

The Redistributive Impact of Government Spending on Education and Health: Evidence from Thirteen Developing Countries in the Commitment to Equity Project

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INTRODUCTION

Two key indicators of a government's (or society's) commitment to equalizing opportunities and reducing poverty and social exclusion are the share of total income devoted to social spending and how equalizing and pro-poor this spending is (Lindert 2004; Barr 2012). Typically, redistributive social spending includes cash benefits¹ and benefits in kind such as spending on education and health.² This chapter examines the level, redistributive impact, and pro-poorness of government spending on education and health for 13 developing countries from the Commitment to Equity (CEQ) project:³ Armenia, Bolivia, Brazil, Chile, Colombia, El Salvador, Ethiopia, Guatemala, Indonesia, Mexico, Peru, South Africa, and Uruguay.⁴

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¹“Cash” benefits typically include cash transfers and near-cash transfers such as school feeding programs and free uniforms and textbooks. Depending on the analysis, cash benefits also include consumption subsidies (for example, on food) and energy consumption and housing subsidies. The studies included here include cash and near-cash transfers as well as (in most cases) consumption subsidies. Housing subsidies are not included.

²Social spending as a category frequently includes spending on pensions funded by contributions. Following Lindert 1994, this analysis does not include them. Strictly speaking, one should include the subsidized portion of these pensions as part of redistributive social spending (for example, the portion of contributory pensions that is paid out of general revenues and not from contributions). However, estimates of these subsidies are hard to produce. As an alternative, the results for the scenario in which contributory pensions are treated as a government transfer and part of social spending are available upon request. Noncontributory pensions (also known as social or minimum pensions) are treated as any other cash transfer.

³Led by Nora Lustig since 2008, the CEQ project is an initiative of the Center for Inter-American Policy and Research (CIPR) and the Department of Economics, Tulane University, the Center for Global Development and the Inter-American Dialogue. For more details, visit www.commitmenttoequity.org.

⁴The selected countries are not meant to be a representative sample of the developing world. The analysis is based on the country studies that have been undertaken and fully completed under the CEQ project as of January 2015. Because the project first started in Latin America, countries from this region make up nine of the thirteen. The authors of the country studies are Armenia (Younger and Khachatryan 2014), Bolivia (Paz Arauco and others 2014), Brazil (Higgins and Pereira 2014), Chile (Ruiz-Tagle and Contreras 2014), Colombia (Melendez 2014), El Salvador (Beneke, Lustig, and Oliva 2014), Ethiopia (Hill, Tsehaye, and Woldehanna 2014), Guatemala (Cabrera, Lustig, and Morán 2014), Indonesia (Afkar, Jellema, and Wai-Poi forthcoming), Mexico (Scott 2014), Peru (Jaramillo 2014), South Africa (Inchauste and others 2014), and Uruguay (Bucheli and others 2014). Note that updated figures posted on the CEQ website may differ from those in the chapter; overall results and conclusions remain intact.

This chapter makes two important contributions. First, results are comparable across countries because the 13 studies apply a common methodology. Second, because the fiscal incidence analysis is comprehensive, the contribution of in-kind benefits (in the form of education and health care services) to the overall reduction in inequality can be estimated. In particular, the analysis addresses the following questions: Does government spending on education and health increase with per capita income and income inequality across the countries included here? Do more unequal societies redistribute more? What is the contribution of spending on education and health to the overall reduction in inequality? How pro-poor is spending on education (total and by level) and health? Information from administrative accounts and the fiscal incidence estimates generated in the country studies is used to answer these questions.

Examining the redistributive impact and pro-poorness of education and health spending requires attaching a value to the benefit to an individual of attending a public school or receiving health care in a public facility for free (or almost free). Conceptually, attaching a value to in-kind benefits—free government services—is complex (for example, Lambert 2001). One frequently used (and imperfect) approach is to value services at the average cost of provision.⁵ This is the method used here. Such an approach ignores the fact that consumers may value services quite differently from what they cost. Given the limitations of available data, however, the cost-of-provision method is the best for now.⁶

To calculate the contribution of spending on education and health to the overall reduction in inequality, estimates are also needed of the incidence of other fiscal interventions: direct and indirect taxes, direct transfers, and indirect subsidies. This analysis uses the fiscal incidence results analyzed by Lustig, Pessino, and Scott (2014) and Lustig (forthcoming).⁷ The fiscal incidence method is described in detail by Lustig and Higgins (2013) and follows what is known as the “accounting approach.”⁸

The progressivity and pro-poorness of education and health spending are determined based on the size and sign of the relevant concentration coefficient. In keeping with generally accepted convention, spending is regressive when the concentration coefficient is *higher* than the market-income Gini. Spending is progressive when the concentration coefficient is *lower* than the market-income Gini. Spending is pro-poor when the concentration coefficient is not only lower than the market-income Gini, but also has a negative value.⁹ A negative concentration coefficient implies that *per capita* spending tends to be higher the poorer the individual.¹⁰ When the concentration coefficient equals zero, per capita spending is the same across the distribution: spending is neutral in absolute terms. By definition, government spending that is pro-poor (or neutral in absolute terms) is also progressive. However, not all government spending that is progressive is pro-poor.

The findings can be summarized as follows. Total social spending—cash transfers plus education and health spending—as a share of GDP is high by historical standards and it increases with gross national income (GNI) per capita. Health spending as a share of GDP increases with GNI

⁵ This approach goes back quite a long time. See, for example, Meerman 1979; Selowsky 1979; Demery and others 1995; Demery, Dayton, and Mehra 1996; and Sahn and Younger 2000.

⁶ By using averages, the method also ignores differences across income groups and regions: for example, governments may spend less (or more) per pupil or patient in poorer areas of a country. Some studies in the CEQ project adjusted for regional differences. For example, Brazil's health spending was based on region-specific averages.

⁷ See the country-specific sources in footnote 4.

⁸ As with any standard fiscal incidence analysis, the studies do not incorporate behavioral, life-cycle, or general equilibrium effects. However, the fiscal incidence of taxes and benefits is not generated by a mere mechanical application of statutory rates; the analysis incorporates assumptions regarding economic incidence, tax evasion, informality, and the reach of transfer programs.

⁹ Implicit in the rankings is the assumption that concentration curves do not cross.

¹⁰ This does not need to happen at every income level. A concentration coefficient will be negative as long as the concentration curve lies above the diagonal.

per capita while education spending does not. Spending on primary education as a share of GDP is roughly the same at different GNI per capita levels. Spending on secondary education as a share of GDP, however, rises with income per capita. The share of spending on tertiary education declines with GNI per capita. Social spending and spending on education and health as a share of GDP increase with market income (before taxes and transfers) inequality.

Do more unequal countries redistribute more? Results suggest that the answer is yes. Consistent with the prediction of the Meltzer-Richard median voter hypothesis (Meltzer and Richard 1981), more unequal countries reduce inequality by more whether that inequality is measured in absolute (percentage points) or relative (in percent) terms. This is an interesting result, not least because it differs from what has been found by historical research (Lindert 2004) and some of the contemporary studies (Luebker 2014). This result is not just driven by the fact that richer countries (in this sample) tend to be more unequal and, because they are richer, these countries also have more capacity to raise revenues and afford higher levels of spending. Regressing the change in the Gini on the Gini before redistribution shows that the coefficient is positive (albeit not always significant), even if GNI per capita is controlled for.

What contribution does spending on education and health make to the overall reduction in inequality? The overall reduction in inequality is defined as the difference between the market-income Gini and the Gini obtained after direct and indirect taxes, cash transfers, subsidies, and in-kind transfers in education and health.¹¹ In the literature, this is called the redistributive effect of the net fiscal system.¹² Education and health spending (combined) lowers inequality by a significant amount, and its marginal contribution to the overall decline in inequality is, on average, 69 percent.

How progressive and, especially, pro-poor is spending on education (total and by level) and health? Total spending on education is pro-poor in nine countries, and education spending per capita is roughly the same across the income distribution in three. Only in Ethiopia, by far the poorest and most equal country, is education spending progressive but not pro-poor. Spending on preschool, primary, and secondary education is pro-poor except in Ethiopia. Spending on tertiary education is regressive in three countries and progressive but not pro-poor in ten. Health spending is pro-poor in five countries. Of the remaining eight, health spending per capita is roughly equal across the income distribution in three and progressive (but not pro-poor) in five. There is some evidence that the progressivity and pro-pooriness of education and health spending has increased over time.

The chapter is organized as follows: First, the patterns of spending on education and health are analyzed with respect to income per capita and market-income inequality. A brief description of the fiscal incidence methodology is then provided. The impact of education and health spending on the overall decline in inequality is considered. Finally, the progressivity and pro-pooriness of education and health spending are examined.

PER CAPITA INCOME, INEQUALITY, AND SOCIAL SPENDING

Education and Health Spending and Per Capita Income

Does government spending on education and health increase with per capita income and income inequality across the countries included here? Figure 16.1 shows primary spending,¹³ total social spending, spending on education, and spending on health as a share of GDP on the vertical axis

¹¹ In the CEQ project, this is called “final income.”

¹² In the absence of reranking, this is identical to the Reynolds-Smolensky index for the net fiscal system. The redistributive effect can be measured using other inequality indicators such as the Theil index or varieties of the “Kuznets ratio.” Results for the latter are available upon request.

¹³ Primary spending equals total government spending minus interest payments on domestic and external public debt.

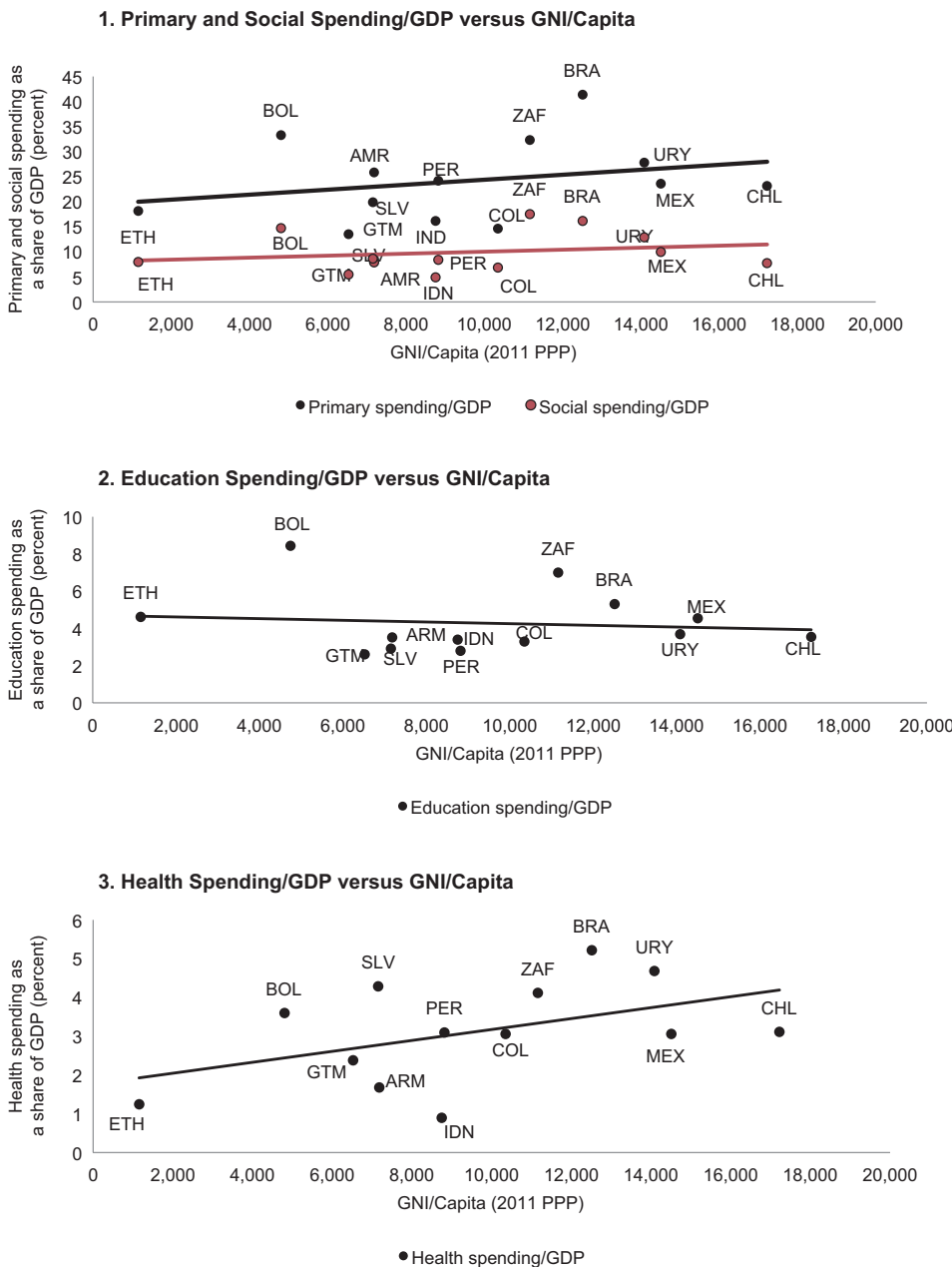


Figure 16.1 Primary, Social, Education, and Health Spending and GNI per Capita, circa 2010

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehaye, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: GNI = gross national income; PPP = purchasing power parity. Primary spending equals total government spending minus interest payments on domestic and external public debt. Social spending is defined as the sum of direct transfers and public spending on education and health (contributory and noncontributory). It does not include housing subsidies. Direct transfers here do not include contributory pensions. The spending shares and GNI per capita figures correspond to the year of the household survey: Armenia, 2011; Bolivia, 2009; Brazil, 2009; Chile, 2009; Colombia, 2010; El Salvador, 2011; Ethiopia, 2011; Guatemala, 2010; Indonesia, 2012; Mexico, 2010; Peru, 2009; South Africa, 2010–11; Uruguay, 2009. The data labels in the figure use International Organization for Standardization (ISO) abbreviations. Note that the numbers included in this section are those provided by the authors of the individual studies based on government statistics. The numbers do not necessarily match those found in “bulk” databases such as the World Bank’s World Development Indicators database, those of the IMF, the OECD’s Social Expenditure Database (SOEX), or databases of other institutions that form part of the United Nations system broadly defined. Definitions of categories may vary too.

and GNI per capita (in purchasing power parity) on the horizontal axis for the 13 countries. Note that social spending is defined as the sum of direct transfers and public spending on education and health (contributory and noncontributory). It does not include housing subsidies. Also, direct transfers here do *not* include contributory pensions from the government social insurance program. In all the analysis presented here, contributory pensions are treated as part of market income. In an alternative specification, the analysis assumes that contributory pensions are a direct government transfer. The results are very similar so are not included here.¹⁴

Total social spending and spending on public health as a share of total income rise with GNI per capita (Figure 16.1). This result is consistent with what has been found in the literature on the evolution of the welfare state.¹⁵ The share of spending on education, however, has a negative slope. This result is mainly driven by Bolivia, an outlier in the bunch; if Bolivia is removed, the slope becomes slightly positive. If disaggregated by educational level, spending on primary education is roughly the same at different levels of GNI per capita. Spending on secondary education, however, rises with income per capita, and spending on tertiary education declines.¹⁶

Both the size of the total budget (measured here by primary spending as a share of GDP) and social spending are quite heterogeneous across countries. Brazil, South Africa, and, in particular, Bolivia (given its lower-middle-income status) stand out as countries with relatively large governments and more fiscal resources devoted to social spending. However, these three countries are not the ones that devote the largest shares of their budgets (measured by primary spending) to spending on education and health. Colombia, with 43 percent of its budget allocated to education and health, is the leader of this group. In Brazil, in contrast, education and health spending comprises only 25 percent of primary spending, one of the lowest shares allocated to these two items in this sample of countries. Armenia has the lowest share of spending on education and health, allocating just one-fifth of its budget. Bolivia and South Africa allocate 36 percent and 34 percent of their budgets, respectively, to education and health spending.

The composition of social spending also exhibits quite a bit of heterogeneity, with some governments devoting larger shares to education and others to health (Figure 16.2). For example, El Salvador spends a larger share of GDP on health (4.3 percent) than on education (2.9 percent), but Indonesia spends close to nothing on health (0.9 percent).

One interesting fact is that Ethiopia—a low-income country and by far the poorest and most equal of the 13—devotes more than 7 percent of its GDP to social spending. This contrasts starkly with how much redistributive spending occurred in the now developed world when it was as poor as Ethiopia is today. Based on Angus Maddison's (Maddison 2010) estimates, Western Europe was as poor as today's Ethiopia (in per capita 1990 Geary-Khamis international dollars) somewhere around the seventeenth century. According to Lindert (2004, 7), by the end of the eighteenth century, today's rich countries spent close to nothing on social programs:

In 1776, . . . the modern age of social spending had not yet dawned. People paid hardly any taxes for the social programs that take such a large tax bite from paychecks today. Most poor people received negligible help from anybody. The elderly received no public pensions, mainly because few people survived to be elderly and average working incomes were too low to support many dependents. Most children did not go to school, and parents had to pay for those who did.

¹⁴The analysis in which contributory pensions are considered a government transfer is available upon request.

¹⁵For example, see Lindert 1994, 2004 and the work cited therein.

¹⁶Keeping in mind all the caveats of a single-variable regression and the small size of the sample, the elasticity of social spending with respect to income per capita equals 1.14; the elasticities for education and health are 0.98 and 1.44, respectively. The coefficients are significant for $p < 0.01$. Note that this regression uses a sample of 17 countries for which data on social spending were available. In addition to the 13 analyzed in this chapter, the regression includes Costa Rica, Ecuador, Jordan, and Sri Lanka.

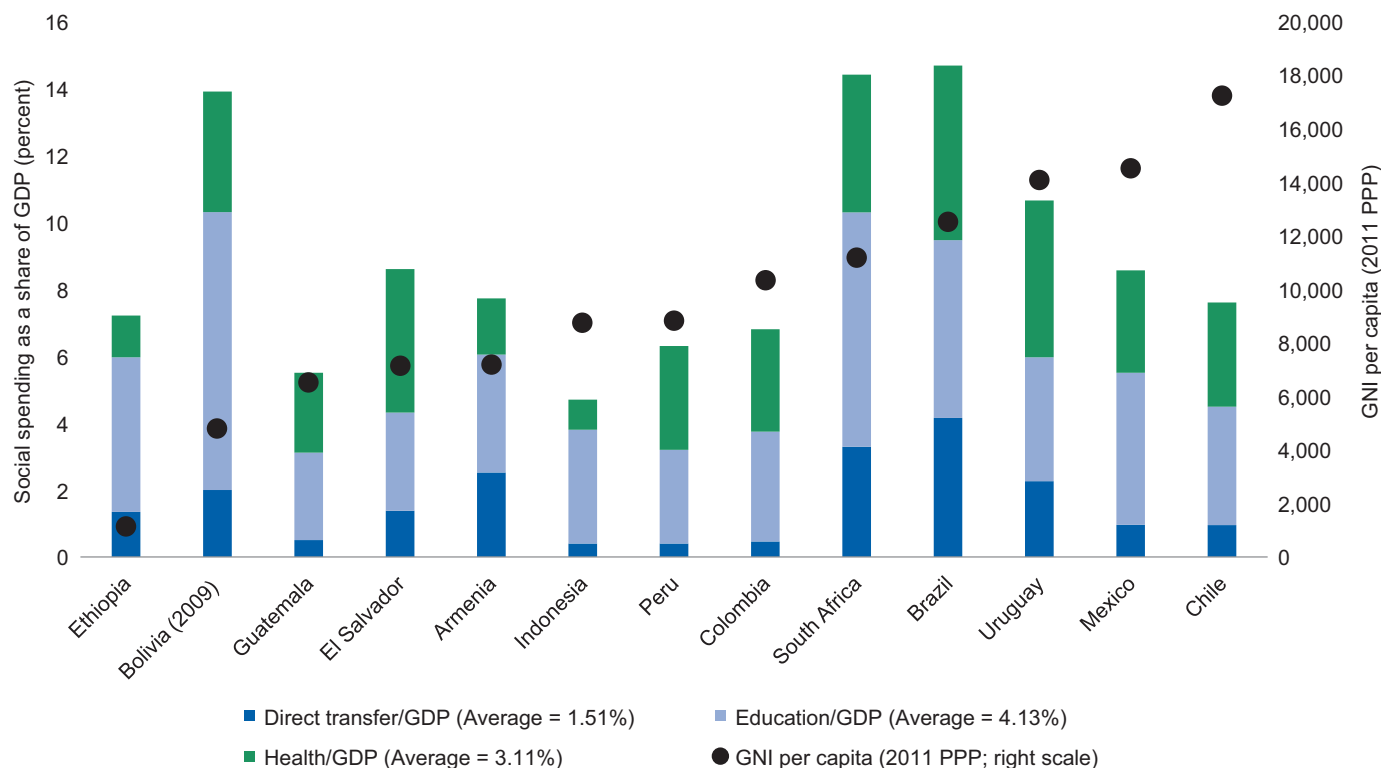


Figure 16.2 Composition of Social Spending, circa 2010

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehaye, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: GNI = gross national income; PPP = purchasing power parity. Social spending here is defined as the sum of direct transfers and public spending on education and health (contributory and noncontributory). It does not include housing, food, energy, or any other subsidies. Direct transfers here do not include contributory pensions. The spending shares and GNI per capita figures correspond to the year of the household survey: Armenia, 2011; Bolivia, 2009; Brazil, 2009; Chile, 2009; Colombia, 2010; El Salvador, 2011; Ethiopia, 2011; Guatemala, 2010; Indonesia, 2012; Mexico, 2010; Peru, 2009; South Africa, 2010–11; Uruguay, 2009. The data labels in the figure use International Organization for Standardization (ISO) abbreviations.

Around 2010, the ratio of public education spending to GDP ranges from 2.6 percent in Guatemala to 8.3 percent in Bolivia. Ethiopia, the poorest country in the sample, devotes 4.6 percent of its GDP to education. The countries that spend the least are Guatemala, Peru, and El Salvador, at 2.6, 2.8, and 2.9 percent of GDP, respectively. According to Angus Maddison's estimates, in 1990 international dollars, El Salvador's GDP per capita in 2008 was similar to that of the United States in 1880, and Guatemala's and Peru's were similar to the United States' around 1900. The United States, a pioneer in public education, devoted 0.74 percent of GDP in 1880 and 1.24 percent in 1900 (Appendix C in Lindert 2004). That is, the three lowest spenders on public education in this chapter spent more than twice the amount spent by the United States when it was approximately equally poor. Sweden was as rich as today's El Salvador around 1910, at which time Sweden spent 1.26 percent of GDP on public education, or about half as much as El Salvador today.

Government spending on health circa 2010 ranges from 0.9 percent of GDP in Indonesia to 5.2 percent in Brazil; the figure for Ethiopia is 1.25 percent. When the United States (around 1900) was as rich as Indonesia in the early twenty-first century (2008), it spent about 0.17 percent of GDP in government subsidies for health care (Table 1D in Lindert 1994). When the United States was as rich as Brazil was in 2008, it spent 0.4 percent.¹⁷

Lindert argues that the three main forces behind the rise of tax-based social spending from the late nineteenth century onward can be "linked to three other great social transformations: the transition to fuller democracy, the demographic transition. . . , and the onset of sustained economic growth" (Lindert 2004, 20). The fact that social spending is comparatively higher in the 13 developing countries analyzed here indicates that the (socially, politically, and economically) acceptable floor has been raised. One clear difference is that all 13 countries have universal suffrage whereas when present-day rich countries were equally poor, women were not allowed to vote (or there were restrictions to their vote). Thus, this chapter's findings are consistent with one of Lindert's explanatory variables for the rise in tax-based social spending, that is, fuller democracy. However, the world experienced another change during the twentieth century: the rise in domestic and external government borrowing and in official and private foreign aid. Ethiopia, for example, receives about 3 percent of GDP in grants.

Social Spending and Inequality

One of the most important findings in Lindert's (2004) path-breaking work is that both across countries and over time, resources devoted to the poor are lower in the nations in which poverty and inequality are greater. As shown in Figure 16.3, total social spending and spending on education and health as a share of GDP increase with income inequality (measured here by the Gini coefficient). This would seem to contradict earlier findings discussed by Lindert. Are the results mainly driven by South Africa? If South Africa is removed from the analysis, total social spending's line becomes flatter, education spending's line becomes horizontal, and health spending's line stays more or less the same.¹⁸ In addition, a larger share of resources devoted to

¹⁷ The United States in about 1925 was as rich as Brazil in 2008. The health spending figure corresponds to 1920 (Lindert 1994).

¹⁸ South Africa's market-income Gini may appear higher than in other sources such as the World Bank World Development Indicators (POVCAL) database, which shows a Gini equal to .6502 for 2012 (<http://iresearch.worldbank.org/PovcalNet/index.htm?2>). However, published inequality figures use expenditures (such as in the World Bank's World Development Indicators) or disposable income, and not market income. In the CEQ study for South Africa (Inchauste and others 2015), the Gini for per capita disposable household income is 0.6944, in line with other sources. For example, Leibbrandt and others (2010, Table 2.6) show a Gini of 0.70 for 2008.

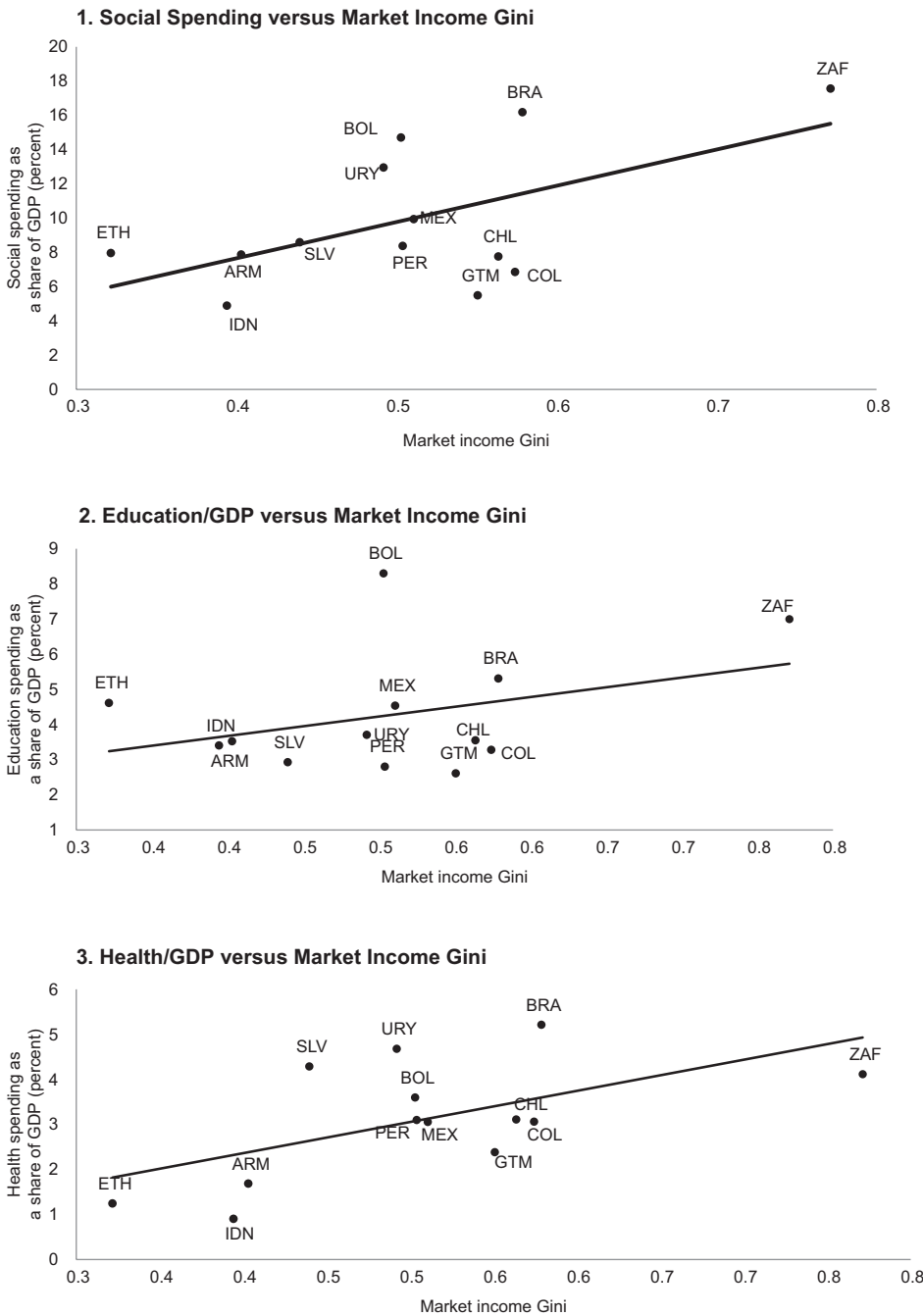


Figure 16.3 Social Spending and Income Inequality, circa 2010

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehaye, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: The spending shares and the Gini coefficients correspond to the year of the household survey: Armenia, 2011; Bolivia, 2009; Brazil, 2009; Chile, 2009; Colombia, 2010; El Salvador, 2011; Ethiopia, 2011; Guatemala, 2010; Indonesia, 2012; Mexico, 2010; Peru, 2009; South Africa, 2010–11; Uruguay, 2009. The Gini coefficients for Ethiopia and Indonesia are calculated using expenditure per capita; for the rest of the countries, they are calculated using income per capita. The data labels in the figure use International Organization for Standardization (ISO) abbreviations.

education and health does not indicate that governments are spending more resources on the poor. This will depend on the distribution of this spending, a question turned to below.

FISCAL INCIDENCE ANALYSIS: METHODOLOGICAL HIGHLIGHTS

Fiscal incidence analysis is used to assess the distributional impacts of a country's taxes and transfers.¹⁹ Essentially, fiscal incidence analysis consists of allocating taxes and public spending (social spending in particular) to households or individuals so that incomes before taxes and transfers can be compared with incomes after taxes and transfers. Transfers include both cash transfers and benefits in kind such as free government services in education and health care.

In general, fiscal incidence exercises are carried out using household surveys, as is done here.²⁰ As with any fiscal incidence study, this analysis starts by defining the basic income concepts. Three are used here: market, postfiscal, and final income.²¹ *Market income*²² is total current income before direct taxes, equal to the sum of gross (pretax) wages and salaries in the formal and informal sectors (also known as earned income), income from capital (dividends, interest, profits, rents, and so on) in the formal and informal sectors (excluding capital gains and gifts), consumption of own production,²³ imputed rent for owner-occupied housing, private transfers (remittances and other private transfers such as alimony), and retirement pension benefits from the contributory social insurance system.²⁴ *Postfiscal income* is defined as market income minus direct personal income taxes on all income sources (included in market income) that are subject to taxation and all contributions to social security (except for the portion going toward pensions), plus direct government transfers (mainly cash transfers but can include food transfers and free textbooks and school uniforms) and indirect subsidies, minus indirect taxes (for example, value-added tax, sales tax, and the like). *Final income* is defined as postfiscal income plus government transfers in the form of free or subsidized services in education and health valued at average cost of provision minus copayments or user fees, when they exist.²⁵

¹⁹ This section is based on Lustig and Higgins 2013.

²⁰ The surveys used in the country studies are the following: Armenia: Integrated Living Conditions Survey, 2011 (I); Bolivia: Encuesta de Hogares, 2009 (I); Brazil: Pesquisa de Orçamentos Familiares, 2009 (I); Chile: Encuesta de Caracterización Social (CASEN), 2009 (I); Colombia: Encuesta de Calidad de Vida, 2010 (I); El Salvador: Encuesta De Hogares De Propósitos Múltiples, 2011 (I); Ethiopia: Ethiopia Household Consumption Expenditure Survey and Ethiopia Welfare Monitoring survey, 2011 (C); Guatemala: Encuesta Nacional de Ingresos y Gastos Familiares, 2010 (I); Indonesia: Survei Sosial-Ekonomi Nasional, 2012 (C); Mexico: Encuesta Nacional de Ingreso y Gasto de los Hogares, 2010 (I); Peru: Encuesta Nacional de Hogares, 2009 (I); South Africa: Income and Expenditure Survey and National Income Dynamics Study, 2010–2011 (I); Uruguay: Encuesta Continua de Hogares, 2009 (I). The letters “I” and “C” indicate that the study used income or consumption data, respectively. For more details, see the country studies cited in the introduction. The references to each study are provided in note 4.

²¹ The surveys for Ethiopia and Indonesia do not have income data, so the incidence analysis is based on the assumption that consumption equals disposable income.

²² Market income is sometimes called primary or original income.

²³ Except for Bolivia and South Africa, whose data on auto-consumption (also called own-production or self-consumption) were not considered reliable.

²⁴ One area in which there is no agreement is how pensions from a pay-as-you-go contributory system should be treated. Arguments exist in favor of either treating contributory pensions as part of market income because they are deferred income or as a government transfer, especially in systems with a large subsidized component. Since this is an unresolved issue, the country studies were done for a benchmark case in which contributory pensions are part of market income and a sensitivity analysis in which pensions are classified under government transfers. These are available upon request.

²⁵ To avoid exaggerating the effect of government services on inequality, the totals for education and health spending in the studies reported here were scaled down so that their proportion to disposable income in the national accounts is the same as that observed using data from the household surveys.

Once these income concepts are generated, households are ranked by per capita market income. Next, inequality and poverty indicators are calculated for the three income concepts. Given that the valuation of government services at cost of provision is not equivalent to “cash,” poverty levels are not calculated for final income. If not free, it is unlikely that the poor would be willing to pay for these services at their cost. With the inequality indicators in hand, the contribution of government spending on education and health to the fiscal-policy-induced change in inequality can be calculated. Having allocated the education and health benefits to individuals, indicators of fiscal progressivity, such as cumulative shares, concentration coefficients, and Kakwani indices for spending on education (total and by level) and health (total and, when possible, by contributory and noncontributory systems, for example) can be calculated. The method applied here to value the benefit to an individual of going to a public school or receiving health care in a public facility is equivalent to using a simple binary indicator of whether the individual uses the government service.²⁶

An important limitation in monetizing benefits at the average cost of provision is that all who use a service or participate in a program implicitly receive the same benefits, which is obviously not correct. This approach is likely to introduce “a systematic bias in the results. Viewed from the supply side, the poor probably attend lower-quality schools and receive lower-quality healthcare” (Sahn and Younger 2000, 331). In fact, the quality of education and health care may be lower even when governments spend more in per capita terms, such as in poor remote areas that are more costly to reach.

The fiscal incidence analysis used here is point in time and does not incorporate behavioral or general equilibrium effects. That is, no claim is made that the original or market income equals the true counterfactual income in the absence of taxes and transfers. It is a first-order approximation. However, the analysis is not a mechanically applied accounting exercise. The incidence of taxes is the economic rather than statutory incidence. It is assumed that individual income taxes and contributions by both employees and employers, for instance, are borne by labor in the formal sector, and consumption taxes are fully shifted forward to consumers. For consumption taxes, the analyses take into account the lower incidence associated with own-consumption, rural markets, and informality.

REDISTRIBUTIVE EFFECT AND THE MARGINAL CONTRIBUTION OF EDUCATION AND HEALTH SPENDING

To measure the impact of fiscal interventions on inequality—that is, the redistributive effect—this analysis compares the Gini coefficient for final income with the Gini for market income. Figure 16.4 shows that the reduction in inequality ranges from 17.5 Gini points in South Africa to 2.3 Gini points in Ethiopia, and that its absolute value rises with GNI per capita.²⁷

According to Lindert (2004, 15),

History reveals a “Robin Hood paradox,” in which redistribution from rich to poor is least present when and where it seems most needed. Poverty policy within any one polity or jurisdiction is supposed to aid the poor more, . . . the greater the income inequality. Yet over time and space, the pattern is usually the opposite.

While there are exceptions to this general tendency, the underlying tendency itself is unmistakable, both across the globe and across the past three centuries.

²⁶This is, of course, only true within a level of education. A concentration coefficient for total nontertiary education, for example, calculated as the sum of the different spending amounts by level is not equivalent to the binary indicator method.

²⁷It should be noted, however, that for Ethiopia and Indonesia—due to the characteristics of the household surveys—the Gini coefficient is measured using consumption per capita while income per capita is used for the rest. A well-known fact is that consumption is less unequally distributed than income.

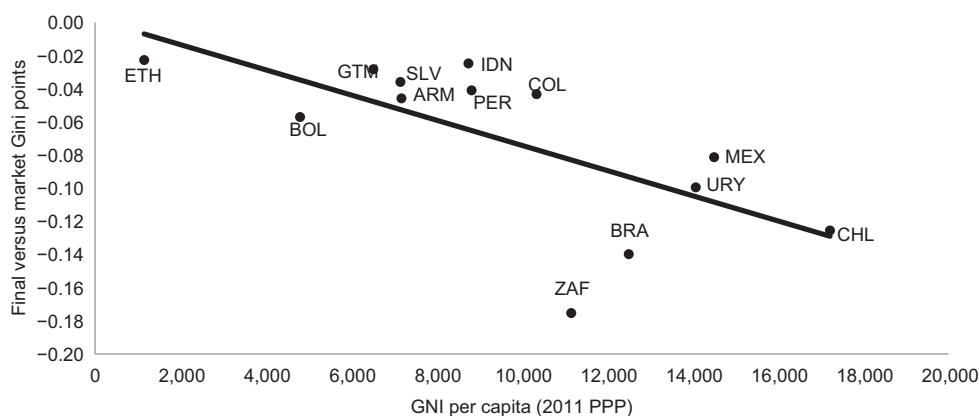


Figure 16.4 Redistributive Effect and GNI Per Capita, circa 2010

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehaye, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: GNI = gross national income; PPP = purchasing power parity. The Gini coefficients correspond to the year of the household survey: Armenia, 2011; Bolivia, 2009; Brazil, 2009; Chile, 2009; Colombia, 2010; El Salvador, 2011; Ethiopia, 2011; Guatemala, 2010; Indonesia, 2012; Mexico, 2010; Peru, 2009; South Africa, 2010–11; Uruguay, 2009. The Gini coefficients for Ethiopia and Indonesia are calculated using expenditure per capita; for the rest of the countries, they are calculated using income per capita. The data labels in the figure use International Organization for Standardization (ISO) abbreviations.

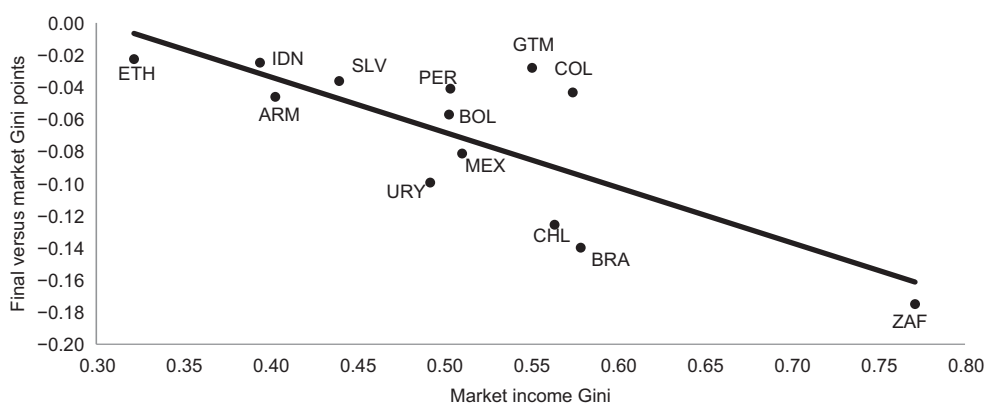


Figure 16.5 Redistribution and Market-Income Gini, circa 2010

Source: Author's calculations based on Younger and Khachatryan (2014); Paz Arauco and others (2014); Higgins and Pereira (2014); Ruiz-Tagle and Contreras (2014); Melendez (2014); Beneke, Lustig, and Oliva (2014); Hill, Tsehaye, and Woldehanna (2014); Cabrera, Lustig, and Morán (2014); Afkar, Jellema, and Wai-Poi (forthcoming); Scott (2014); Jaramillo (2014); Inchauste and others (2014); and Bucheli and others (2014).

Note: The Gini coefficients for Ethiopia and Indonesia are calculated using expenditure per capita; for the rest of the countries, they are calculated using income per capita. The data labels in the figure use International Organization for Standardization (ISO) abbreviations.

As discussed in Lustig (forthcoming), and in contrast to Lindert's (2004) findings, no "Robin Hood" paradox is apparent in this group of 13 developing countries. On the contrary, redistribution from rich to poor is greater in countries where inequality before fiscal interventions is higher (Figure 16.5), a result that seems consistent with the prediction of the Meltzer and Richard 1981 median-voter hypothesis. The redistributive effect ranges from 17.5 Gini points in South

Africa—the country with the highest market-income inequality—to 2.3 Gini points in Ethiopia—the country with the lowest market-income inequality. This result is robust even if South Africa is removed (an outlier in size of redistribution measured in percentage points). The result is also robust if the redistributive effect is measured as a percentage change instead of Gini points. Preliminary estimates suggest that the result that more unequal countries tend to redistribute more does not occur because more unequal countries tend to be richer and therefore have higher capacity to raise revenues and afford higher levels of spending. Regressing the change in the Gini (in percentage points) on GNI per capita and the market-income Gini shows that the coefficient for market-income Gini is 0.257,²⁸ that is, it is positive and significant even if GNI per capita is controlled for.²⁹ The coefficient for GNI per capita is significant but small: 0.000004.³⁰ The regression-based results, however, are not robust to removing South Africa. The coefficient for the market-income Gini is still positive, but it is no longer significant (Lustig forthcoming).

What is the contribution of public spending on education and health to the decline in final income inequality? Several ways can be used to calculate the contribution of a particular fiscal intervention to the change in inequality (or poverty): the marginal contribution, the sequential contribution, and the total contribution. The marginal contribution of spending on education and health to the reduction in final income inequality is calculated by comparing the inequality indicators with this type of spending included and without it, that is, as the difference between the final income and the postfiscal Gini coefficients.³¹ This method is equivalent to asking the question, what if the government had not spent at all on education and health?³²

The results are shown in Table 16.1. The marginal contribution of public spending on education and health as a proportion of the total reduction in inequality (that is, final income versus market income) ranges from as low as 12 percent in Ethiopia to as high as 100 percent in Bolivia and Guatemala.³³ The simple average is 69 percent.

THE PROGRESSIVITY AND PRO-POORNESS OF GOVERNMENT SPENDING ON EDUCATION AND HEALTH

When analyzing the impact of fiscal interventions on living standards, it is useful to distinguish between the net benefits in cash and the benefits received in the form of free government services in education and health. The cash component is measured by postfiscal income, equal to market income plus direct cash transfers, minus direct taxes (mainly personal income taxes), minus indirect taxes (mainly consumption taxes), plus indirect subsidies. The level of postfiscal income will tell whether the government has enabled an individual to be able to purchase private goods and services above what his or her original market income would have allowed. In

²⁸ This regression should be viewed with caution—because the Gini coefficients are measured with error, and the error is likely to be smaller the richer the country, the coefficient may be biased.

²⁹ The coefficient is significant for $p < 0.05$.

³⁰ The coefficient is significant for $p < 0.10$.

³¹ Note that because of path dependency, adding up the marginal contributions of each intervention will not equal the total change in inequality. Clearly, adding up the sequential contributions will not equal the total change in inequality either. An approach that has been suggested to calculate the contribution of each intervention in a way that the contributions add up to the total change in inequality is to use the Shapley value. The studies analyzed here do not do that.

³² In this particular instance, the marginal and sequential contributions are equivalent. The *marginal contribution* should not be confused with the *marginal incidence*, the latter being the incidence of a small change in spending. The marginal contribution is *not* a derivative.

³³ When the marginal contribution of education and health spending equals 100 percent it means that the other fiscal interventions combined had no effect on inequality.

TABLE 16.1

Contribution of Spending on Education and Health to the Overall Redistributive Effect, circa 2010													
	Armenia (2011)	Bolivia (2009)	Brazil (2009)	Chile (2009)	Colombia (2010)	El Salvador (2011)	Ethiopia (2011)	Guatemala (2010)	Indonesia (2012)	Mexico (2010)	Peru (2009)	South Africa (2010)	Uruguay (2009)
Gini of Market Income	0.4030	0.5030	0.5788	0.5637	0.5742	0.4396	0.3217	0.5509	0.3942	0.5107	0.5039	0.7712	0.4920
Gini of Postfiscal	0.3744	0.5028	0.5455	0.5251	0.5673	0.4294	0.3019	0.5508	0.3911	0.4809	0.4892	0.6946	0.4590
Gini of Final Income	0.3569	0.4460	0.4390	0.4381	0.5309	0.4036	0.2991	0.5227	0.3694	0.4294	0.4630	0.5961	0.3926
Marginal Contribution of Spending on Education and Health													
Difference between Final and Postfiscal	-0.0175	-0.0568	-0.1065	-0.0869	-0.0364	-0.0258	-0.0028	-0.0281	-0.0217	-0.0515	-0.0262	-0.0985	-0.0663
As a Share of Difference between Final and Market (percent)	38	100	76	69	84	72	12	100	88	63	64	56	67

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehay, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: Year of survey in parentheses. The Gini coefficients for Ethiopia and Indonesia are calculated using expenditure per capita; for the rest of the countries, they are calculated using income per capita. For methodology, see Lustig and Higgins 2013 and text.

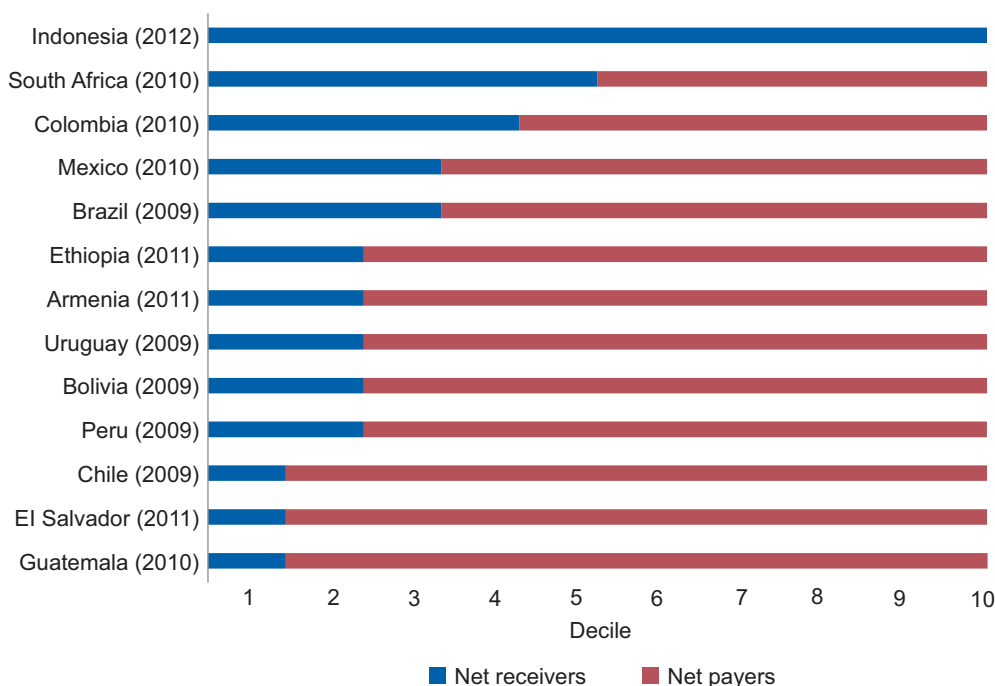


Figure 16.6 Net Payers to and Net Receivers from the Fiscal System by Decile, circa 2010

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehaye, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: Year of the survey in parentheses. The data for Ethiopia and Indonesia are calculated using expenditure per capita; for the rest of the countries, they are calculated using income per capita.

principle, it would be desirable for the poor—especially the extremely poor—to be net receivers of fiscal resources in cash so that poor individuals can buy and consume the minimum amounts of food and other essential goods imbedded in the selected poverty line.

Lustig (forthcoming) shows that in Chile, El Salvador, and Guatemala, on average, net receivers include individuals in the bottom decile only (Figure 16.6). In Armenia, Bolivia, Ethiopia, Peru, and Uruguay, only the bottom 20 percent is composed of net receivers in cash, on average.

Using the purchasing-power-parity (PPP) US\$2.50 per day international poverty line, the extreme poor are net payers, on average, in Armenia, El Salvador, Ethiopia, Guatemala, and Peru. In Ethiopia, the poor are net payers even when using the lower international poverty line of PPP US\$1.25 per day. Using the PPP US\$2.50 per day international poverty line, the incidence of postfiscal income poverty (after direct cash transfers, direct taxes, and net indirect taxes) is higher than market-income poverty in Armenia, Bolivia, Brazil, Colombia and Ethiopia (in Ethiopia, this result occurs with the \$1.25 poverty line as well). Governments must raise taxes to function, and those taxes may make the poor poorer even if the taxes and taxes net of cash transfers and subsidies are progressive (that is, equalizing). If the number of poor people made poorer by the fiscal system exceeds the number of poor people who escape poverty because of net transfers, the postfiscal income headcount ratio will be higher than the market-income one. However, even if poverty indicators show a reduction, it is still possible to find that a significant proportion of the postfiscal poor were impoverished by the fiscal system. Higgins and Lustig (2015), for example, find that for some poverty lines, roughly 40 percent of the postfiscal poor were

impoverished by fiscal policy in Brazil. Significant fiscal impoverishment occurred even though the fiscal system overall is found to be progressive (that is, equalizing) and poverty-reducing.

To what extent are the poor—especially in the countries in which they are net payers or in which postfiscal income poverty is higher (or both)—benefiting from government spending on education and health? This analysis measures the progressivity of public spending on education and health using concentration coefficients (also called quasi-Ginis).³⁴

In keeping with conventions, spending is defined to be regressive whenever the concentration coefficient is higher than the market-income Gini. When this occurs, the benefits from that spending as a share of market income *tend* to rise with market income.³⁵ Spending is progressive whenever the concentration coefficient is lower than the market-income Gini. This means that the benefits from that spending as a share of market income tend to fall with market income. Within progressive spending, spending is defined as neutral in absolute terms—spending per capita is the same across the income distribution—whenever the concentration coefficient is equal to zero. Spending is defined as pro-poor whenever the concentration coefficient is not only lower than the Gini but its value is also negative. Pro-poor spending implies that *per capita* government spending on the transfer *tends* to fall with market income.³⁶ Any time spending is pro-poor or neutral in absolute terms, by definition it is progressive. The converse, of course, is not true.³⁷

Use of the concentration coefficient to determine the progressivity of transfers, however, has one important drawback. A concentration coefficient may indicate that spending is progressive, for example, even if the concentration curve crosses the Lorenz curve for market income. To check whether there are crossings, concentration curves (or cumulative concentration shares) should be compared. For a benefit that is globally regressive, the concentration curve will lie everywhere *below* the market-income Lorenz curve. For globally progressive transfers, the concentration curve will lie everywhere *above* the market-income Lorenz curve. When the cumulative concentration curve coincides with the diagonal, spending per capita is the same across the income distribution, or neutral in absolute terms. In the case of pro-poor spending, the concentration curve lies everywhere *above* the diagonal.

The above classification is summarized in Figure 16.7. In the results presented below, there are no crossings (at the decile level) so broadly no ambiguity is introduced when relying just on the concentration coefficients. With regard to total spending on education and health, the conclusions are the same whether the analysis relies on the concentration shares (concentration curves) or the concentration coefficients.

A clarification is in order. In the analysis presented here, households are ranked by per capita market income, and no adjustments are made to household size because of differences in composition by age and gender. In some analyses, the pro-poorness of education spending, for example, is determined using children—not all members of the household—as the unit of analysis.

³⁴ A concentration coefficient is calculated analogously to the Gini coefficient. Let p be the cumulative proportion of the total population when individuals are ordered in increasing income values using market income, and let $C(p)$ be the concentration curve, that is, the cumulative proportion of total program benefits (of a particular program or aggregate category) received by the poorest p percent of the population. Then, the concentration coefficient of that program or category is defined as $2 \int_0^1 (p - C(p)) dp$.

³⁵ “Tend” because for global regressivity (progressivity) to occur it is not a necessary condition for the share of the benefit to rise (fall) at each and every income level. When the share rises (falls) at every income level, the benefit is regressive (progressive) *everywhere*. Whenever a benefit is *everywhere* regressive (progressive), it will be *globally* regressive (progressive), but the converse is not true.

³⁶ This case is also sometimes called progressive in absolute terms.

³⁷ Care must be taken not to infer that any spending that is progressive (regressive) will automatically be equalizing (unequalizing). Once one leaves the world of a single fiscal intervention, it is no longer possible to infer whether the impact of a specific intervention is inequality increasing or inequality reducing by just looking at the level and progressivity (or lack thereof) of the intervention in question (Lambert 2001, 277–78).

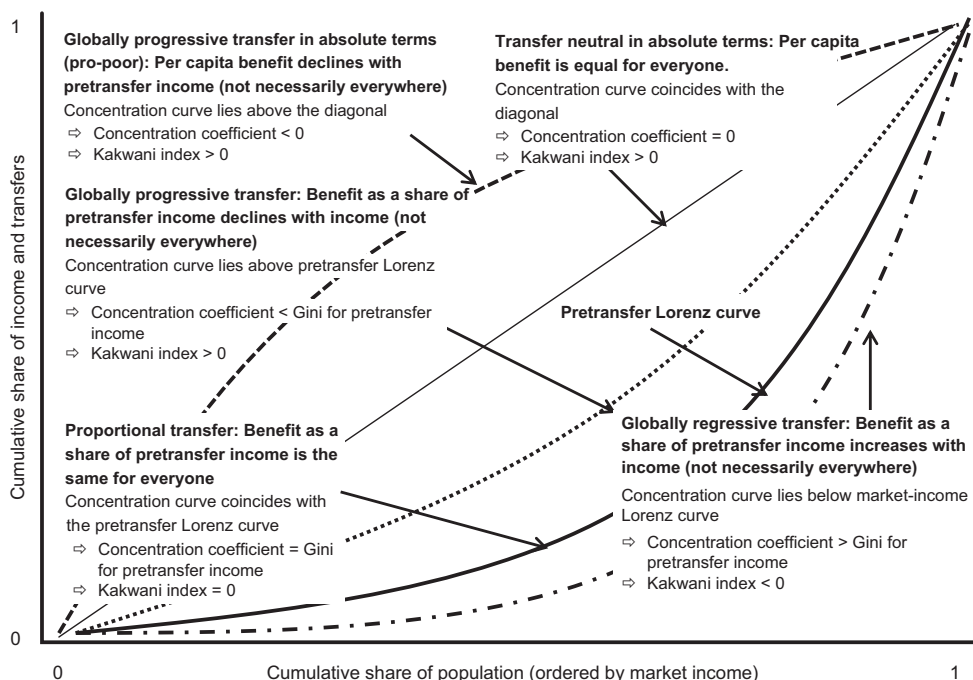


Figure 16.7 Progressivity of Transfers: A Diagrammatic Representation

Because poorer families have, on average, a larger number of children, the observation that concentration curves are pro-poor is a reflection of this fact. It does not mean that poorer families receive more resources per child.

Education

The cumulative concentration shares for education spending as a whole are shown in Table 16.2. As can be observed, education spending is pro-poor or neutral in absolute terms in all countries with the exception of Ethiopia where the richest 20 percent captures 35 percent of education spending.³⁸ Education spending is the most pro-poor (measured by the cumulative share accruing to the bottom 20 percent) in Brazil, Peru, and Uruguay.

Progressivity by education level is now examined. Table 16.3 shows the concentration coefficients for education disaggregated by level. Total education spending is pro-poor in all countries except Bolivia, Guatemala, and Indonesia, where it is approximately neutral in absolute terms, and Ethiopia, where it is very progressive but only in relative terms. Preschool tends to be pro-poor in all countries for which data are available (and preschool is provided), particularly so in South Africa. Primary school is pro-poor in all countries except for Ethiopia, where it is neutral in absolute terms. For secondary school, the pattern is quite heterogeneous. It is roughly neutral in absolute terms in El Salvador and Mexico; progressive only in relative terms in Ethiopia, Guatemala, Indonesia, and Uruguay; and pro-poor in the rest. Government spending on tertiary

³⁸ Given that Ethiopia is the poorest country and has a high rural population, this is not surprising. Education and health coverage in today's middle-income countries was low among the rural poor when the countries were poorer.

TABLE 16.2

Distribution of Market Income and Cumulative Concentration Shares of Education Spending by Decile, circa 2010 (*Percent*)

Decile	Armenia (2011)		Bolivia (2009)		Brazil (2009)		Chile (2009)		Colombia (2010)		El Salvador (2011)		Ethiopia (2011)	
	Market Income	Education	Market Income	Education	Market Income	Education	Market Income	Education	Market Income	Education	Market Income	Education	Market Income	Education
1	1.2	13.7	0.7	10.0	0.7	15.7	1.0	12.4	0.9	12.4	1.8	12.5	3.0	6.5
2	4.3	25.5	2.8	19.9	2.4	29.1	3.3	24.8	2.8	24.4	5.0	25.3	7.9	15.3
3	9.1	36.8	6.3	30.0	5.0	41.1	6.3	36.9	5.7	35.8	9.2	37.4	13.8	23.5
4	15.2	47.0	11.0	40.6	8.5	52.1	10.2	47.7	9.5	46.3	14.5	48.9	20.8	31.3
5	22.7	58.6	17.1	50.6	13.2	61.4	15.1	58.2	14.2	56.9	21.0	60.3	28.7	38.9
6	31.6	67.7	24.7	60.5	19.4	70.2	21.1	68.1	20.2	66.7	28.8	70.5	37.6	46.8
7	42.3	75.9	34.2	72.0	27.4	78.2	28.8	77.4	27.9	77.2	38.3	79.8	47.7	55.7
8	55.2	84.6	46.1	83.1	38.4	85.9	38.9	86.1	38.3	86.6	50.3	88.2	59.5	65.4
9	71.5	93.5	62.8	92.6	54.7	92.7	53.7	94.2	53.6	94.8	66.7	95.6	73.9	77.9
10	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Guatemala (2010)		Indonesia (2012)		Mexico (2010)		Peru (2009)		South Africa (2010)		Uruguay (2009)	
Market Income	Education	Market Income	Education	Market Income	Education	Market Income	Education	Market Income	Education	Market Income	Education
1.3	10.1	3.1	9.4	1.1	11.5	1.2	13.8	0.1	10.6	1.2	14.4
3.4	20.5	7.3	19.3	3.5	22.7	3.5	26.7	0.3	22.1	3.6	27.0
6.3	30.7	12.1	28.8	7.0	34.0	6.9	39.5	0.7	33.2	7.1	38.0
10.2	40.8	17.7	38.3	11.5	45.1	11.4	51.6	1.6	44.6	11.7	48.3
15.1	51.1	24.2	48.4	17.1	56.3	17.1	62.9	3.1	54.8	17.5	57.8
21.4	59.8	31.9	58.6	24.1	67.0	24.4	72.6	5.8	64.2	24.9	66.7
29.5	69.9	41.1	68.4	32.9	76.7	33.6	81.0	10.3	73.1	34.2	75.1
40.3	80.7	52.6	78.4	44.3	85.7	45.4	89.3	18.6	81.3	46.3	83.9
56.6	90.7	68.2	88.9	60.6	93.9	61.7	96.0	36.3	89.8	63.3	92.9
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehaye, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: Year of survey in parentheses. The data for Ethiopia and Indonesia are calculated using expenditure per capita; for the rest of the countries, they are calculated using income per capita. For methodology, see Lustig and Higgins 2013 and country studies sources.

TABLE 16.3

Concentration Coefficients and Budget for Education Spending by Level, circa 2010

	Armenia (2011)		Bolivia (2009)		Brazil (2009)		Chile (2009)		Colombia (2010)		El Salvador (2011)		Ethiopia (2011)	
	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)
Education	-0.1075	44.7	-0.0184	59.4	-0.1539	36.2	-0.1129	45.6	-0.1033		-0.1388	31.2	0.1831	48.7
Preschool	-0.0508	3.6	-0.2065	1.4	-0.3263	2.0	-0.2246	5.0	-0.2708		-0.2028	2.7	n.a.	n.a.
Primary	-0.1765	10.2	-0.2544	24.5	-0.3113	16.1	-0.1896	22.3	-0.3125	61.5	-0.2208	22.1	-0.0280	21.5
Secondary School	-0.1383	17.4	-0.1153	6.0	-0.2121	2.6	-0.1395	11.9	-0.1704	47.9	0.0189	3.9	0.2774	12.7
Lower Secondary	-0.1806	12.1												
Upper Secondary	-0.0412	5.3												
Tertiary	0.2461	2.2	0.2974	26.2	0.4367	5.6	0.2924	6.4	0.2854	13.5	0.4369	2.4	0.4098	14.6
Market-Income Gini	0.4030		0.5030		0.5788		0.56		0.5742		0.4396		0.3217	
	Guatemala (2010)		Indonesia (2012)		Mexico (2010)		Peru (2009)		South Africa (2010)		Uruguay (2009)			
	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)		
	-0.0099	45.1	0.0234	68.3	-0.0866	52.2	-0.1689	44.1	-0.1102	48.6	-0.1103	34.8		
	-0.1004	5.0	n.a.	n.a.	-0.2426	6.0	-0.2486	3.8	-0.4467	17.2	-0.4296	13.7		
	-0.1806	24.0	-0.0772	22.2	-0.2499	18.1	-0.3445	16.8	-0.4305					
	0.0256	10.2	0.0028	36.4	0.0850	18.7	-0.2009	14.7	-0.1200	13.0	-0.1223	8.9		
	-0.0148	7.6	-0.0306	27.5	-0.1625	10.9					-0.2623	5.4		
	0.1505	2.5	0.1064	8.9	0.0232	7.8					0.0966	3.5		
	0.5866	6.0	0.4788	9.8	0.3193	9.5	0.2542	8.8	0.4698	11.1	0.3130	7.6		
	0.5509		0.3942		0.5107		0.5039		0.7712		0.4920			

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehaye, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: Year of survey in parentheses. CC = concentration coefficient; n.a. = not available. Budget as a share of social spending. The concentration coefficients for total spending on education for Chile were calculated as the weighted average of spending by level with their respective budget shares as weights. The Gini coefficient for Ethiopia and Indonesia are calculated using expenditure per capita; for the rest of the countries, they are calculated using income per capita. For methodology, see Lustig and Higgins 2013 and country studies.

education is regressive in Ethiopia, Guatemala, and Indonesia; distribution neutral in El Salvador and Uruguay (roughly); and progressive to various degrees in the rest, but never pro-poor. Compared with their respective levels of market-income inequality, spending on tertiary education is most progressive in South Africa, followed by Colombia and Chile.

What narratives can be extrapolated from the distributional patterns of education spending just described? As a low-income country with a large rural population (more than 80 percent of the total), it is not surprising that education spending in Ethiopia is not “pro-poor.” Of the 13 countries, Ethiopia is likely to have the biggest challenges in coverage of education at all levels, including the most basic ones. The Ethiopian government spends a higher share of social spending on tertiary education than do other countries. Public spending on tertiary education, in general, is aimed more toward growth than toward redistributive purposes. A critical mass of tertiary-educated citizens can also be important for strengthening local democratic institutions and for the ability to deliver public services in education and health to the population at large.

In the large middle-income countries of Brazil and South Africa and also in Uruguay, a pattern emerges. Spending on preschool and primary education is highly pro-poor (large negative concentration coefficients) whereas spending on tertiary education tends to be more “pro-rich.” One possible explanation is that the middle classes and the rich opt out of public schooling at lower levels because of their poor quality and benefit later from the free high-quality tertiary education that the publicly educated children cannot access because they lack the preparation and skills.

Health

Table 16.4 shows the cumulative concentration shares for government health spending. It shows that health spending benefits the poorest 20 percent in Chile, Colombia, and Uruguay more, while it benefits the richest 20 percent in El Salvador, Ethiopia, Guatemala, Indonesia, and Peru relatively more. Using the concentration coefficients, health spending is pro-poor in Brazil, Chile, Colombia, South Africa, and Uruguay; roughly neutral in absolute terms in Armenia, Bolivia, and Mexico; and progressive in only relative terms in the rest (Table 16.5). Compared with their market-income inequality, the lowest progressivity is found in El Salvador, Ethiopia, Indonesia, and Peru (see the Kakwani coefficients). For Ethiopia once again, the pattern may be due to the large share of rural population, which makes providing access to health services more challenging.

Table 16.6 summarizes the results regarding the pro-poorness of government spending on education (total and by level) and health. Spending on education is more pro-poor in Armenia, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay because a larger share of the education budget is allocated to education levels (especially primary and, in middle-income countries, secondary) that are progressive in absolute terms: that is, pro-poor. For Ethiopia, the results should not be read as a lack of commitment on the part of the government to equalizing opportunities and reducing poverty and social exclusion. With a Gini coefficient of about 0.3, Ethiopia is a very equal country to begin with. Because it is a low-income country, almost the entire population lives under the middle-income international poverty line of US\$4 a day and 80 percent of the population lives in rural areas (Hill, Tsehaye, and Woldehanna 2014). When today’s middle-income countries were poorer, as indicated above, their spending on education and health was much less progressive and often not pro-poor. In fact, as discussed, judged by the share of total income devoted to social spending, Ethiopia appears quite committed to social progress: its level of spending is much higher than today’s rich countries’ levels of spending were when their income per capita levels were as low as Ethiopia’s is today.

TABLE 16.4

Distribution of Market Income and Cumulative Concentration Shares of Health Spending by Decile, circa 2010 (<i>Percent</i>)														
Decile	Armenia (2011)		Bolivia (2009)		Brazil (2009)		Chile (2009)		Colombia (2010)		El Salvador (2011)		Ethiopia (2011)	
	Market Income	Health	Market Income	Health	Market Income	Health	Market Income	Health	Market Income	Health	Market Income	Health	Market Income	Health
1	1.2	8.2	0.7	9.6	0.7	10.5	1.0	23.9	0.9	15.7	1.8	7.2	3.0	8.9
2	4.3	19.8	2.8	19.8	2.4	21.8	3.3	43.7	2.8	30.9	5.0	15.0	7.9	17.8
3	9.1	30.5	6.3	33.6	5.0	33.4	6.3	59.7	5.7	44.4	9.2	23.3	13.8	26.4
4	15.2	39.4	11.0	43.6	8.5	45.6	10.2	73.7	9.5	57.0	14.5	32.3	20.8	35.8
5	22.7	48.5	17.1	53.8	13.2	57.4	15.1	86.3	14.2	68.0	21.0	41.7	28.7	44.5
6	31.6	58.3	24.7	64.6	19.4	69.0	21.1	95.0	20.2	78.3	28.8	51.3	37.6	54.7
7	42.3	70.8	34.2	74.3	27.4	80.8	28.8	100.0	27.9	86.4	38.3	61.9	47.7	64.3
8	55.2	79.8	46.1	82.9	38.4	90.3	38.9	102.2	38.3	92.5	50.3	73.3	59.5	74.4
9	71.5	90.5	62.8	91.5	54.7	97.2	53.7	102.1	53.6	97.1	66.7	86.0	73.9	85.6
10	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Guatemala (2010)		Indonesia (2012)		Mexico (2010)		Peru (2009)		South Africa (2010)		Uruguay (2009)			
	Market Income	Health	Market Income	Health	Market Income	Health	Market Income	Health	Market Income	Health	Market Income	Health		
	1.3	5.6	3.1	7.3	1.1	9.1	1.2	5.7	0.1	10.2	1.2	12.4		
	3.4	12.0	7.3	15.5	3.5	18.4	3.5	12.0	0.3	20.6	3.6	24.4		
	6.3	18.8	12.1	23.9	7.0	27.8	6.9	18.9	0.7	31.2	7.1	36.1		
	10.2	27.3	17.7	33.3	11.5	37.5	11.4	27.1	1.6	42.0	11.7	47.2		
	15.1	36.6	24.2	42.8	17.1	47.3	17.1	36.5	3.1	53.1	17.5	57.8		
	21.4	47.4	31.9	52.5	24.1	57.5	24.4	46.6	5.8	64.2	24.9	67.6		
	29.5	58.4	41.1	62.8	32.9	67.8	33.6	58.2	10.3	75.3	34.2	76.8		
	40.3	71.3	52.6	73.0	44.3	78.1	45.4	70.6	18.6	85.9	46.3	85.2		
	56.6	85.2	68.2	85.2	60.6	89.0	61.7	85.1	36.3	95.0	63.3	93.0		
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehaye, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: Year of survey in parentheses. Budget as a share of social spending as defined here. The data for Ethiopia and Indonesia are calculated using expenditure per capita; for the rest of the countries, they are calculated using income per capita. The concentration shares for Peru do not include spending on contributory health programs, while the concentration coefficient in Table 16.5 does. For methodology, see Lustig and Higgins 2013 and country studies sources.

TABLE 16.5

Concentration Coefficients and Budget for Health Spending by Level, circa 2010

	Armenia (2011)		Bolivia (2009)		Brazil (2009)		Chile (2009)		Colombia (2010)		El Salvador (2011)		Ethiopia (2011)	
	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)
Health	0.0075	21.3	−0.0447	25.9	−0.1188	35.5	−0.4800	40.1	−0.2433	28.4	0.1178	44.0	0.0773	20.4
Market-Income Gini	0.4030		0.5030		0.5788		0.56		0.5742		0.4396		0.3217	
Kakwani	0.3955		0.5477		0.6976		1.0437		0.8175		0.3218		0.2444	
	Guatemala (2010)		Indonesia (2012)		Mexico (2010)		Peru (2009)		South Africa (2010)		Uruguay (2009)			
	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)	CC/Gini	Budget Share (percent)		
	0.1775	41.2	0.1111	23.1	0.0356	35.1	0.1798	48.3	−0.1026	28.6	−0.1020	44.0		
	0.5509		0.3942		0.5107		0.5039		0.7712		0.4920			
	0.3733		0.2831		0.4751		0.3241		0.8738		0.5940			

Source: Author's calculations based on Armenia: Younger and Khachatryan (2014); Bolivia: Paz Arauco and others (2014); Brazil: Higgins and Pereira (2014); Chile: Ruiz-Tagle and Contreras (2014); Colombia: Melendez (2014); El Salvador: Beneke, Lustig, and Oliva (2014); Ethiopia: Hill, Tsehaye, and Woldehanna (2014); Guatemala: Cabrera, Lustig, and Morán (2014); Indonesia: Afkar, Jellema, and Wai-Poi (forthcoming); Mexico: Scott (2014); Peru: Jaramillo (2014); South Africa: Inchauste and others (2014); and Uruguay: Bucheli and others (2014).

Note: Year of survey in parentheses. CC = concentration coefficient. Budget as a share of social spending as defined here. The Gini coefficient for Ethiopia and Indonesia are calculated using expenditure per capita; for the rest of the countries, they are calculated using income per capita. For methodology, see Lustig and Higgins 2013 and country studies sources.

TABLE 16.6

Progressivity and Pro-poorness of Education and Health Spending: Summary of Results

	Education Total			Preschool			Primary			Secondary			Tertiary			Health			
	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Regressive CC positive AND higher than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini
Armenia (2011)	+				+		+			+					+			+	
Bolivia (2009)		+		+			+			+			+					+	
Brazil (2009)	+			+			+			+			+				+		
Chile (2009)	+			+			+			+			+				+		
Colombia (2010)	+			+			+			+			+				+		
El Salvador (2011)	+			+			+				+		+		+				+
Ethiopia (2011)			+	n.a.				+				+				+			+
Guatemala (2010)		+		+			+				+					+			+
Indonesia (2012)		+		n.a.			+				+					+			+
Mexico (2010)	+			+			+			+			+					+	
Peru (2009)	+			+			+			+			+						+
South Africa (2010)	+			+			+			+			+				+		
Uruguay (2009)	+			+			+			+			+		+		+		

Sources: Tables 16.3 and 16.5.

Note: Year of survey in parenthesis. CC = concentration coefficient; n.a. = not applicable. If the concentration coefficient is greater than or equal to -0.05 but not higher than 0.05, it was considered equal to 0.

*CC is almost equal to market-income Gini coefficient.

CONCLUSION

This chapter analyzes the level, redistributive impact, and pro-poorness of government spending on education and health in 13 developing countries that are part of the Commitment to Equity project: Armenia, Bolivia, Brazil, Chile, Colombia, El Salvador, Ethiopia, Guatemala, Indonesia, Mexico, Peru, South Africa, and Uruguay. In particular, it addresses the following four questions: Does government spending on education and health increase with per capita income and income inequality? Do more unequal societies redistribute more? What is the contribution of spending on education and health to the overall reduction in inequality? How pro-poor is spending on education and health?

Social spending as a share of GDP ranges from 17.6 percent in South Africa to 4.9 percent in Indonesia. Government spending on education ranges from 2.6 percent of GDP in Guatemala to 8.3 percent in Bolivia; and spending on health ranges from 0.9 percent of GDP in Indonesia to 5.2 percent in Brazil.³⁹ Spending levels are generally higher than what today's rich countries spent when they were as poor as some of the lowest spenders in this sample are today. Clearly, forces must have been at play that led the developing world to devote more resources to social spending. One key difference is universal suffrage. When today's rich countries were as poor as today's developing countries, women and other groups were not universally allowed to vote.

Social spending as a share of total income increases with GNI per capita. Health spending increases with GNI per capita but education spending does not, a result mainly driven by Bolivia. Spending on primary education is roughly the same at different GNI per capita levels. Spending on secondary education, however, rises with income per capita and spending on tertiary education declines, a result that requires further research. Social spending and spending on education and health increase with market-income (pretaxes and transfers) inequality.

Measuring the redistributive impact and pro-poorness of education and health spending requires attaching a value to the benefit to an individual of using free public education and health services. Here, education and health services are valued at average cost of provision. Individuals were allocated the average cost of provision based on usage of the service. A well-known limitation of such an approach is that it ignores the fact that consumers may attach a value to services that is quite different from what the services cost. Given the limitations of available data, however, the cost-of-provision method is the best for now. To calculate the redistributive effect and pro-poorness of education and health spending, household income per capita is calculated after the values for education and health transfers are added to income net of direct taxes, indirect taxes, direct transfers, and indirect subsidies. The new Gini coefficient was compared with the Gini for market income. To assess the pro-poorness of education and health spending, the analysis uses concentration coefficients and cumulative shares.

Education and health spending lowers inequality by a significant amount, and its marginal contribution to the overall decline in inequality is, on average, 69 percent. There is no "Robin Hood" paradox in the countries covered here. On the contrary, redistribution from rich to poor is more present in countries in which inequality before fiscal interventions is higher.

Total spending on education is pro-poor in all countries except Bolivia, Guatemala, and Indonesia, where it is approximately neutral in absolute terms, and Ethiopia, where it is progressive only in relative terms. Preschool tends to be pro-poor in all countries for which there are data, particularly so in South Africa. Primary school is pro-poor in all countries except Ethiopia in which it is neutral in absolute terms. For secondary school, the pattern is quite heterogeneous. It is roughly neutral in absolute terms in El Salvador and Mexico; progressive only in relative terms in Ethiopia, Guatemala, Indonesia, and Uruguay; and pro-poor in the rest. Government

³⁹ Data are for about 2010.

spending on tertiary education is regressive in Ethiopia, Guatemala, and Indonesia; distribution neutral in El Salvador and (almost so in) Uruguay; and progressive to various degrees in the rest. Compared with their respective levels of market-income inequality, spending on tertiary education is most progressive in South Africa, followed by Colombia and Chile. Health spending is pro-poor in Brazil, Chile, Colombia, South Africa, and Uruguay; roughly neutral in absolute terms in Armenia, Bolivia, and Mexico; and progressive in only relative terms in El Salvador, Ethiopia, Guatemala, Indonesia, and Peru. Compared with their market-income inequality, the lowest progressivity is found in Ethiopia, Indonesia, El Salvador, and Peru.

Although a comparison of the evolution of the progressivity of education and health spending over time is beyond the scope of this chapter, it is interesting to note that spending on education and health appears to have become more pro-poor. Based on the data reported by Tanzi (2008), the share of education and health spending accruing to the bottom 20 percent for most Latin American countries was lower around 2000 than around 2010.⁴⁰ Although the studies used by Tanzi are not strictly comparable with those reported here, this result seems to indicate that the pro-pooriness of government spending on education and health in Latin America has increased during the past decade. Another example of this trend can be found in South Africa. Comparing the results in this chapter with those by Sahn and Younger (2000),⁴¹ spending on secondary education and health became pro-poor whereas it was not before.⁴²

In spite of this progress, given that in Bolivia, El Salvador, Ethiopia, Guatemala, and Peru the poor are, on average, net payers to the fiscal system or postfiscal income poverty is higher than market-income poverty, the fact that spending on education, health, or both is not pro-poor is of great concern. Less-than-universal access to and inability to use free (or quasi-free) government services in education and health for the poor, especially the extremely poor, however, should be of concern even if spending is pro-poor by the measures conventionally used and even if the poor are net receivers from the fiscal system in cash terms (total taxes paid minus direct transfers and subsidies). Governments should emphasize universalizing access to free services for those who cannot afford private schools and private medical services. A subject for further research is an examination of access to and usage of government services in education and health by income group, and an assessment of to what extent coverage for the poor is not universal.

Guaranteeing access to and facilitating usage of public education and health services for the poor, however, is not enough. As long as the quality of schooling and health care provided by the government is low, distortive patterns (for example, mostly the middle classes and the rich benefiting from free tertiary education),⁴³ such as those observed in Brazil, South Africa, and Uruguay, will be a major obstacle to the equalization of opportunities. However, with the existing information, one cannot disentangle to what extent the progressivity or pro-pooriness of education and health spending is a result of differences in family composition (that is, the poor have more children and, therefore, poor households receive higher benefits in the form of basic education transfers) or frequency of illness (that is, the poor have worse health than the non-poor) from the “opting-out” of the middle classes and the rich. This is another topic for further research.

⁴⁰ Compare Tables 16.2 and 16.4 with Tables 4 and 5 in Tanzi 2008.

⁴¹ Compare results in Tables 16.3 and 16.5 with Table 1 in Sahn and Younger 2000 (335).

⁴² In Sahn and Younger 2000, the concentration curves crossed the 45-degree line. That is, the null hypothesis that per capita income was the same for all could not be rejected.

⁴³ Among the reasons for this outcome is the fact that children of poor households tend to drop out of high school more, and the rich children who receive enough quality (often private) education are better equipped to pass the entrance examination.

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