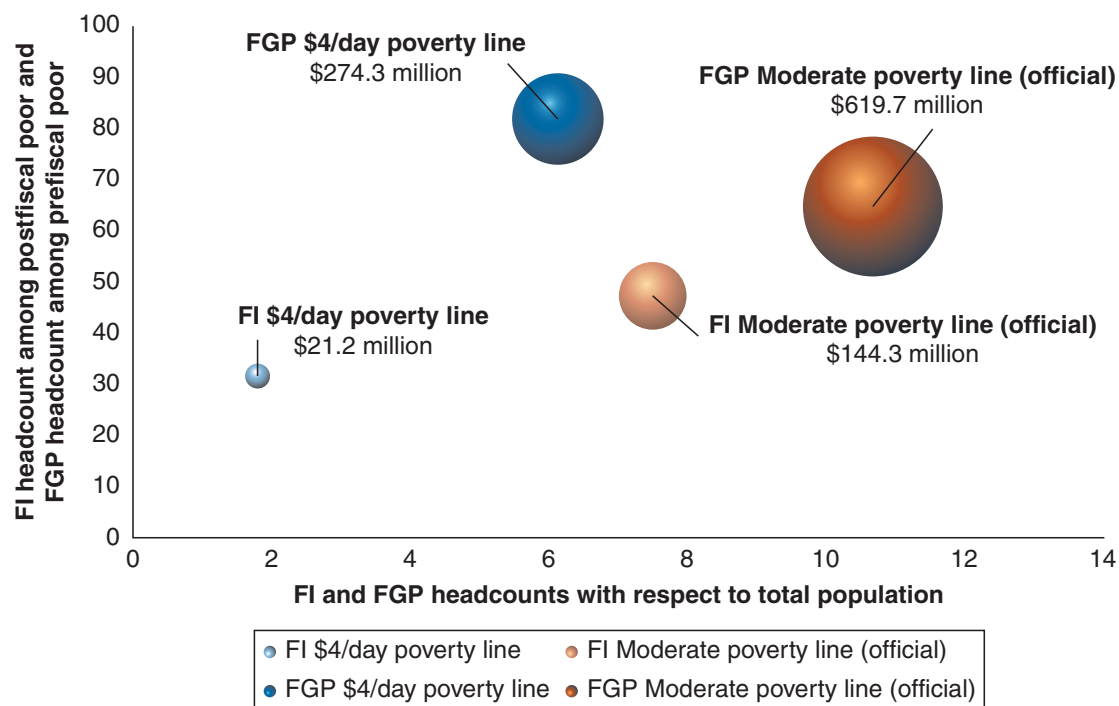
TABLE 13-3

Fiscal Mobility Matrices from Market Income plus Pensions to Consumable Income

		A. Row percentage distribution of population						
Initial/ending income concept and income groups		Consumable income					Total	
		Ultra-poor	Extreme poor	Moderate poor	Vulnerable	Middle class	Wealthy	
Market income plus pensions	Ultra-poor	30	39	16	14	0	—	100
	Extreme poor	—	31	45	24	0	—	100
	Moderate poor	—	0	47	53	0	—	100
	Vulnerable	—	—	0	93	7	—	100
	Middle class	—	—	—	2	98	0	100
	Wealthy	—	—	—	—	6	94	100
		B. Total percentage distribution of population						
Initial/ending income concept and income groups		Consumable income					Total	
		Ultra-poor	Extreme poor	Moderate poor	Vulnerable	Middle class	Wealthy	
Market income plus pensions	Ultra-poor	0.2	0.3	0.1	0.1	0.0	—	0.8
	Extreme poor	—	0.6	0.9	0.5	0.0	—	2.0
	Moderate poor	—	0.0	2.2	2.5	0.0	—	4.7
	Vulnerable	—	—	0.0	29.8	2.4	—	32.2
	Middle class	—	—	—	0.9	52.7	0.0	53.6
	Wealthy	—	—	—	—	0.4	6.3	6.6
Total	0.2	0.9	3.3	33.8	55.5	6.3	100.0	

Source: Authors' elaboration based on Martínez-Aguilar and Ortiz-Juárez (2016).

FIGURE 13-9
 Headcounts and Amounts of Fiscal Impoverishment and Fiscal Gains to the Poor
 (percentages of population and US\$ millions adjusted by PPP)



Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016).

Notes: The size of the bubbles is relative to the total monetary amounts of FI and FGP. The amounts are annual and expressed in millions of dollars adjusted by PPP at 2005 prices. The headcounts and amounts of FI and FGP for the official extreme poverty line are close to those for the \$4/day poverty line and are therefore excluded from the graph in order to avoid an overlapping of the bubbles.

transfers is higher than the amount paid in taxes). In addition to the headcounts, the monetary amounts of FI and FGP can be computed. The first amount equals the sum of the fall in income for the prefiscal poor, plus the difference between the poverty line and the income (also known as the poverty gap) for those prefiscal non-poor but postfiscal poor. The second amount is calculated as the sum of the increase in income for the prefiscal poor who remain poor after taxes and transfers, plus the prefiscal poverty gap for the prefiscal poor who escaped poverty after taxes and transfers.

Using both the \$4/day and official moderate poverty lines, figure 13-9 draws both the FI and FGP headcounts with respect to the country's population over the x-axis, whereas the y-axis reflects the FI headcount among the postfiscal (Consumable Income) poor and the FGP headcount among the prefiscal (Market Income plus Pensions) poor; the size of the bubbles is relative to the total monetary amounts of both FI and FGP. One finding is that fewer individuals are impoverished in comparison to the number of fiscal gainers after the intervention of taxes, subsidies, and direct transfers. Using the \$4/day poverty line, 1.8 percent of Chile's population (or 31.6 percent of the

postfiscal poor) are impoverished, whereas 6.1 percent of the total population (or 82 percent of the prefiscal poor) are fiscal gainers. If the official moderate poverty line is employed instead, the proportion of impoverished (7.5 percent of the total, or 47.1 percent of the postfiscal poor) is lower than that of the fiscal gainers (10.6 percent of the total, or 65.1 percent of the prefiscal poor). A second result is that the magnitude of annual fiscal gains (US\$274.3 million) is almost 13 times larger than that of FI (US\$21.2 million) when using the \$4/day poverty line, whereas the ratio is slightly above four times that when using the official moderate poverty line (with US\$619.7 million of FGP and US\$144.3 million of FI).³¹

The previous analysis yields an additional interesting finding. The 7.5 percent of Chile's population experiencing fiscal impoverishment—equivalent to nearly 1.3 million individuals whose postfiscal income is lower than both the official moderate poverty line and their prefiscal income—lives in 0.37 million households out of which 69 percent are not recipients of any of the main direct transfers analyzed, including Chile Solidario, Ingreso Etico Familiar, or noncontributory pensions. This is significant as 84 percent of the fiscal impoverished are members of households identified as poor according to the official definition.

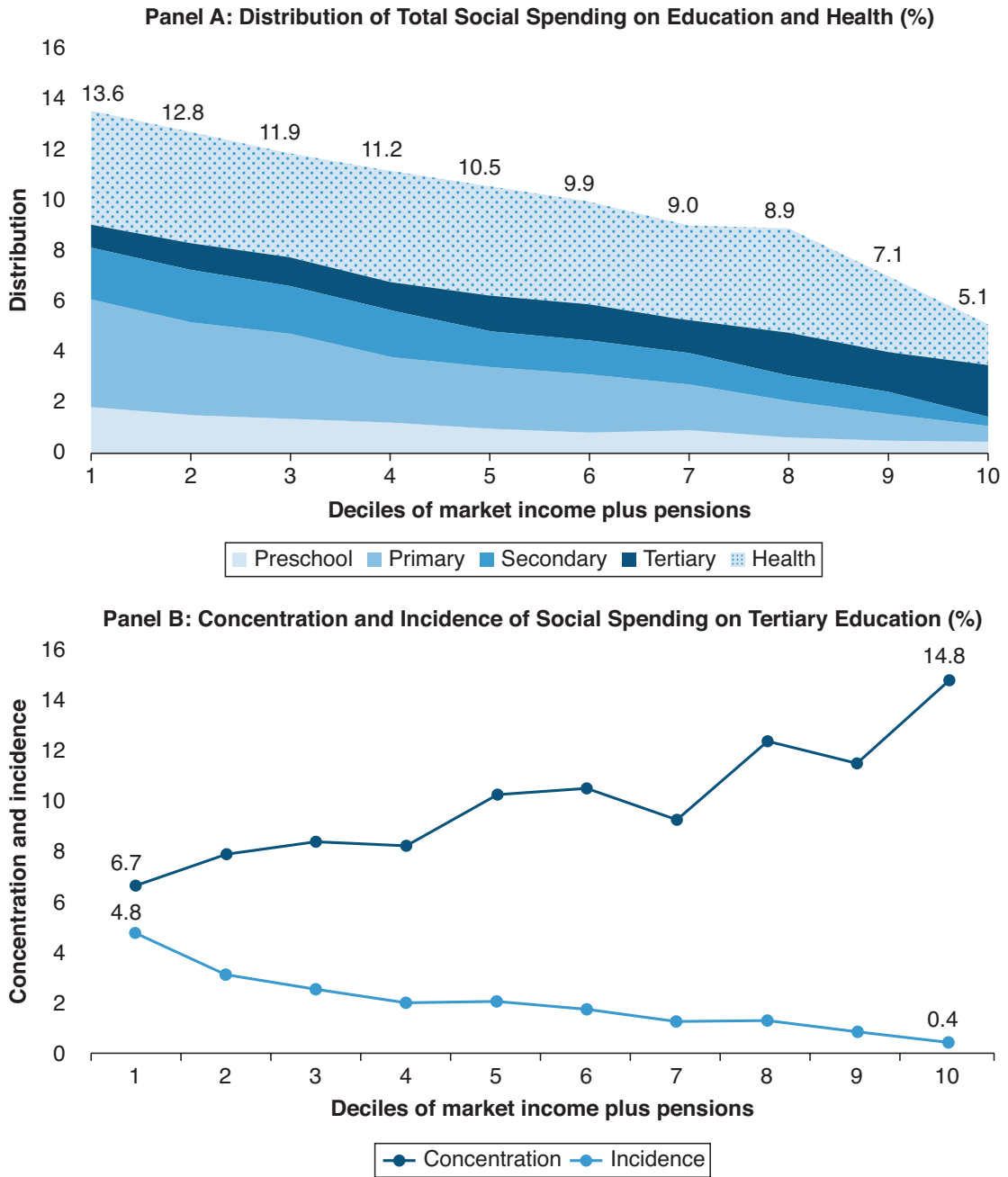
A last, fundamental question to resolve is who benefits more from Chile's social spending through in-kind transfers of education and health services? Figure 13-10, panel A, shows that the distribution of total social spending on education and health tends to fall with Market Income plus Pensions—that is, the share of total benefits received is higher the poorer the household. The first decile, comprised by the poor, receives 13.6 percent of total spending, whereas the tenth decile, comprised mostly by wealthy individuals, receives just above 5 percent. Moreover, half of total spending is distributed among the bottom 40 percent of Chile's population, which is composed entirely by poor and vulnerable individuals.³² That pattern holds when total spending is disaggregated by component, with the only exception being social spending on tertiary education, which seems disproportionately distributed among the upper deciles.

³¹ When using the \$4/day poverty line, these annual amounts are equivalent in Chilean pesos to roughly 137,700 million for fiscal gains and around 10,660 million for FI. For the official moderate poverty line the amounts are nearly 311,300 and 72,470 million of Chilean pesos, respectively. The headcounts and amounts of FI and FGP for the official extreme poverty line are relatively similar to those for the \$4/day poverty line. The proportion of impoverished reaches 1.6 percent of the total population (or 31.2 percent of the postfiscal poor), whereas that of fiscal gainers reaches 5.7 percent of the total population (or 82.9 percent of the prefiscal poor). Regarding the amounts, annual fiscal gains are US\$296.7 million (or roughly 149,000 million Chilean pesos) and annual FI is US\$19.2 million (or nearly 9,600 million Chilean pesos).

³² The values of the ultra-poor (\$1.25/day), extreme (\$2.5/day), and moderate (\$4/day) poverty lines lie, respectively, at the first, third, and eighth percentiles of the income distribution. The value of the \$10/day threshold dividing the vulnerable and the middle class lies at the fortieth percentile, whereas the \$50/day line dividing the middle-class and the wealthy lies at the ninety-fourth percentile.

FIGURE 13-10

Distribution of Total Social Spending on Education and Health and Concentration and Incidence of Social Spending on Tertiary Education (percentages by deciles of market income plus pensions)

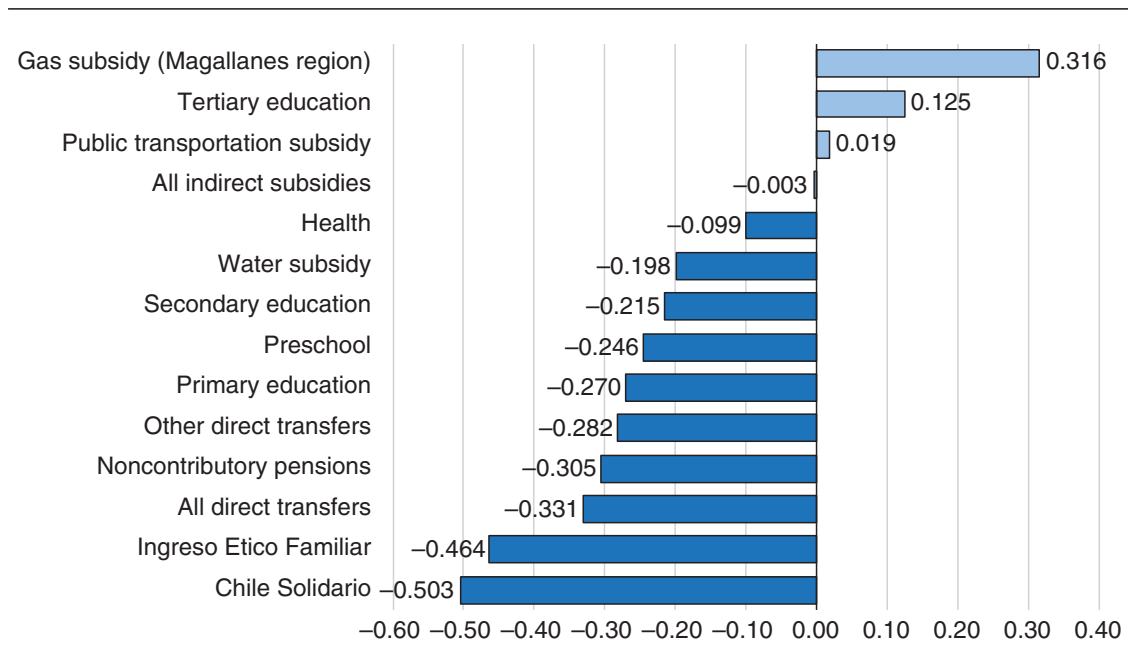


Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016).

Note: The sum of the areas measured in panel A equals 100 percent.

FIGURE 13-11

Concentration Coefficients of Social Spending and Public Spending on Subsidies



Source: Authors' elaboration based on Martinez-Aguilar and Ortiz-Juarez (2016).

In fact, when looking at its concentration, almost 15 percent of the total spending on tertiary education in Chile goes to the tenth decile, which is more than twice the share (6.7 percent) received by the bottom 10 percent of the population (figure 13-10, panel B). In terms of its incidence, when social spending on tertiary education is analyzed as share of income in each decile, this share is higher for the first decile (4.8 percent) than for the tenth decile (0.4 percent); the result, which is consistent with the positive marginal contribution to inequality (0.003) found previously, indicates that this component of social spending exerts a slightly equalizing effect.

While social spending on tertiary education is slightly equalizing, this intervention is not pro-poor as indicated by its positive concentration coefficient (figure 13-11). In fact, most of the interventions through public spending analyzed in this chapter are equalizing (positive marginal contributions). Among them, the most pro-poor (negative concentration coefficients) are direct transfers followed by primary education, preschool, and secondary education. The water subsidy and social spending on health are also somewhat pro-poor. In the case of the subsidy to public transportation, it is slightly equalizing but not pro-poor, whereas the subsidy to gas exerts a neutral effect on inequality (zero marginal contribution) and is also not pro-poor.³³ (The latter is not surprising given that the gas subsidy uses geographical targeting and does not consider the poverty status of the population.)

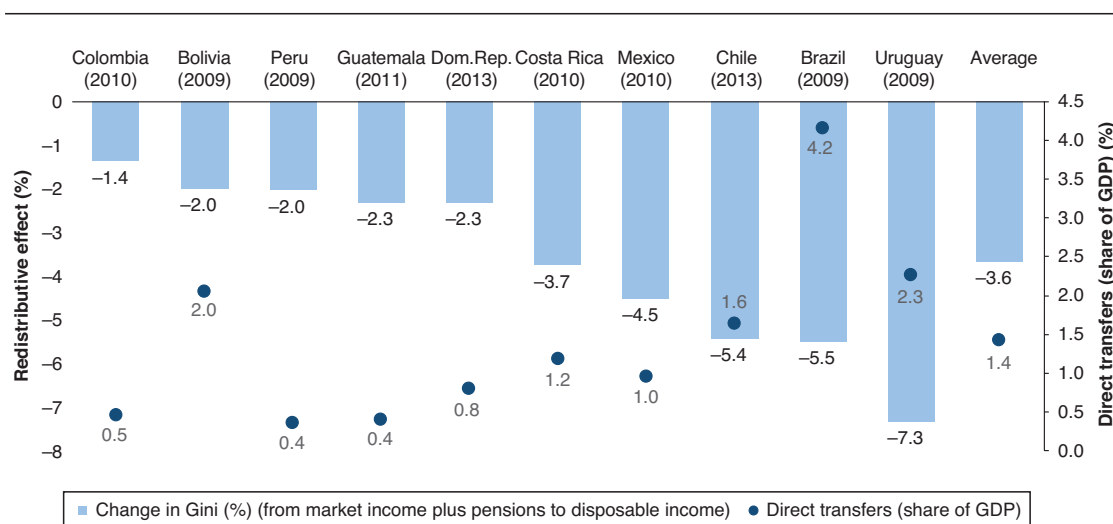
³³The concentration coefficients for all fiscal interventions analyzed are shown in table 13A-1 in the appendix.

3.2 Fiscal Redistribution in Chile: A Comparative Perspective

The redistributive effect of direct transfers, measured as the percent change in the Gini coefficient from Market Income plus Pensions to Disposable Income, is considerably larger in Chile (5.4 percent) than in other Latin American countries with a comparable fiscal incidence analysis: it is well above the average, and between 2.3 and 4 times larger than the effect found in the Dominican Republic, Guatemala, and the Andean countries. A salient result is that although spending on direct transfers as a share of GDP is lower in Chile (1.6 percent) than in Bolivia (2 percent), the redistributive gains are as much as 2.7 times larger in the former. Moreover, Chile achieves the same redistributive gains as Brazil (5.5 percent) with a significantly lower volume of direct transfers relative to GDP (figure 13-12). At the same time, however, Chile’s redistributive effect of direct transfers is well below the effect observed in Uruguay (7.3 percent), and in all the Eastern European countries shown in figure 13-13 for which the comparison is possible.

For instance, in Georgia, a country with a similar Gini coefficient for Market Income plus Pensions (0.483) as Chile’s (0.494), the redistributive effect reaches 18.4 percent after deducting (adding) direct taxes (transfers) from/to Disposable Income, placing the Gini coefficient at 0.349. The magnitude of the redistributive effect

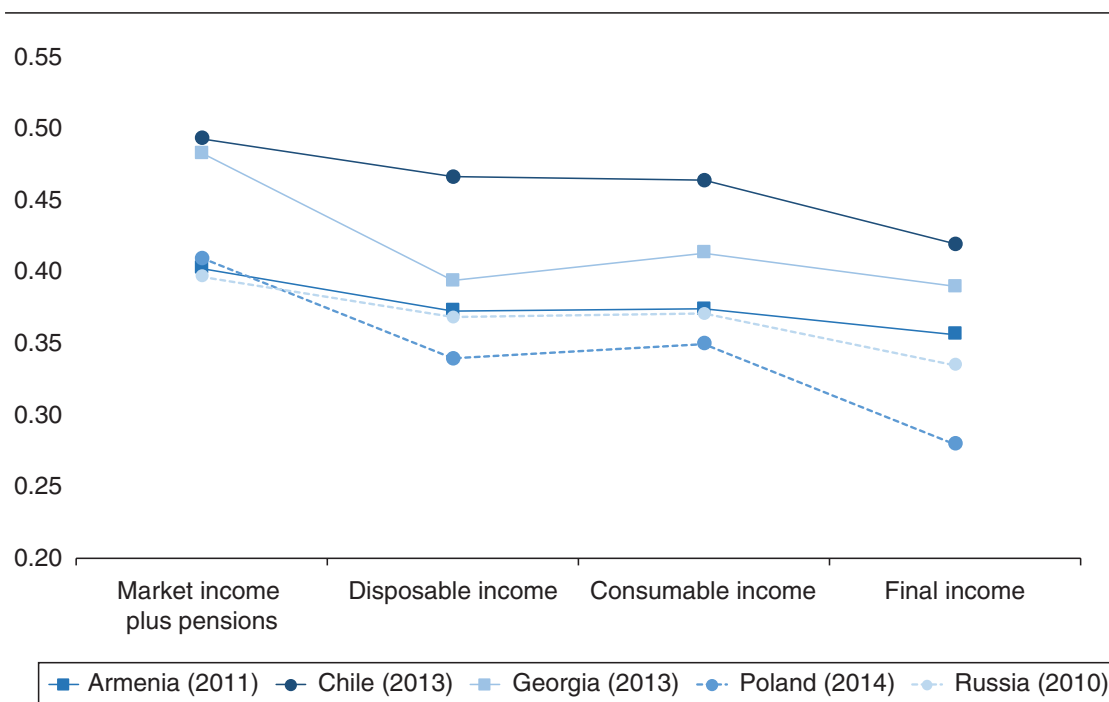
FIGURE 13-12
Redistributive Effects and Social Spending on Direct Transfers in Select Latin American Countries



Source: Authors’ elaboration based on the following works: Bolivia (Paz Arauco and others, 2014); Brazil (Higgins and Pereira, 2014); Chile (Martinez-Aguilar and Ortiz-Juarez, 2016); Colombia (Melendez and Martinez, 2015); Costa Rica (Sauma and Trejos, 2014); Dominican Republic (Aristy-Escuder and others, 2018); Guatemala (Cabrera and Moran, 2016); Mexico (Scott, 2014); Peru (Jaramillo, 2014); and Uruguay (Bucheli and others, 2014).

Notes: The year for which the country analysis was conducted is shown in parentheses in each bar of the graph. The average is the simple mean of the percent changes by country. The figures shown in the graph may differ slightly from those originally published in the works cited due to recent updates of the CEQ methodology.

FIGURE 13-13
Inequality Dynamics in Chile and Select Countries in Eastern Europe



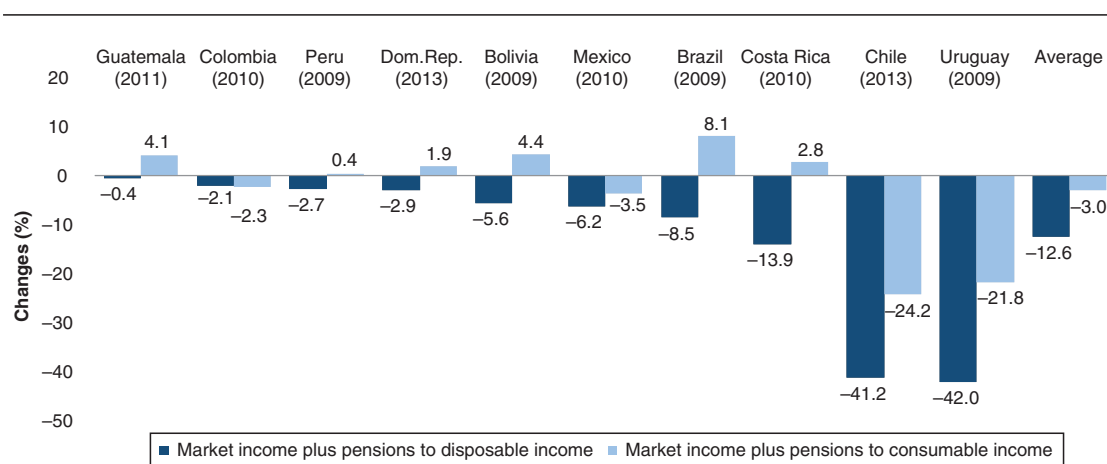
Source: Authors' elaboration based on the following works: Armenia (Younger and Khachatryan, 2017); Chile (Martinez-Aguilar and Ortiz-Juarez, 2016); Georgia (Cancho and Bondarenko, 2017); Poland (Goraus and Inchauste, 2016); and Russia (Lopez-Calva and others, 2017).

Note: The year for which the country analysis was conducted is shown in parentheses in each country label of the graph.

is also similar in Poland (17.1 percent), although this country exhibits a Gini coefficient for Market Income plus Pensions that is significantly lower (0.410). When social spending on education and health is considered, the inequality-reducing effect in Chile (15 percent)—relative to Market Income plus Pensions—surpasses that of Armenia (11.4 percent), is on par with that of the Russian Federation (15.6 percent), and remains well below the effect found in Georgia (19.3 percent) and Poland (31.7 percent). (It is worth noting that when moving from disposable to Consumable Income—for example, when considering indirect taxes and subsidies—only Chile exhibits a decline in the Gini coefficient, which is the result of the aforementioned Lambert's conundrum.)

Regarding the influence of direct transfers on poverty, figure 13-14 shows that they can reduce the incidence of poverty in Chile by 41.2 percent with respect to the Market Income plus Pensions concept, a change that is similar to that observed in Uruguay (42 percent) and threefold the average of the selected Latin American countries (12.6 percent). The intervention of indirect taxes and subsidies in Chile halves the magnitude of such reduction (24.2 percent), although it remains large enough to position

FIGURE 13-14
Poverty-Reducing Effects in Select Latin American Countries



Source: Authors' elaboration based on the following works: Bolivia (Paz Arauco and others, 2014); Brazil (Higgins and Pereira, 2014); Chile (Martinez-Aguilar and Ortiz-Juarez, 2016); Colombia (Melendez and Martinez, 2015); Costa Rica (Sauma and Trejos, 2014); Dominican Republic (Aristy-Escuder and others, 2018); Guatemala (Cabrera and Moran, 2016); Mexico (Scott, 2014); Peru (Jaramillo, 2014); and Uruguay (Bucheli and others, 2014).

Notes: The incidence of poverty is measured according to the \$4/day poverty line. The year for which the country analysis was conducted is shown in parentheses in each bar of the graph. The average is the simple mean of the percent changes by country. The figures shown in the graph may differ slightly from those originally published in the works cited due to recent updates of the CEQ methodology.

Chile as the best performer among the Latin American countries with a comparable assessment. In startling contrast, in countries like Bolivia, Brazil, Costa Rica, the Dominican Republic, and Guatemala, the effect of indirect taxes and subsidies on poverty more than compensates for the gains from direct transfers.

4 Conclusions

The results from the fiscal incidence analysis presented here indicate, in general, that fiscal interventions in Chile exert a positive net effect in reducing poverty and inequality and favor upward economic mobility, especially among the poorest. In particular, subsidies for public transportation and water exert a positive, yet modest effect on poverty and inequality, whereas the effects of gas subsidy are mostly neutral. Direct transfers are progressive (that is, the benefits as share of prefiscal income decline with income), as well as equalizing and poverty-decreasing (that is, direct transfers show positive marginal contributions to both inequality and poverty). In terms of their effect on poverty, for instance, direct transfers reduce the incidence by 4–5 percentage points, depending on the poverty line used, with noncontributory pensions and the flagship cash transfer scheme (Chile Solidario, Ingreso Etico Familiar) accounting for the lion's share of such reduction. Direct transfers are also pro-poor, as indicated by

their negative concentration coefficient (for example, per capita benefits from direct transfers decline with income).

On the other hand, direct taxes on personal income are found to be equalizing and poverty-neutral; social contributions are unequalizing and poverty increasing; and indirect taxes are poverty increasing, but they exert a slight equalizing effect. This counterintuitive result (the so-called Lambert's conundrum) occurs because indirect taxes, although regressive relative to prefiscal income (Market Income plus Pensions), are found to be progressive with respect to the less unequally distributed post-transfer income (Disposable Income). In other words, indirect taxes exert an equalizing effect over and above the effect exerted by progressive direct taxes and direct transfers. As discussed by Enami, Lustig and Aranda in chapter 2 of this Handbook, the latter is not equivalent to ascertaining that regressive taxes can be fine as long as the net effect of the whole fiscal system is equalizing; rather, it means that such net effect with a regressive tax, relative to pre-fiscal income, can be more equalizing than without the tax.

Regarding in-kind transfers in the form of education and health, all the interventions are equalizing, with social spending on primary and secondary education and on health having the largest effect on inequality. The latter is not surprising given that Chile spends more on education and health (8.1 percent of the country's GDP) than in direct transfers (1.6 percent). Yet, this result must be interpreted with caution because in-kind transfers are monetized at average government cost, which does not necessarily reflect the actual value of the education and health services provided, and there are no adjustments for differences in quality across the distribution. It is important to emphasize that although social spending on tertiary education is slightly equalizing, this intervention is not pro-poor as indicated by its positive concentration coefficient. Conversely, social spending on basic (preschool and primary) and secondary education and health is not only equalizing but also pro-poor (negative concentration coefficients).

Four additional results are worth noting. First, after the intervention of taxes, subsidies, and direct transfers, not only is the incidence of poverty reduced, but also the depth of poverty and the magnitude of inequality among the poor decrease remarkably. Second, when using the official moderate poverty line, the net effect of the whole fiscal system leaves fewer individuals impoverished (7.5 percent of Chile's population, or 47.1 percent of the postfiscal poor) in comparison to the number of fiscal gainers (10.6 percent of the total, or 65.1 percent of the prefiscal poor), and the magnitude of monetary fiscal gains is as much as four times larger than that of fiscal impoverishment. Third, the 7.5 percent of Chile's population that experiences fiscal impoverishment lives in 0.37 million households out of which the 69 percent are not recipients of any of the main direct transfers analyzed. This is significant as 84 percent of the fiscally impoverished are members of households identified as poor according to the official definition; it also indicates that additional efforts are required to improve the

targeting and expand the coverage of direct transfers among the poor population, in particular because direct transfers have a considerable effect on reducing inequality and poverty.

Finally, when put into a regional perspective, the redistributive effect of direct transfers (that is, the decline in inequality from prefiscal income to post-transfers income) is particularly greater in Chile than in other Latin American countries with a comparable fiscal incidence analysis. A remarkable result is that with 1.6 percent of the GDP being spent on direct transfers, the redistributive gains in Chile are as much as 2.7 times larger than in Bolivia, where direct transfers account for 2 percent of the GDP, and virtually the same as in Brazil, where they account for 5.5 percent of the GDP. In terms of the effect on poverty, as measured by the \$4/day poverty line, direct transfers in Chile reduce the incidence by 41.2 percent with respect to prefiscal income, placing the country as a top performer in the region.

As part of its efforts to address persistently high levels of income inequality, the government of Chile enacted a comprehensive tax reform in 2014 aimed at generating additional tax revenues (amounting to around 3 percent of the GDP) to finance social spending, especially on education; improving neutrality and equity of the tax system; improving the efficiency of tax incentives on savings and investment; and reducing tax evasion and avoidance.³⁴ Even though the effect of such reform is not quantified in this chapter, further spending on education could potentially contribute to income inequality decline in the medium and long term. Moreover, an *ex ante* evaluation of the reform using the 2013 fiscal records suggested that the tax reform would likely increase the effective tax burden for the top 1 percent of the income distribution by 6 percentage points (equivalent to an increase from 2.4 to 3.5 percent of the GDP, with 80 percent of the latter figure being paid by the top 0.1 percent), while for most of the population the tax burden is expected to remain roughly constant, thereby eventually making the tax system more progressive.³⁵

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³⁴ Arenas de Mesa (2016).

³⁵ World Bank (2016).

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