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Fiscal Policy and Equity Estimation of the Progressivity and Redistributive Capacity of Taxes and Social Public Expenditure in the Andean Countries

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FISCAL POLICY AND EQUITY

ESTIMATION OF THE PROGRESSIVITY AND REDISTRIBUTIVE CAPACITY OF TAXES AND SOCIAL PUBLIC EXPENDITURE IN THE ANDEAN COUNTRIES[♦]

Alberto Barreix^{*}
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Luiz Villela^{*}

This study summarizes the assessment of the impact of fiscal policies on equity in the Andean countries. It evaluates the outcome of the main taxes and social public expenditures on income distribution applying a homogeneous methodology. The full effect of taxes is slightly regressive due to a weak personal income tax collection. The accumulated public social expenditure has a much higher redistributive impact. It improves the Gini coefficient by 5 percentage points, however, close to half the effect of developed economies (Organization for Economic Cooperation and Development - OECD). Considering taxes and social spending on a joint basis, the fiscal policy had a positive but insufficient redistributive effect.

I. INTRODUCTION

Studies conducted in the last ten years suggest that Latin America is the region with the highest inequality levels in the world, higher than those of developed, Asian, Eastern European and even of African countries. The Latin American country with the best income distribution (Uruguay) is more inequitable than the country with the worst income distribution in Eastern Europe (and the most inequitable among the developed countries as well), and not too different from the most unequal Asian country (De Ferranti, et al [2004]).

Within the Andean countries, with the exception of Colombia, where inequality indicators have remained stable, in all other countries in the region income distribution has deteriorated as compared to the early 1990s, with the peculiarity that such deterioration has been sharper in the

[♦] This work summarizes five country studies coordinated by the authors that were conducted by: Fernando Cossio (Bolivia), Juan Gonzalo Zapata and Natalia Ariza (Colombia), Gustavo Arteta (Ecuador), Jonathan Haughton (Peru), and Gustavo García and Silvia Salvato (Venezuela).

The United Kingdom's Department for International Development (DFID) financed these works through a non-reimbursable technical cooperation project of the Inter-American Development Bank (IDB), in addition to the publication of the book on Fiscal Equity in the Andean countries, which includes this summary chapter.

The DFID-IDB technical cooperation has had both the logistical and administrative support of the Andean Community's General Secretariat (SGCAN - *Secretaría General de la Comunidad Andina*), especially; Alexis Valencia, Siena Romero, Cecilia Matta and Juan Falconi have been of a great help. Also, we would like to thank the support and advice of Carlos Santiso (DFID), Peter Kalil, Carlos Molina and Fernando Velayos from the IDB, and the collaboration of Ernesto Mondelo and the IDB's Country Office in Peru, as well as the continuous assistance of Patricia Abad.

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countries that were, and still are, less inequitable: Venezuela and Peru, which has resulted in a smaller variance in the region's inequality ratios in a context of higher average inequality.

Within this framework, it becomes crucial to learn how the State, through its tax and expenditure policies, has modified welfare distribution in the region, and to draw policy lessons from that experience. To this end, the United Kingdom (UK) Department for International Development (DFID) - Andean Community (CAN) - Inter-American Development Bank (IDB) technical cooperation has commissioned the preparation of five studies, one for each Andean country, with the intention to assess the joint impact of tax and public expenditure policies on household income and spending distribution. This paper is basically intended to summarize the results of these five studies by consultants Fernando Cossio (Bolivia), Juan Gonzalo Zapata and Natalia Ariza (Colombia), Gustavo Arteta (Ecuador), Jonathan Haughton (Peru), Gustavo García and Silvia Salvato (Venezuela).

This paper is organized as follows. Section II assesses the margin for maneuver of the Andean countries to carry out their public social expenditure and investment policies by measuring its fiscal disposable income (Villela, Roca and Barreix [2005]), and compares the distribution of income in Latin America with other regions in the world, analyzes its evolution and, especially, establishes the position of the Andean countries *vis-à-vis* other countries in the region. Section III summarizes the results in terms of progressivity and redistributive capacity of the taxes analyzed in the five studies. Section IV is structured accordingly in relation to the items of government expenditure considered. Finally, Section V shows the overall impact of the fiscal policy (taxes and public social expenditure), and Section VI presents the conclusions.

II. DISTRIBUTION OF INCOME AND HOUSEHOLD SPENDING PRIOR TO FISCAL POLICY

Through its tax and expenditure policy, the State modifies the distribution of welfare.¹ Assuming that the income (consumption) of families is a welfare indicator, the first step to measuring the redistributive impact of the fiscal policy consists in determining the distribution of income (consumption) prior to the introduction of the fiscal policy. Then, once the joint incidence of the tax and public social expenditure policies has been identified, by simply contrasting the *ex ante* (without fiscal policy) and *ex post* (with fiscal policy) situations, a conclusion can be drawn as to whether such policy is either regressive or progressive, and its redistributive impact can thus be estimated.²

The theoretical discussion as to which is the best welfare indicator between income and consumption is yet to be solved. The studies conducted on the Andean countries analyzed both scenarios; in other words, the redistributive implications of the fiscal policy will be presented taking into account both the *per capita* income and the *per capita* spending of households, except for the study on Venezuela in which, due to the unavailability of information, only income-related results are presented. Some of the theoretical grounds in support of either income or spending as the best welfare indicator are summarized in Annex II.

A. Inequality in Latin America

Studies conducted in the last ten years suggest that Latin America is the region with the highest inequality levels in the world; higher than those of developed, Asian, Eastern European and even of African countries (Deininger and Squire [1996]; Bourguignon and Morrison [2002]).

Income distribution inequality is often considered to be associated with the degree of development attained by the country in question and, hence, comparisons among countries must control for such factor. Londoño and Székely [2000] performed a regression analysis to estimate the difference between verified inequality and expected inequality based on the level of development for a given set of countries. The difference found for Latin America is positive, that is, in our view, the region suffers from "excess inequality", the Gini index of which is close to 13 percentage points (De Ferranti, et al [2004]).

In line with Perry, et al [2006], it is interesting to observe that the position of Latin American countries in the inequality ranking was approximately the same in the last decades, in spite of

¹ As far as social protection is concerned, governments have three instruments of direct impact: (a) government-financed social plans (public social expenditure); (b) tax expenditures, such as Value Added Tax (VAT) exemptions or personal income tax deductions or credits, and (c) regulations, such as minimum wages, price and rent controls, and different forms of subsidized credit. These regulations, which may be deemed offensive as they seek to protect the lowest-income (though with great negotiating power) sectors, help increase market failures. Other regulations, which we call defensive, protect consumers from private or public players who have strong market power; therefore, they help correct market failures through, for instance, price caps (Barreix, Roca and Villela [2005]). Although regulations constitute a fiscal policy component that has impact on income distribution and equity, they were not analyzed in the studies included.

² These studies have examined fiscal equity only in terms of income distribution, though this concept can be further subdivided according to region, ethnic group or age.

their differences in growth rates, social situation, and political context. This seems to suggest that inequality in Latin America is due to deeply rooted reasons well beyond economic cycles and policies.

De Ferranti, et al [2004] states that the best income distributions in Latin America are (1) more unequal than the distribution of income of any of the developed countries, (2) more unequal than the distribution of income of any transition economy, and (3) even more unequal than the distribution of income of several countries in Sub-Saharan Africa. However, we deem it convenient to make some specific observations:

1) Income distribution inequality prior to fiscal policy in developed countries, as measured by the Gini index, is not very different from that of the best income distributions in Latin America (for instance, the Gini index for Uruguay in the year 2000 was 0.4460). In spite of that, as will be discussed below, the fiscal policy in such countries reduces the Gini ratio by at least ten points.

2) In the case of transition economies (from socialism to capitalism) and African countries, consumption (rather than income) is often the indicator used to measure distribution inequality; hence, it should be borne in mind that, as it has been empirically proved, consumption distribution is less unequal than income distribution.

The following table compares the distribution of income (Gini index) in the Latin-American countries with the best income distribution -Uruguay, according to World Bank figures- with the distribution of income (Y) or consumption (C) in: (a) the former Soviet bloc countries, except for the Baltic states, (b) the rest of the European transition economies that have already accessed the European Union (EU) or are closer to joining the European Union (EU) than the previous group (this group includes the Baltic states: Estonia, Lithuania and Latvia); (c) a group of South Asian countries, and (d) some countries in Sub-Saharan Africa. Since there are different ways to calculate the Gini index,³ single source, that is, the World Bank's World Development Indicators (World Bank [2005]) has been used so that figures may be comparable, at least from this point of view.

Finally, according to De Ferranti, et al [2004], the difference between the income distribution pattern in Latin America and other regions (Africa, Asia, Eastern Europe, and developed countries) does not lie in high concentration of income in the middle class and a very low concentration in the poorest deciles, as it has been sometimes suggested. The problem is that the highest-income sectors have a very high income share. The poorest 80% of the population has a lower income share than that of the rest of the regions in the world. For the income distribution pattern in Latin America to resemble that of the other regions, 5% of the richest population income would have to be transferred to 80% of the poorest households.

³ At least three variables are at stake when calculating the Gini index to measure income distribution inequality: (1) the unit of analysis: individuals or households; (2) the criterion to order the units of analysis for percentile design purposes: total income, income *per capita*, or equivalized income, and (3) the variable: total income or *per capita* income (with or without rental value).

TABLE 1
INCOME DISTRIBUTION
(Consumption)

	Year	Y or C	Gini	GDP CP in PPP - US\$
Uruguay	2000	Y	44.6	8,832
Transition Countries Former USSR				
Armenia	1998	c	37.9	2,079
Azerbaijan	2001	c	36.5	2,877
Belarus	2000	c	30.4	4,802
Georgia	2001	c	36.9	2,151
Kazakhstan	2003	c	32.3	6,663
Kyrgyz Republic	2002	c	34.8	1,629
Moldova	2002	c	36.9	1,477
Russian Federation	2002	c	31.0	8,130
Tajikistan	2003	c	32.6	1,091
Turkmenistan	1998	c	40.8	2,458
Ukraine	1999	c	29.0	3,756
Uzbekistan	2000	c	26.8	1,516
Transition Countries EU				
Estonia	2000	y	37.2	9,779
Latvia	1998	y	33.6	6,775
Lithuania	2000	c	31.9	8,766
Albania	2002	c	28.2	4,268
Bulgaria	2001	y	31.9	6,483
Croatia	2001	c	29.0	10,130
Czech Republic	1996	y	25.4	13,675
Macedonia, FYR	1998	c	28.2	5,414
Hungary	2002	c	26.9	14,720
Poland	2002	c	34.1	11,220
Romania	2002	c	30.3	7,027
Slovak Republic	1996	y	25.8	9,294
South Asia				
Bangladesh	2000	c	31.8	1,495
India	1999-2000	c	32.5	2,416
Pakistan	1998-1999	c	33.0	1,818
Sri Lanka	1999-2000	c	33.2	3,625
Sub-Saharan Africa				
Burundi	1998	c	33.3	605
Cameroon	2001	c	44.6	2,004
Côte d'Ivoire	2002	c	44.6	1,543
Ethiopia	1999-2000	c	30.0	676
Ghana	1998-1999	c	40.8	1,842
Mauritania	2000	c	39.0	1,666
Uganda	1999	c	43.0	1,201

Source: World Bank [2005] Table 2.7 (http://devdata.worldbank.org/wdi2005/Table2_7.htm).

Inequality, Growth and Poverty

In modern economic theory, Kuznets's [1966] pioneering studies established an empirical relationship between growth and inequality suggesting that income distribution changes systematically during a country's development process. Based on an eighteen-country sample, he concluded that income growth initially tends to concentrate, but its distribution improves as *per capita* income continues growing, producing the well-known inverted U-curve. Yet, later analyses, particularly by Deininger and Squire [1996], concluded that development does not improve income distribution.

More recently, Bourguignon and Morrison [2002] conducted a thorough worldwide study, from 1820 to 1992, in which they found that inequality increased along with *per capita* income, particularly since the end of World War II (Figure 1). Throughout 172 years, personal income grew about eight times, but the mean income of the poorest 60% increased four times, whereas the mean income of the top decile grew ten times. It is important to highlight, however, that poverty was reduced significantly; in 1820, 84% of the population lived in extreme poverty, while in 1992 extreme poverty had been reduced to 24%.

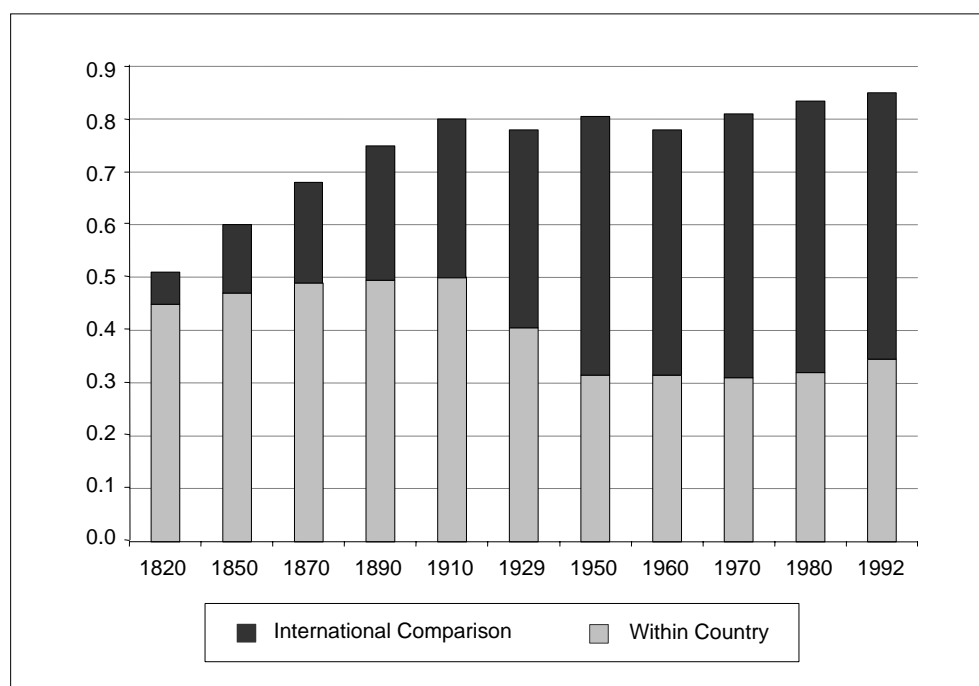
A breakdown of domestic and international inequality shows that precisely international inequality accounts for almost 60% of inequality. International integration gives rise to trade specialization, with its major implications upon technological progress, labor markets and structure of ownership, all of which affect income distribution (domestic inequality) and its evolution. In turn, domestic inequality has stabilized since 1950. Hence, we may infer that a considerable part of Latin-American inequality is associated with the role of the region in international trade. Since it is a *commodity*-producing region -significantly extraction of non-renewable natural resources- that has been de-industrialized, it has an income-concentration pattern, with the exception of nationalized businesses, whose problem lies in their lack of efficiency. In fact, the relative share of industry, which favors income distribution, in the region's Gross Domestic Product (GDP) has fallen by 11 points since 1970, while commodities account for more than 75% of extra-zone exports.

Moreover, growth -particularly manufacturing growth- can be said to encourage the reduction of absolute poverty. As a matter of fact, between 1980 and 1992, the decline in the world's poverty rates has involved 650 million people, due to the fast industrial growth of China and, to a lesser extent, of India, which together account for one third of the world's population, even when the population of both countries has increased by almost 350 million.

Inversely, when theoretically assessing the effect of inequality upon growth, Kaldor [1956] argued that the propensity to save is greater in firms than in individuals and, thus, income concentration fosters saving and investment and, consequently, output. Conversely, inequality holds back the pace of growth because borrowing restrictions on the poorest sectors reduce their chances of investment, as they have no access to collateral financing and suffer from problems of information asymmetry and institutional limitations.⁴

⁴ However, Barro [2000] stated that inequality seems to reduce the growth rate in poor countries and accelerate the growth rate in rich countries. Yet, he could find no econometric evidence that this results from borrowing restrictions.

FIGURE 1
THEIL'S INDEX OF WORLD'S DISTRIBUTION OF PERSONAL INCOME:
INEQUALITY WITHIN AND BETWEEN COUNTRIES
 (1820-1992)



Source: Bourguignon and Morrison [2002].

In a positive sense, Friedman [2005] claims that equality is growth-enhancing as it provides stability, education for women (which is crucial for birth control), and expansion of the market base, while fostering interpersonal trust and social capital. In addition, the same author makes reference to how significant the rural property reforms carried out in Asia in the second half of the 20th century were as a key factor for improving equality, a process that has not taken place in some Latin American countries. Alesina and Rodrik [1994] state that, from an empirical point of view, equality in land distribution has a much greater impact on economic growth than income distribution.⁵

Lastly, in theory, inequality fosters redistribution in democratic societies since average voters will tend to support redistribution options in order to come closer to the average income. Through tax revenue-financed transfers, the difference between the income of the average voter and the average income narrows, thus reducing the savings and investment capacity of the most affluent and of the general population. However, it has not been empirically proved that this process affects growth.

By way of a conclusion, international integration is a determinant of inequality on account of the relative position of a country and of its production structures that impact on domestic inequality.

⁵ It is important to remember the hypothesis posed by Acemoglu and Robinson [2006] whereby democratization processes bring with them the elites' commitment to policies that benefit the majority of the population, a factor that anticipates a change in the future distribution of the political power. Consequently, the distribution pattern changes as democracy strengthens.

Furthermore, (domestic) inequality is presumed to reduce growth, but evidence in this regard is weak; even less is known about the impact and process of this relationship (Helpman [2004]).

B. The Andean Community *vis-à-vis* the Rest of Latin America

Table 2 shows the Gini indexes of the distribution of equivalized income⁶ for Latin American countries in the early 1990s and first years of the 21st century (Table A.6. De Ferranti, et al [2004] p. 403). According to this table, inequality in three of the five countries in the region is above the average (Gini 51.4): Bolivia (55.9), Colombia (55.8), and Ecuador (54.3), while Peru (47.7) and Venezuela (45.5) are positioned below the mean inequality level.

On the one hand, Bolivia and Colombia, together with Brazil (Gini 57.2), Chile (56.1) and Guatemala (56.0), have the worst income distribution levels in Latin America. On the other hand, Venezuela and Peru, together with Uruguay (42.5) and Costa Rica (44.6), have the best income distribution levels in the region. Ecuador is in a mid-position.

If this table is analyzed from a temporal perspective, it appears that the standard deviation of the Gini coefficients fell significantly in the last decade, from 6.1 to 4.6 (De Ferranti, et al [2004]) This has led to a rise in homogeneity in Latin America *vis-à-vis* other regions.

This process of convergence of inequality levels has also been verified in the Andean countries. With the exception of Colombia, where the inequality rate has remained stable, in all the other countries in the region the distribution of income has deteriorated as compared to the early 1990s, with the peculiarity that this deterioration has been sharper in the countries that had, and still have, a less inequitable situation -Venezuela and Peru- which has resulted in a lower variance of inequality coefficients in the region in a context of greater mean inequality (49.4 in the early 1990s, 51.8 in the early 2000s).

⁶ The equivalized income seeks to capture both the needs of minors and the presence of economies of scale in households. It is calculated by dividing the household income by a $(A + \alpha_1 M_1 + \alpha_2 M_2)$ denominator, where A is the number of adults, M_1 represents the number of minors under the age of 5 and M_2 the number of minors between 6 and 14 years-old. The α_1 parameter captures the needs of children under the age of 5, and α_2 captures the needs of children between 6 and 14 years-old. In turn, θ expresses the impact of economies of scale. To prepare this table, De Ferranti, et al [2004], following Deaton and Zaidi [2002], chose the following values $\alpha_1 = 0.5$, $\alpha_2 = 0.75$ and $\theta = 0.9$.

TABLE 2
LATIN AMERICA AND THE CARIBBEAN: GINI COEFFICIENTS (X100) OF EQUIVALIZED
HOUSEHOLD INCOME

	Early 1990s	Mid 1990s	Early 2000s	Change
	(1)	(2)	(3)	(3) - (1)
Andean Community (non-weighted average)	49.4	50.8	51.8	1.8
Bolivia	54.3	55.8	55.9	1.6
Colombia	55.9	54.3	55.8	-0.1
Ecuador		53.0	54.3	n/a
Peru	45.7	46.4	47.7	2.0
Venezuela	41.7	44.5	45.5	3.8
MERCOSUR (non-weighted average)	47.6	50.7	51.3	2.4
Argentina	42.6	45.8	50.4	7.8
Brazil	59.5	58.3	57.2	-2.3
Paraguay		57.8	54.9	n/a
Uruguay	40.8	40.9	42.5	1.7
Chile	54.7	54.9	56.1	1.4
Mexico	53.9	52.5	52.7	-1.2
Central America (non-weighted average)	51.8	50.4	52.3	-0.2
Costa Rica	43.9	44.0	44.6	0.7
El Salvador	50.5	49.4	51.8	1.3
Guatemala			56.0	n/a
Honduras	55.6	54.1	53.0	-2.6
Nicaragua	54.2		54.1	-0.1
Panama	54.7	54.0	54.4	-0.3
Caribbean (non-weighted average)	48.4	50.9	48.6	-0.6
Jamaica	49.6	51.5	49.0	-0.6
Trinidad and Tobago	47.2			n/a
Dominican Republic		50.2	48.1	n/a
<i>Average (non-weighted)</i>	50.5	50.7	51.4	0.9
<i>Average (weighted by population)</i>	51.9	51.2	51.5	-0.4

Source: De Ferranti, et al [2004].

C. Income and Consumption Distribution According to Studies Conducted

The following table shows the initial distribution of *per capita* income and consumption in households, as obtained in the five studies. Initial distribution should be understood as the distribution prior to fiscal policy -that is before taxes and government expenditure- with the reservations already mentioned at the beginning of the paper. More specifically, the table presents the Gini index and the relationship between the income (consumption) of the wealthiest 20% and the poorest 40% of the population.

According to these data, if the Andean countries were ordered from the one with the worst income distribution to the one with the best distribution of income, based on the Gini index, the list would be as follows: Bolivia, Colombia, Peru, Venezuela, and Ecuador.

TABLE 3
INITIAL DISTRIBUTION OF HOUSEHOLD INCOME AND CONSUMPTION
(Before Fiscal Policy)

	Bolivia 2000	Colombia 2003	Ecuador 2003	Peru 2000	Venezuela 2003
Deciles by <i>per capita</i> Income					
Gini Income	0.556	0.537	0.407	0.535	0.423
% of Income of 20% +	0.63	0.60	0.47	0.57	0.57
% of Income of 40% -	0.06	0.10	0.15	0.10	0.12
20% + / 40% -	10.3	5.9	3.1	5.7	4.9
Deciles by <i>per capita</i> Spending					
Gini Spending	0.472	0.518	0.346	0.470	n/a
Spending % of Richest 20%	0.55	0.58	0.43	0.53	n/a
Spending % of Poorest 40%	0.11	0.10	0.20	0.14	n/a
20% + / 40% -	5.2	5.5	2.2	3.9	n/a

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Arteta [2005]; Haughton [2005]; García and Salvato [2005].

Since the methodological decisions adopted have a significant impact on the resulting Gini index, comparisons with other studies should be made with extreme caution. In addition, in our view, the most important analysis is to contrast data from similar surveys on the evolution in time of the same country instead of analyzing different countries. However, it should be pointed out that, save Ecuador, this ranking is the same as the one obtained by Perry, et al [2006]. Table 4 presents the distribution of *per capita*⁷ income in the Andean countries, according to the World Bank report (Gini index and the ratio between the average *per capita* income of the tenth decile -that is, the richest- and that of the first decile, that is the poorest).

In all cases, the World Bank processed microdata from household surveys for each country; because of this the Gini indexes obtained are naturally higher than the ones resulting from the studies based on aggregate data.⁸ The difference in years considered is also important though to a lesser extent because, as the greater or lesser inequality is a structural feature of any economy, it does not change significantly from one year to another. Two good examples of this are Chile, which has exhibited a solid performance in terms of growth but has been unable to correct significantly its income distribution inequality, and Uruguay, whose equity rates did not worsen in the last decade, despite the strong deterioration of its economic activity.

⁷ It should be borne in mind that the previous table made reference to equivalized income.

⁸ It is a well-established fact that the Gini index based on certain data is higher than the Gini index based on the same aggregate data.

TABLE 4
INCOME DISTRIBUTION IN THE ANDEAN COUNTRIES
ACCORDING TO THE WORLD BANK

	Year	Gini	Decile 10/Decile 1
Bolivia	1999	57.8	143.5
Colombia	1999	57.6	57.8
Ecuador	1998	56.2	63.6
Peru	2000	49.4	46.2
Venezuela	1998	47.6	28.2

Source: Perry, et al [2006].

Lastly, in line with our expectations, another result was that there was a better consumption rather than income distribution in all countries.⁹ The empirical literature on the income-consumption relationship has established that consumption, in both rich and poor countries, is not contingent upon short-term income fluctuations; therefore, its smoother and less variable evolution renders it the best proxy for permanent income. In other words, short-term observations of consumption -for instance, for one week- are much more indicative of annual consumption than what short-term observations of income show about annual income. In a dynamic approach, income fluctuations would cause more drastic changes to be introduced in any annual re-classification than the ones to be introduced if consumption were considered (Ruiz Castillo [2004]).

D. *Fiscal Disposable Income* of the Andean Countries¹⁰

Regardless of any analysis of the relevance as to the pros and cons of using the tax system and public social expenditure as income redistribution policy instruments, it is first necessary to assess the actual chances of the fiscal policy to fulfill its redistributive role in each Andean countries. This is the purpose of this section, which relies on the concept of *fiscal disposable income* to determine the margin for maneuverability available to governments to provide public services.

As defined by the United Nations System of National Accounts, the household disposable income is the sum of the incomes obtained by the household members minus taxes. In micro-economic terms, it is the household's budget constraint. Our interest in this definition focuses on its capacity to be used as *proxy* for the margin for maneuverability that households have in order to meet their needs, after deducting taxes, that is committed expenses. Certainly, the borrowing capacity of households increases their margin for maneuverability.

Likewise, in order to gain insight into the margin for maneuverability of governments, that is the percentage of revenue available to them, we have decided to define *fiscal disposable income* as tax revenue minus social security expenditure and sovereign debt servicing, that is committed expenses. This will be, then, the government's primary budget constraint to allocate resources to

⁹ There are highly remarkable exceptions: in UK household surveys, income is distributed less unequally than consumption.

¹⁰ The concept of *fiscal disposable income* is taken from Villela, Roca and Barreix [2005].

other categories of government expenditure (including investment). Again, just as with households, we are not considering the possibility that the State should engage in new deficit in order to enhance its spending capacity.

In addition, the adjective "disposable" should be taken in relative rather than absolute terms as there may be other disbursements committed under constitutional or legal provisions (for instance, tax exemptions, tenure system of public officials, etc.).¹¹ In brief, the *fiscal disposable income* is the residual flow available to the State once all social security and public debt service payments have been made, that is, prior to the payment of any government outlay, which may range from a judge or lawyer's salaries to an infrastructure investment.

Table 5 shows the *fiscal disposable income* as a percentage of the GDP for each Andean country in 2003, and compares the Andean bloc with the Organization for Economic Cooperation and Development - OECD (OECD [2004]), Chile, MERCOSUR (*Mercado Común del Sur*), and Central America. According to this information, the Andean countries' fiscal disposable income is only lower than that of the OECD member countries, and the margin for maneuverability of the region is greater than that of Central America, the MERCOSUR, and even Chile.

It should be mentioned, however, that total revenue includes the surpluses of state-owned enterprises, which are very significant in Venezuela (according to the Economic Commission for Latin America and the Caribbean (ECLAC), 18% of the GDP in 2003) and in Colombia (according to the International Monetary Fund (IMF), 4.6% of the GDP in 2003).

Within this context, a second (dynamic) form of approaching the concept of *fiscal disposable income* is to consider the possibility of increasing its figure by increasing tax revenue collection. In other words, is the country in condition to make a greater tax effort?

TABLE 5
ANDEAN COUNTRIES: FISCAL DISPOSABLE INCOME 2003
(in % of GDP)

	Total Revenue	Interest Public Debt	Pension Payments	Fiscal Disp. Income
Bolivia	18.2	2.9	4.5	10.8
Colombia	30.0	4.9	7.0	18.1
Ecuador	19.6	3.1	1.3	15.2
Peru	20.8	2.2	3.2	15.4
Venezuela	28.1	5.1	1.7	21.3
OECD	37.4	1.6	12.2	23.6
Chile	21.1	1.2	6.6	13.4
MERCOSUR	26.9	5.7	9.7	12.0
Central America	17.1	2.7	2.9	11.6

Source: OECD [2004]; ECLAC [2005a] and World Bank [2005].

¹¹ This paper is intended neither to pass judgement on the efficacy and quality of government expenditure nor to analyze intergenerational equity.

A country's tax capacity may be defined as the percentage of the GDP that the country should collect given the characteristics of its economy. These characteristics, which will determine its capacity for tax revenue collection, are, for example, its *per capita* income, export volume, mineral resources, and the industry and agriculture's share of the GDP.¹²

In turn, the tax effort of a country is defined as the relationship between its current tax revenue as a percentage of the GDP and its tax capacity. If this coefficient is below 1, this indicates that the government can effect changes in tax bases and/or rates and thus increase tax revenue collection without incurring excessive economic costs, since it is currently underusing its tax revenue potential as compared with other countries with similar characteristics. If, on the contrary, the tax effort coefficient is higher than 1, the tax system is collecting more than its tax revenue potential.

Estimations by Piancastelli [2001] and Teera [2001] indicate that in all countries in the region effective tax revenue collection is below the tax revenue potential, that is, their tax effort coefficient is below 1. For the 1985-1995 period, Piancastelli analyzed a 75-country sample and central government's revenue collection. He estimated the following tax effort coefficients: Bolivia 0.646, Colombia 0.771, Ecuador 0.882, Peru 0.878 and Venezuela 0.681. Teera studied a sample of 122 developed and developing countries during the 1975-1998 period. He estimated the following coefficients: Bolivia 0.624, Colombia 0.552, Ecuador 0.746, Peru 0.699 and Venezuela 0.897. In turn, Haughton [2005] estimated that the effective tax revenue collection in Peru is one third lower than its tax revenue potential.

Even though this analysis has no immediate implication, from a comparative taxation perspective, it suggests that in the Andean countries there is room for greater tax pressure, regardless of the sufficiency, efficiency, simplicity, and stability considerations (countercyclical fiscal policy) that are required. As to the focus of our analysis, such additional taxation could be designed to be progressive -personal income tax- or even regressive, as long as it enables the government to fund the pro-poor social expenditure that should more than offset the regressive effects of such taxation on income distribution. This issue will be discussed further throughout the document.

¹² Based on panel data, the following equation coefficients were calculated: $T/Y = a + b (Y/N) + c (X/Y) + d (R/Y) + e (A/Y)$ where: T: tax receipts; Y: GDP; N: population; X: exports; R: mineral and oil exports; A: agricultural GDP. In theory, coefficients b, c, and d are expected to be positive, and e, negative, given the difficulties involved in collecting taxes in the agricultural sector. Once these coefficients are estimated, a value for a country's tax capacity may be obtained by replacing in the above equation the value of the explanatory variables for such country.

III. PROGRESSIVITY AND REDISTRIBUTIVE CAPACITY OF THE TAX SYSTEM

This chapter examines the results obtained for these five Andean countries in relation to the progressivity and redistributive capacity of their main taxes.

A. Some Methodological Considerations

Incidence

Regardless of the statutory incidence of taxes, that is, who is responsible for paying them, the fundamental contribution of these analyses is the determination of the economic incidence of taxes, that is, who actually bears the tax burden. The methodology applied in each of the studies was based on traditional assumptions, namely:

1) Value Added Tax (VAT) is assumed to be borne by end consumers. Even within the framework of microsimulation models considering behavioral aspects, production prices are assumed to remain unaltered by tax reforms, while final consumer prices are assumed to be affected by them. Concerning the economic incidence of VAT, this assumes that the supply function has infinite elasticity and that the tax is passed on to the end consumer. This assumption was adopted in the different studies conducted.

It would be appropriate to consider that not only the VAT included in the sales of goods and services subject to taxation is passed on to the end consumer, but the VAT is included in the purchases of intermediate production supplies and investments made by the suppliers of exempted goods and services. Yet, this concept was not taken into account as data from input-output tables were not disaggregated enough.

2) It is assumed that the supply curves of the goods and services subject to excise taxes are horizontal (infinite elasticity), so that the producers of such goods and services may transfer taxes to prices.

3) The personal income tax is borne by the individual who receives such income.

Since there is no widespread consensus as to who effectively bears the burden of the corporate income tax and the foreign trade tax, neither of them have been considered in the Andean countries studies. A similar situation takes place with taxes on non-renewable natural resources. The Andean countries are very rich in oil, natural gas and minerals, which are exploited by state or privately-owned, mostly foreign, companies. Therefore, it is extremely cumbersome to assess the incidence (equity) of the fiscal policy (income tax, including royalties, and profits of state-owned enterprises). This would only be feasible if an analysis were made of the impact of the public expenditure financed by the government's fiscal policy.

As can be observed in the following table, which describes the Andean countries' tax structure, the tax burden is uneven, particularly in relation to income from non-renewable resources.¹³ VAT,

¹³ It should be borne in mind that income from non-renewable natural resources is highly variable and, on the other hand, social security contributions for pensions are also varied depending on the scheme applied in each country.

excise taxes, and corporate income tax account for nearly 50% of the tax burden. The table reflects the pre-eminence of VAT and the poor revenue collection derived from personal income tax.

TABLE 6
TAX STRUCTURE OF THE ANDEAN COMMUNITY COUNTRIES
(as % of the GDP)

	Bolivia 2000	Colombia 2003	Ecuador 2003	Peru 2000	Venezuela 2003
<i>Total Tax Revenue Collection</i>	19.8	23.8	19.6	14.3	28.3
<i>Tax Revenue - Soc. Sec. - SE</i>	18.1	15.6	15.7	12.2	9.8
<i>VAT</i>	5.6	6.3	6.4	4.9	4.7
<i>Sales Tax</i>	1.9	--	--	--	--
<i>Excise Taxes</i>	3.9	1.1	0.9	1.8	0.7
<i>Other Indirect Taxes</i>	--	0.4	0.0	--	--
<i>Income Tax</i>	2.3	5.0	2.7	2.7	1.9
Corporate	1.9	4.3	2.1	1.6	1.7
Personal	0.4	0.7	0.6	1.1	0.2
<i>Property Tax</i>	2.9	1.8	0.2	0.0	--
<i>Foreign Trade Tax</i>	1.3	1.0	1.5	1.6	0.8
<i>Other</i>	--		4.0	1.2	1.7
<i>Social Security Contributions</i>	1.7	3.6	3.3	1.7	0.5
<i>Surplus NFPS</i>		4.6	0.6	0.4	18.0

Note: SE: State-owned Enterprises; NFPS: Non Financial Public Sector.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Arteta [2005]; Haughton [2005] and García and Salvato [2005].

Progressivity Indicators and Redistributive Capacity

It is important to emphasize that the simulations performed in the five country studies have been static and have not included behaviour response, as described in Annex I. In addition, Annex II contains a brief discussion about the pros and cons of choosing income or expenditure as the best welfare indicator. It should also be noted that the household was the unit of analysis.

The studies conducted for each Andean country consider the progression of the average tax/income (or tax/consumption) ratio in the different deciles¹⁴ as a local indicator of how progressive taxes are. They also analyze the global progressivity of taxes through the Kakwani index, a global progressivity indicator. Lastly they assess the redistributive impact of taxes through the Reynolds-Smolensky index. The following is a brief description of these indicators.

¹⁴ Quintiles in the case of Bolivia.

The most common local progressivity indicator is the average rate progression. According to this indicator, any given tax will be progressive if, when expressed as a percentage of household income -that is average rate- it decreases as household income rises.¹⁵

Other local progressivity indicators are marginal rate progression, burden or elasticity progression, residual progression, and the share of total income tax paid by the income threshold. They are called local indicators because they measure the progressivity (or regressivity) when moving from one income distribution bracket to another, but they do not provide a global measure of the progressivity (or regressivity) of the tax under consideration.

The progressivity or regressivity of a certain tax may also be determined by comparing the Lorenz curve of household income prior to fiscal policy action with the concentration curve of the tax concerned. For each cumulative percentage of the population, the concentration curve measures the cumulative percentage that actually pays the tax in question.¹⁶ Pursuant to this graphic analysis, a given tax will be progressive relative to total distribution if and only if its concentration curve is always below the Lorenz curve of household income prior to the fiscal policy action (Lorenz dominance).

If there is no Lorenz dominance because curves cross over one another one or more times, any calculation representing inequality in a single digit -such as the Gini index- will still allow a complete ranking of income distributions, that is, any distribution pair may be sorted unambiguously (Lambert [1989]). The Gini index values range from 0 (maximum equality) to 1 (maximum inequality). As it is easy to interpret, it has become the most widely-used indicator. It should be made clear, however, that the Gini coefficient assigns (implicitly) more weight to the transfers made at the center than to those made at the extremes of distribution. Hence, other indexes have been developed that use different inequality-aversion parameters, the most popular being the Atkinson index and the entropy (Theil) index.

For the reasons stated above, the Kakwani progressivity index, based on the Gini coefficient, gives a clear indication of the progressivity or regressivity of a given tax. For instance, for VAT, the Kakwani indicator is defined as:

$$K = \text{quasi-Gini (VAT)} - \text{Gini (pre-fiscal policy income)}.$$
¹⁷

The *quasi-Gini ratio* of a tax is calculated in a similar way as the income Gini index, but on the tax concentration curve. This explains the semantic difference between them.

If $K > 0$, that is, if VAT is more equitably distributed than the pre-fiscal policy or pre-transfer income, the tax contributes to reducing income distribution inequality; hence, it is deemed progressive. If, on the contrary, $K < 0$, the tax is regressive.

¹⁵ In this section, income will be the only welfare indicator for simplification purposes. Yet, all indicators will have equivalent values if consumption is selected as a welfare indicator.

¹⁶ Whenever X percentages relative to Y distribution quintiles are represented, there is an X *versus* Y concentration curve. (Lambert [1989]).

¹⁷ If consumption is used as a welfare indicator, the index is defined as $K = \text{quasi-Gini (VAT)} - \text{Gini (pre-fiscal policy consumption)}$.

The Kakwani index enables us to estimate how progressive or regressive a given tax is, but as it does not change depending on its actual collection, it provides almost no hint of its redistributive capacity. A tax may be strongly progressive, but if it is insignificantly collected, its redistributive capacity will be equally insignificant. Therefore, this analysis has to be supplemented with the Reynolds-Smolensky index, a global indicator of the redistributive capacity of a tax.¹⁸ To continue with our example, in the case of VAT, this index is defined as

$$RS = Gini (pre-fiscal policy income) - Gini (income after VAT).^{19}$$

If $RS < 0$, its magnitude (in absolute terms) is indicative of how many Gini points income distribution inequality has increased as a result of the regressivity of the VAT introduced. The contrary holds if $RS > 0$.

Finally, the pre-VAT income distribution curve -on the basis of which the Gini ratio of pre-VAT income is calculated- should be thought of as the concentration curve of the share of the total tax revenue paid by each income group that would be obtained with a proportional tax yielding the same total revenue. In such case, the distance between this curve and the VAT concentration curve for a percentage p of the total population may be seen as the after-VAT income percentage that is shifted from the p percent of the richest (poorest) households to the $(1-p)$ percent of the poorest (richest) households due to the progressivity (regressivity) of the tax, (Lambert [1989]).

B. Value Added Tax (VAT)

As mentioned before, the progressivity of taxes will be analyzed considering (1) the progression of the average VAT/income ratio for household deciles ordered by *per capita* income and (2) the progression of the average VAT/consumption rate for household deciles ordered by *per capita* consumption. This distinction is particularly significant in the case of VAT because in the (a) scenario, the tax is highly likely to be progressive, and in the (2) scenario it is highly likely to be regressive. The different conclusions reached, depending on whether one or the other case is considered, are not surprising:

1) On one hand, the wealthiest households spend a significantly lower share of their income than the poorest households, who have no savings capacity and spend their entire income.²⁰ Therefore, even if there are well-designed tax exemptions and differential rates, VAT as a percentage of income is highly likely to be lower in the richest households than in the poorest households. Thus, the tax is regressive. Well-designed tax exemptions should be understood as exemptions granted on the goods

¹⁸ A local indicator of the redistributive capacity of a tax is its relative income share, which measures the changes in the relative income of a given group of the population as a result of such tax.

¹⁹ If consumption is used as a welfare indicator, the index is defined as $RS = Gini (pre-fiscal policy consumption) - Gini (consumption after VAT)$.

²⁰ Moreover, households in the poorest deciles usually report that their spending is higher than their income, even in developed countries. In Spain, for instance, this is the case in 60% of the households, according to surveys (Ruiz Castillo [2004]).

and services that weigh more heavily on the consumption basket of the poorest households.²¹ Should differential tax rates exist, as in Colombia, in order not to affect the general application principle, well-designed exemptions and differential tax rates should be those determining an effective tax rate that is less burdensome on the poorest households' consumption basket.

2) On the other hand, if there are tax exemptions on goods and/or services and differential tax rates - that is, higher and lower than the general tax rate- and such instruments determine a lower effective tax rate on the consumption basket of the poorest households, the VAT/consumption ratio will increase as one climbs up in the scale of households ordered according to their income *per capita*. Hence, the tax is progressive. At this stage, it is important to emphasize that in considering VAT burden as a percentage of household consumption, the ultimate analysis is whether tax exemptions and differential tax rates are well-designed or not (in the above-mentioned sense).

If we analyze Table 7, this last question can be answered for the Andean countries (save Venezuela, a country for which no data was available to sort households according to their *per capita* spending) (García and Salvato [2005]).

In the cases of Bolivia, Colombia and Ecuador, VAT is progressive (positive Kakwani index). Therefore, it may be concluded that in Bolivia and Ecuador -with flat VAT rates of 14.94%²² and 12%, respectively- tax exemptions are in general well-designed, that is, they are applied on the goods and services with the highest impact on the consumption basket of the poorest households. In the case of Colombia, exemptions and differential rates²³ are also thought to be well-designed, because they impose a lower effective tax rate on the consumption basket of the poorest households.

The case of Peru is worth noting, as its VAT is regressive. Peru applies a flat rate of 19% -the highest in the sub-region- for which reason it may be concluded that VAT exemptions are usually borne by the relatively richest households. Therefore, tax exemptions should be analyzed in detail in order to establish whether there is any need to review them or whether, on the contrary, the exemptions are granted on account of positive externalities or because deciding otherwise would entail high administration and/or compliance costs. It is important to emphasize that the VAT productivity -defined as the ratio between tax revenue to GDP and the tax rate- reflects a very poor performance in the sub-region (around 35%), with the exception of Ecuador, where it stands at 50%. This is indicative of design or administration deficiencies.

²¹ We are not discussing now whether certain exemptions, though regressive, are equally relevant for other reasons (positive externalities, tax administration difficulties, etc.).

²² The flat nominal rate of 13% applied to VAT in Bolivia is equivalent to an actual tax rate of 14.94%, as the tax is not transferred to prices ("*impuesto por dentro*"); see Cossio [2005].

²³ In Colombia, the general VAT rate is 16%, but there are differential rates applied to six categories of goods and services: live animals (2%); other goods and services (7%); mobile telephone services (20%); liquor (35%); beer (11%); motor vehicles (16%, 20%, 21%, 33%, 35%, 38% and 45%).

TABLE 7
VALUE ADDED TAX (VAT)
(Deciles by Household Consumption)

1. Progressivity	Bolivia (1)	Colombia	Ecuador	Peru
Effective Income/Consumption Ratio (as a %)				
1st -	6.83	4.73	3.78	6.50
2nd -		4.57	4.11	6.90
2nd +		5.14	6.31	7.60
1st +	7.68	5.93	7.57	6.70
Gini Pre-Tax Expenditure	0.472	0.518	0.346	0.470
Quasi-Gini of VAT	0.481	0.564	0.452	0.455
Kakwani (if < 0 => regressive; if > 0 => progressive)	0.009	0.046	0.106	-0.015
2. Redistribution				
Gini after VAT Expenditure	0.471	0.515	0.339	0.471
Transfer from the 50%- to the 50% + (or from 50% + to 50%-)	0.04%	0.15%	0.33%	-0.06%
Losers	5	10	9 and 10	4 to 9
<i>Memo: Revenue from VAT (as a % of GDP)</i>	5.6	6.3	6.4	4.9

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Arteta [2005] and Haughton [2005].

The results are different when (Table 8) households are ordered by their *per capita* income and when the income/effective VAT rate is considered.

TABLE 8
VALUE ADDED TAX (VAT)
(Deciles by Household Consumption)

1. Progressivity	Bolivia (1)	Colombia	Ecuador	Peru	Venezuela
Effective Tax/Income Ratio (as a %)					
1st -	6.98	10.80	4.59	29.70	6.43
2nd -		8.56	4.15	13.30	7.16
2nd +		5.39	4.89	5.80	8.77
1st +	8.00	4.71	5.15	4.30	9.47
Gini, before VAT Income	0.556	0.537	0.408	0.535	0.423
Quasi-Gini of VAT	0.547	0.469	0.445	0.358	0.473
Kakwani (if < 0 => regressive; if > 0 => progressive)	-0.009	-0.068	0.038	-0.177	0.050
2. Redistribution					
Gini, Income after VAT	0.557	0.541	0.406	0.547	0.427
Transfer from 50%- to 50%+ (or from 50%+ to 50%-)	-0.05%	-0.20%	0.09%	-0.60%	-0.22%
Losers	2 and 3	1 to 6 and 9	9 and 10	1 to 8	10
<i>Memo: VAT collection (as % of GDP)</i>	5.6	6.3	6.4	4.9	4.7

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Arteta [2005]; Haughton [2005]; García and Salvato [2005].

In line with the comment made at the beginning of this section, (1) in Peru, VAT is even more regressive (the Kakwani index is more negative), and (2) in Bolivia and Colombia, VAT turns out to be regressive.

The results for Ecuador and Venezuela are striking: even if households are ordered in deciles according to their per capita income and the effective VAT/income ratio is considered, the tax turns out to be progressive. In both cases, this can be partly explained by the relatively good distribution of income -in the case of Venezuela, in line with other international sources, though this is not the case in Ecuador-.

The progressivity or regressivity analysis of VAT must be supplemented with an analysis of the actual collection of the tax, in order to determine its redistributive role. In this respect, it is interesting to note that, regardless of whether the tax is progressive or regressive, the redistributive effect of the VAT -the major tax revenue source in all five Andean countries- is only modest as compared to the redistributive capacity of public social expenditure, as will be shown below. In the case of Peru, where the redistributive impact is greater, 0.6% of the total after-tax income is transferred from 50% of the poorest households to 50% of the richest households, simply because the tax is regressive. In all other cases, the redistributive impact is far less significant, and does not exceed +/- 0.2%.

The Other Perspective: In Absolute Terms, the Most Affluent Are the Ones Who Pay the Most

It is usually held that the general application of VAT -in the event that existing tax exemptions were well-designed, they would be applied to the goods and services with a greater incidence on the consumption basket of the poorest households- makes the tax even more regressive. However, this argument is only partially correct, as it fails to consider the revenue source and the use of the tax.

As to the tax revenue source, the richest sectors spend significantly more than the poorest ones, in absolute terms; therefore, the former are the ones who bear the greatest percentage of the VAT collected. As it can be seen in Table 9, in the Andean countries, the VAT paid by the richest 20% of the population is between 2 times (Peru) and 9 times (Bolivia) higher than that paid by the poorest 20% (considering the classification of households according to their *per capita* income).

TABLE 9
VAT: WHO PAYS THE TAX?

	Bolivia	Colombia	Ecuador	Peru	Venezuela
40% -	7%	14%	14%	19%	10%
20% +	62%	55%	52%	44%	60%
20% + / 40% -	8.9	4.0	3.7	2.3	6.2

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Arteta [2005]; Haughton [2005]; García and Salvato [2005].

This finding has given rise to some consensus as to the fact that it is not a sensible fiscal policy measure to give up on this revenue from the highest-income sectors, but rather to eliminate tax

exemptions and target public expenditure on the lowest-income sectors. Taking into account, as already stated, that the greatest portion of VAT is collected from the highest-income sectors, if this additional tax revenue were allocated to the poorest sectors through targeted public expenditure, the "fiscal" result of applying VAT on a general basis would turn out to be progressive, even if the "tax" itself is regressive.²⁴

If it were possible to prove that (1) the elimination of certain VAT exemptions does not substantially alter regressivity and (2) public expenditure has a better redistributive capacity than fiscal policy, the idea would certainly gain substance. The first point -how income distribution varies if VAT exemptions are eliminated- should be examined as soon as possible by the Andean countries, in view of the approval of Directive 599, under which VAT is to be standardized in those countries, keeping only four exemptions: health services, education services, land passenger transport -in view of the positive externality due to the presence of the Andes range- and financial brokerage services. The results related to the second issue are analyzed in the following section of this paper.²⁵

Just Like Cholesterol, Evasion can be: Good or Bad

Cossio [2005] performs an interesting exercise for Bolivia. For each one of the goods and services consumed by households, he determines a "tax coefficient" that, when multiplied by the nominal VAT rate, reflects the effective rate applied on such goods and services, depending on the type of outlet where they are purchased, based on household survey data. For instance, if clothes and shoes are bought at a supermarket (formal economy), the full VAT rate is applied (the tax coefficient equals 1), but if they are purchased at a street market (informal economy), domestic transportation, wholesale and retail distribution taxes are not liable to taxation; then, the tax coefficient is lower, as a result of tax evasion (0.75% according to this analysis).²⁶ Likewise, for durable goods, the "tax coefficients" estimated by the author are expected to capture the effect of smuggling.

Although this is in no way the author's intention, this analysis might be used in support of those who claim that there are two types of tax evasion, a "good" and a "bad" one, just like cholesterol.

²⁴ Recent studies conducted for the Colombian tax reform showed that VAT exemptions represented a tax expenditure accounting for 2.5% of the GDP and that 30% of this cost benefited the richest 10%. Since the wealthier spend more on food and health than the poor -though in lesser proportion to their income- if the tax collected is efficiently allocated to the lowest-income sectors, the elimination of tax exemptions is an improvement in the distribution of the disposable income, even considering certain losses resulting from the inefficiencies incurred by the public sector in the administration of such transfers. In Mexico, where VAT collection accounted for 3.8% of the GDP in 2004 -one of the lowest in the world- 44% of the potential tax base is exempted or taxed at zero rate, with a total tax expenditure in excess of 2% of the GDP. As to the zero rate, which subsidizes goods and services in the family basket and represents a tax expenditure accounting for 1.5% of the GDP, more than 55% of the benefit favors the richest 20% and the following most affluent 20% receives another 22% of the tax waiver.

²⁵ This policy is clearly reliant on the direct impact of exemptions on consumption, poverty and extreme poverty levels, efficacy in the provision of the financed government expenditure and the public sector's targeting capacity.

²⁶ For a full detail of methodological considerations and the tax coefficient matrix, see Cossio [2005], page 31 and subsequent pages, and Annex C. Jenkins and Kuo [2004], using a similar methodology, considering consumption (proxy for permanent income) and adjusting an actual VAT rate -assuming that the latter behaves in a manner that is inversely proportional to the level of income of households at the final stages of consumption- find that VAT in the Dominican Republic (called *Impuesto de Transferencia, Bienes Industrializados y Servicios - ITBIS*) is progressive.

"Good" evasion would be the one affecting VAT, because the poorest spend their income mostly in the informal economy, for which reason they are subject to a lower effective tax rate, thus softening the (theoretical) regressivity of the tax. "Bad" evasion would be the one affecting personal income tax, because capital income, due to its volatile nature, can most easily avoid taxation, and capital income is basically earned by the highest-income sectors.

Although it is not our purpose here to argue that all forms of evasion are "bad", the "goodness" of VAT evasion in terms of its impact on income distribution should be underestimated. According to Cossio's estimations, the Gini coefficient of after-VAT consumption distribution, "without evasion" is 0.471, while the after-VAT Gini index "with evasion" is 0.470. In more concrete terms, the total consumption of the poorest 20% of the population shifts from 2.68% to 2.70% after VAT "without evasion", and to 2.71% after VAT "with evasion". In turn, the total consumption of the richest 20% of the population shifts from 54.17% to 54.08% after VAT "without evasion", and to 53.94% after VAT "with evasion". As we can see, differences are negligible enough to rebut the argument that evasion operates, *de facto*, as a redistributive mechanism.

C. Excise Taxes

There is widespread agreement over the fact that the goods on which excise taxes are traditionally levied (tobacco by-products, alcoholic beverages, fuels obtained from oil) have some features that very well justify their taxation (Barreix, Villela and Taccone [2003]). For instance, in tobacco by-products and alcoholic beverages, the tax is intended to correct the negative externalities resulting from the harmful consequences on health caused by their consumption. Something similar occurs with the excise tax on fuels obtained from oil, which may generate externalities resulting from pollution, and may be deemed as a substitute for road use charges, in the absence of tolls.

The advantage of these taxes is that they are levied on goods typically having low price elasticity, due to the degree of addiction associated with their consumption or the lack of substitutes; for this reason, they are major tax revenue sources (on average, almost 1.5% of the GDP in the Andean countries).

Finally, these taxes are easily administered, as the number of producers is usually reduced and the taxable event may be defined ex-factory. Yet, the main difficulty with excise taxes is smuggling, particularly in goods such as cigarettes and soft drinks, where cross elasticity between the original and non-original products is very low and there are no major cultural differences in consumers' preferences.

Excise Taxes on Fuels: the Importance of the Input-Output Matrix

In only two countries -Peru and Bolivia- was there enough information available to analyze the progressivity and distributive impact of excise taxes on fuels. The results are markedly different:

in Peru, the tax is progressive, whereas in Bolivia it is regressive.²⁷ These different results can be accounted for because of the methodologies employed, as explained below.

As a matter of fact, in the case of Peru, the high quasi-Gini index of the tax (0.781, Kakwani = 0.246) points to a very high progressivity. However, as Haughton [2005] warns, this result should be approached with extreme caution as it is almost exclusively based on the assessment of the direct impact of the tax, which is generated by the consumption of fuel directly made by households for private use, and this represents only one sixth of the total fuel sales in Peru. As stated by the author, this overestimates the progressivity of this tax, which would be significantly reduced if the indirect fuel purchases made by households through their public transportation spending were taken into consideration.

TABLE 10
EXCISE TAXES ON FUELS
(Deciles by Household Income)

1. Progressivity	Bolivia (1)	Peru
Effective Tax/ Income Ratio (as a %)		
1st -	13.95	0.40
2nd -		0.32
2nd +		1.04
1st +	2.43	2.34
Gini, Pre-Tax Income	0.556	0.535
Quasi-Gini, Fuels	0.336	0.781
Kakwani (if < 0 => regressive; it > 0 => progressive)	-0.220	0.246
2. Redistribution		
Gini, After-Tax Income	0.565	0.532
Transfer from 50%+ to 50%- (or from 50%- to 50%+)	-0.45%	0.14%
Losers	1 to 4	10
3. Who Pays the Tax		
40% -	17%	3%
20% +	39%	82%
20% + / 40% -	2.3	27.4
<i>Memo: Revenue as % of GDP</i>	2.7	1.1

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005] and Haughton [2005].

²⁷ This holds when the actual tax/income rate is considered and deciles are constructed in accordance with *per capita* income of households (which are the results shown here), as well as when the actual tax/consumption rate is considered and deciles are constructed in accordance with *per capita* spending of households (such results being included in the respective studies).

This is precisely Cossio's [2005] exercise for Bolivia. To calculate the effective rate of the excise tax on hydrocarbons and their by-products (*Impuesto Especial a los Hidrocarburos y sus Derivados* - IEHD), the author takes into account and estimates -using the Input-Output Matrix- the share of fuels in different household spending items, such as: family car operating and maintenance expenses; public transportation; school transportation; kerosene, liquefied petroleum gas (LPG) and gas for cooking purposes; travel, and meals inside or outside the household. In this exercise, the tax is regressive, and quintiles 1 to 4,²⁸ accounting for 80% of the population, are the ones who lose the most with the application of this tax (their after-tax income share is lower than their pre-tax income share).

The redistributive capacity of the direct and indirect impact of this tax should not be underestimated. For instance, in Bolivia, the impact of the VAT -which is generally applied at a flat rate of 14.95% and has very few exemptions- is equivalent to 0.05% transfer of total after-tax income from 50% of the poorest households to 50% of the richest households due to the tax regressivity (when households are ordered by their *per capita* income). Meanwhile, the impact of excise taxes on fuels is equivalent to a 0.45% transfer of total after-tax income from 50% of the poorest households to 50% of the richest ones due to the regressivity of the tax (provided households are ordered by their *per capita* income).

If the direct distributive impact of excise taxes on fuels are assessed and found to be progressive and if the total impact (both direct and indirect) is analyzed and found to be regressive, the total distributive impact of a fuel subsidy may be reasonably expected to be progressive. García and Salvato [2005] analyzed fuel subsidies in Venezuela, taking the year 2001 as their basis of analysis.²⁹

Table 11 presents the estimation of the fuel subsidy in Venezuela, particularly gasoline, diesel fuel and LPG. The total cost of one liter of these fuels at a gas station pump dispenser, including excise taxes, is US\$ 15.2 cents. The amount of the subsidy is determined by comparing this value with the Free on Board (FOB) export price,³⁰ the per liter subsidy being estimated at US\$ 11.0 cents for gasoline, US\$ 14.3 for diesel and US\$ 2.4 for LPG. Considering in addition the domestic consumption of these fuels, the annual subsidy to fuels in Venezuela is estimated to amount to almost 2 GDP points (1.88%), namely: gasoline 1.16%, diesel 0.65% and LPG 0.07%. It should be noted that the year taken as the basis for the analysis was 2001; hence, considering the current price of oil and that the sales price at the domestic market has practically remained unchanged, the amount of the current subsidy is definitely higher than the one presented here.

²⁸ When households are sorted according to their *per capita* income.

²⁹ The following is a summary of the results obtained by García and Salvato [2005]. For a review of methodological details, see the original paper by the authors.

³⁰ The gasoline FOB price free of taxes and transport expenses at the coast of the Gulf of Mexico, which concentrates a significant percentage of the exports to United States, a country that represents nearly half of Venezuela's hydrocarbon exports.

TABLE 11
VENEZUELA - FUEL SUBSIDY

	US\$ cents /ltr
Production, Refining, Transportation and Storage	8.9
Marketing Margin	3.2
Excise Tax	3.1
<i>Total Cost PDVSA + Tax</i>	<i>15.2</i>
Domestic Market Selling Price	
Gasoline	11.5
Diesel	6.6
LPG	16.0
FOB Export Price	
Gasoline	22.6
Diesel	20.9
LPG	18.4
Subsidy per liter	
Gasoline	11.0
Diesel	14.3
LPG	2.4
Domestic Consumption	As a %
Gasoline	58%
Diesel	25%
LPG	17%
<i>Total</i>	<i>100%</i>
Annual Subsidy Amount	As % GDP
Gasoline	1.16
Diesel	0.65
LPG	0.07
<i>Total</i>	<i>1.88</i>

Source: García and Salvato [2005].

Table 12 shows the distribution of fuel subsidies both by product and destination (end consumer, passenger transportation, cargo transportation). It should be noted that as a consequence of the low price of gasoline, on account of the subsidy, even passenger transportation carriers are intensive users of this fuel and only cargo transportation is diesel-intensive. This remark is relevant, since authors García and Salvato only consider the distributive impact of the gasoline subsidy.

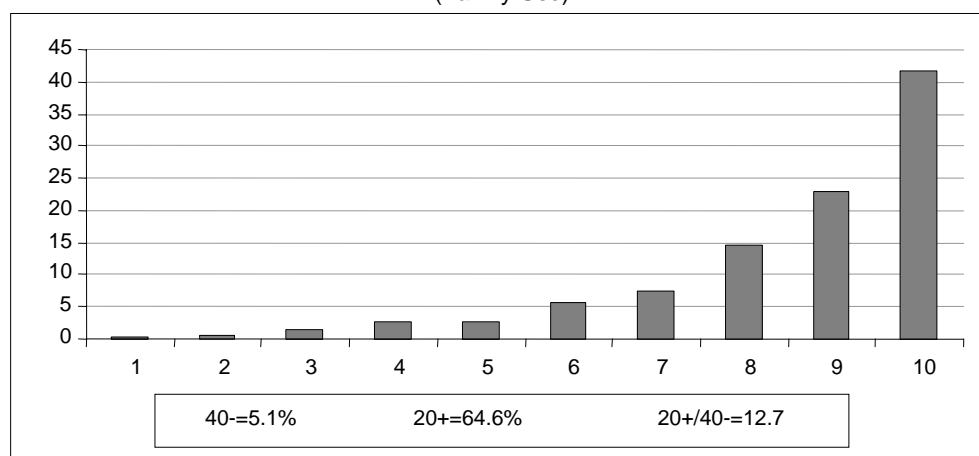
TABLE 12
VENEZUELA - FUEL SUBSIDY DISTRIBUTION

1. By Product	% of GDP
<i>Gasoline</i>	1.16
Direct to Consumer	0.58
Indirect	0.58
<i>Passenger Transportation</i>	0.42
<i>Cargo Transportation</i>	0.16
<i>Diesel</i>	0.65
Direct to Consumer	0.01
Indirect	0.64
<i>Passenger Transportation</i>	0.13
<i>Cargo Transportation</i>	0.51
<i>LPG</i>	0.07
Direct to Consumer	0.01
Indirect	0.06
2. By Destination	
Direct to Consumer	0.60
Passenger Transport	0.56
Cargo Transport	0.67
<i>Total</i>	1.83

Source: García and Salvato [2005].

As expected and as shown in the following figure, if we only consider gasoline sales for privately used motor vehicles (direct subsidy to end consumers), the subsidy will strongly favor the rich, because it will primarily benefit the highest-income households. In fact, 64.6% of the subsidy benefits the richest 20%, while only 5.1%, almost 13 times less, benefits the poorest 40%.

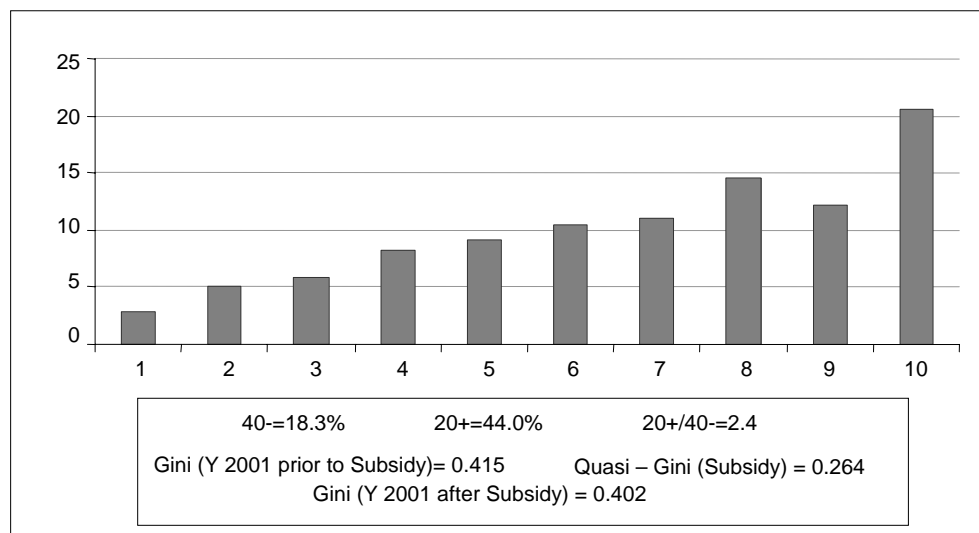
FIGURE 2
VENEZUELA - DISTRIBUTION OF SUBSIDY FOR MOTOR VEHICLES
(Family Use)



Source: Prepared by the authors based on García and Salvato [2005].

When considering the total distributive impact of the subsidy, it turns out to be progressive, as expected: the quasi-Gini index of the subsidy (0.264) is lower than the pre-subsidy Gini index (0.415). Hence, the Kakwani index is negative ($K = -0.151$) and the after-subsidy income distribution improves slightly (the Gini index is now 0.402). However, the total subsidy also benefits the wealthiest: while 44.0% of the subsidy benefits the richest 20% of the population, the poorest 40% is benefitted with only 18.3%, almost two and a half times less.

FIGURE 3
VENEZUELA - DISTRIBUTION OF TOTAL GASOLINE SUBSIDY



Source: Prepared by the authors based on García and Salvato [2005].

Excise Taxes on Alcoholic Beverages

As can be seen in Tables 13 and 14, excise taxes on alcoholic beverages in the Andean countries are: (1) progressive when households are ordered by their *per capita* consumption and the progression of effective tax/consumption ratio is considered, with the only exception of Ecuador, and (2) regressive when households are ordered on the basis of *per capita* income and the progression of the effective tax/income ratio is considered.

Roughly speaking, it might be stated that: (1) alcoholic beverages, globally considered, have a higher share in the consumption basket of the well-off and (2) that the poor spend a greater percentage of their income on alcoholic beverages than the rich. It should be particularly borne in mind, however, that the "poor" and the "rich" do not necessarily coincide in one and the other statement, because ordering households either by *per capita* consumption or by *per capita* income is likely to yield different results.

In any case, it is important to point out that the tax has an irrelevant redistributive role. In the case of Colombia, the transfer from 50% of the poorest households to 50% of the richest households, as a result of the regressivity of the tax, is only 0.05% of the total after-tax income (when deciles are designed according to the household *per capita* income).

TABLE 13
ALCOHOLIC BEVERAGES (INCLUDING BEER)
(Deciles by Household Consumption)

1. Progressivity	Bolivia (1)	Colombia	Ecuador	Peru
Effective Tax/ Consumption Ratio (as a %)				
1st -	0.04	0.62	0.04	0.30
2nd -		0.71	0.05	0.30
2nd +		1.08	0.06	0.70
1st +	0.10	1.01	0.04	0.60
Gini, Pre-Tax Spending	0.472	0.518	0.346	0.470
Quasi-Gini, Alcoholic Beverages	0.490	0.525	0.300	0.527
Kakwani (if < 0 => regressive; if > 0 => progressive)	0.018	0.007	-0.046	0.057
2. Redistribution				
Gini, Spending After Tax	0.472	0.518	0.346	0.470
Transfer from 50%+ to 50%- (or from 50%- to 50%+)	0.00%	0.00%	-0.02%	0.02%
Losers	4	5, 6 and 9	1 to 8	8 and 9
3. Who Pays the Tax				
40% -	7%	9%	21%	9%
20% +	51%	57%	39%	56%
20% + / 40% -	7.1	6.6	1.9	6.3

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Arteta [2005] and Haughton [2005].

TABLE 14
ALCOHOLIC BEVERAGES (INCLUDING BEER)
(Deciles by Household Income)

1. Progressivity	Bolivia (1)	Colombia	Ecuador	Peru	Venezuela
Effective Tax/Income ratio (%)					
1st -	0.28	1.10	0.07	2.20	0.98
2nd -		1.27	0.06	0.90	0.78
2nd +		1.08	0.04	0.60	0.64
1st +	0.09	0.79	0.04	0.40	0.43
Gini, Pre-Tax Income	0.556	0.537	0.408	0.535	0.423
Quasi-Gini, Alcoholic Beverages	0.415	0.432	0.313	0.425	0.287
Kakwani (if < 0 => regressive; if > 0 => progressive)	-0.141	-0.105	-0.095	-0.110	-0.136
2. Redistribution					
Gini, After-Tax Income	0.556	0.538	0.408	0.536	0.424
Transfer from 50%+ to 50%- (or from 50%- to 50%+)	0.00%	-0.05%	0.00%	0.03%	-0.04%
Losers	1 to 4	3 to 7	1 to 7	1, 2, 6 and 9	1 to 9
3. Who Pays the Tax					
40% -	14%	13%	21%	15%	15%
20% +	48%	49%	41%	50%	44%
20% + / 40% -	3.3	3.8	1.9	3.3	2.9

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Arteta [2005]; Haughton [2005]; García and Salvato [2005].

Excise Taxes on Soft Drinks

As shown in Tables 15 and 16, in the three Andean countries (Bolivia, Ecuador and Peru) about which there was data available, excise taxes on soft drinks were regressive when households were ordered both by (1) their *per capita* spending and (2) their *per capita* income. Again, based on this it might be said, roughly speaking, that (1) soft drinks, globally considered, have a higher share in the consumption basket of the poorest households and (2) that the poorest households spend a greater percentage of their income on alcoholic beverages than the rich ones. However, we should once again bear in mind that the "poor" and the "rich" do not necessarily coincide in one and the other statement, because ordering households either by *per capita* consumption or by *per capita* income is likely to yield different results.

Again, it should be stressed that the redistributive effect of excise taxes on soft drinks is almost insignificant.

TABLE 15
EXCISE TAXES ON SOFT DRINKS
(Deciles by Household Consumption)

1. Progressivity	Bolivia (1)	Ecuador	Peru
Effective Tax/ Consumption Ratio (as a %)			
1st -	0.03	0.06	0.11
2nd -		0.07	0.13
2nd +		0.04	0.11
1st +	0.04	0.02	0.07
Gini, Pre-tax Consumption	0.472	0.346	0.470
Quasi-Gini, Soft Drinks	0.458	0.183	0.365
Kakwani (if < 0 => regressive; if > 0 => progressive)	-0.014	-0.163	-0.105
2. Redistribution			
Gini, After-Tax Consumption	0.472	0.346	0.470
Transfer from 50%+ to 50%- (or from 50%- to 50%+)	0.00%	-0.02%	-0.01%
Losers	3 and 4	1 to 7	2 to 9
3. Who pays the tax			
40% -	9%	28%	16%
20% +	48%	29%	42%
20% + / 40% -	5.3	1	2.6

Note: (1) Quintiles.

Source: Prepared by authors based on Cossio [2005]; Arteta [2005] and Haughton [2005].

TABLE 16
EXCISE TAXES ON SOFT DRINKS
(Deciles by Household Consumption)

1. Progressivity	Bolivia (1)	Ecuador	Peru
Effective Tax/ Income Ratio (as a %)			
1st -	0.20	0.07	0.57
2nd -		0.07	0.23
2nd +		0.04	0.08
1st +	0.04	0.03	0.05
Gini, Pre-Tax Income	0.556	0.408	0.535
Quasi-Gini, Soft Drinks	0.415	0.246	0.251
Kakwani (if < 0 => regressive; if > 0 => progressive)	-0.141	-0.161	-0.284
2. Redistribution			
Gini, After-Tax Income	0.556	0.408	0.535
Transfer from 50%+ to 50%- (or from 50%- to 50%+)	0.00%	-0.01%	-0.01%
Losers	1 to 4	1 to 6	1 to 7
3. Who Pays the Tax			
40% -	12%	24%	24%
20% +	46%	33%	35%
20% + / 40% -	3.8	1.4	1.4

Note: (1) Quintiles.

Source: Prepared by authors based on Cossio [2005]; Arteta [2005] and Haughton [2005].

Excise Taxes on Tobacco and Tobacco By-Products

As shown in Tables 17 and 18, excise taxes on tobacco are regressive in all Andean countries both: (1) when households are ordered by their *per capita* consumption and the progression of the effective tax/consumption ratio is considered, and (2) when the ranking is made on the basis of the *per capita* income and the progression of the effective tax /income ratio is considered, with the only exception, in this last case, of Ecuador.

Again, based on this, it could be concluded, roughly speaking, that (1) the consumption of tobacco has a greater incidence in the consumption basket of the relatively poor households and that (2) the latter, in addition, spend a greater percentage of their income on tobacco than the relatively richer households (with the exception, as we already said, of Ecuador). The above-mentioned warning is worth repeating: the "poor" and the "rich" do not necessarily coincide in the one case nor in the other, because ordering households either by *per capita* consumption or *per capita* income is likely to yield different results.

The redistributive role of this tax is, again, irrelevant. For instance, in all cases, the Gini index of pre-tax income distribution is approximately the same as the Gini index of after-tax income distribution.

TABLE 17
EXCISE TAXES ON TOBACCO BY-PRODUCTS
(Deciles by Household Consumption)

1. Progressivity	Bolivia (1)	Colombia	Ecuador	Peru
Effective Tax/ Consumption Ratio (as a %)				
1st -	0.09	0.85	0.08	0.09
2nd -		0.72	0.08	0.10
2nd +		0.16	0.07	0.08
1st +	0.06	0.12	0.08	0.08
Gini, Pre-Tax Spending	0.472	0.518	0.346	0.470
Quasi-Gini, Tobacco by-Products	0.469	0.244	0.343	0.466
Kakwani (if < 0 => regressive; if > 0 => progressive)	-0.003	-0.274	-0.003	-0.004
2. Redistribution				
Gini, After-Tax Spending	0.472	0.518	0.346	0.470
Transfer from 50%+ to 50%- (or from 50%- to 50%+)	0.00%	0.00%	-0.02%	0.00%
Losers	1, 2 and 5	1 to 3 and 5	1 to 9	2 and 7
3. Who Pays the Tax				
40% -	14.3%	26%	20%	13%
20% +	57.2%	38%	44%	53%
20% + / 40% -	4.0	1.5	2.2	4.1

Note: (1) Quintiles.

Source: Prepared by authors based on Cossio [2005]; Zapata and Ariza [2005]; Arteta [2005] and Haughton [2005].

TABLE 18
EXCISE TAXES ON TOBACCO AND TOBACCO BY-PRODUCTS
(Deciles by Household Income)

1. Progressivity	Bolivia (1)	Colombia	Ecuador	Peru	Venezuela
Effective Tax/ Income Ratio (as a %)					
1st -	0.53	0.98	0.08	0.28	1.97
2nd -		0.55	0.09	0.17	1.15
2nd +		0.15	0.18	0.06	0.65
1st +	0.04	0.11	0.17	0.05	0.34
Gini, Pre-Tax Income	0.556	0.537	0.408	0.535	0.423
Quasi-Gini, Tobacco by-Products	0.336	0.235	0.463	0.369	0.181
Kakwani (if < 0 => regressive; if > 0 => progressive)	-0.220	-0.302	0.056	-0.166	-0.242
2. Redistribution					
Gini, After-Tax Income	0.556	0.538	0.407	0.535	0.425
Transfer from 50%- to 50%+ (or from 50%+ to 50%-)	0.00%	-0.05%	0.00%	-0.01%	-0.08%
Losers	1 to 4	1 to 5	6 and 8 to 10	1 to 7	1 to 8
3. Who Pays the Tax					
40% -	20%	28 %	11%	19%	23 %
20% +	43%	37%	50%	44%	37 %
20% + / 40% -	2.1	1.3	4.6	2.4	1.6

Note: (1) Quintiles.

Source: Prepared by authors based on Cossio [2005]; Zapata and Ariza [2005]; Arteta [2005]; Haughton [2005]; García and Salvato [2005].

Excise Taxes on Motor Vehicles

As expected, the excise tax on motor vehicles is progressive in the Andean countries, where only the richest households have their own motor vehicle(s); therefore, as shown in Table 19, more than 85% of the tax, as reported in household surveys, is borne by the richest 20% of households (86% in Bolivia, 87% in Peru and 89% in Ecuador, the countries for which data was available). This high progressivity is further reflected on the high quasi-Gini indexes of the tax, which, in all cases, is clearly distributed more unequally than the pre-tax income.

However, in spite of this high progressivity, it should be underscored, once again, that the redistributive impact of the tax is very scarce: as shown in Table 19, the Gini index of after-tax income remains almost unchanged as compared to the pre-tax Gini index.³¹ As a matter of fact, the total excise tax collection is close to 1%, except for Bolivia and Peru, where the tax burden on fuels is significant.

TABLE 19
EXCISE TAXES ON TOBACCO ON MOTOR VEHICLES
(Deciles by Household Income)

1. Progressivity	Bolivia (1)	Ecuador	Peru
Effective Tax/ Income Ratio (as a %)			
1st -	0.00	0.00	0.00
2nd -		0.00	0.02
2nd +		0.19	0.13
1st +	0.65	0.30	0.28
Gini, Pre-Tax Income	0.556	0.408	0.535
Quasi-Gini, Motor Vehicles	0.724	0.802	0.823
Kakwani (if < 0 => regressive; if > 0 => progressive)	0.168	0.395	0.288
2. Redistribution			
Gini, After-Tax Income	0.555	0.407	0.535
Transfer from 50%+ to 50%-	0.05%	0.03%	0.02%
Losers	5	10	10
3. Who Pays the Tax			
40% -	1%	0 %	1%
20% +	86%	89%	87%
20% + / 40% -	62	n/a	79

Note: (1) Quintiles.

Source: Prepared by authors based on Cossio [2005] and Haughton [2005].

³¹ It is necessary to point out that consumption surveys often include utility vehicles of some small or medium-sized family businesses that should not be considered as household spending; in any case, this is not expected to alter the results substantially.

D. Personal Income Tax

Personal income tax in the Andean countries, like in most Latin-American countries, has two distinct characteristics: it is highly progressive but has a weak redistributive impact as a result of its poor collection.

In fact, as observed in Table 20, the Kakwani indexes show that the personal income tax is the most progressive tax in each of the Andean countries. (Bolivia is one of the few Latin American countries that does not impose any tax on personal income.) In all cases, the only loser³² with the introduction of this tax is the wealthiest 10%, who always pays more than 90% of the tax, with the exception of Peru.

TABLE 20
PERSONAL INCOME TAX
(Deciles by Household Income)

1. Progressivity	Colombia	Ecuador	Peru	Venezuela
Effective Tax /Income Ratio (as a %)				
1st -	0.02	0.01	3.11	0.00
2nd -	0.08	0.04	1.06	0.00
2nd +	0.05	0.89	1.11	0.00
1st +	3.07	2.56	1.67	0.99
Gini, pre-tax Income	0.537	0.408	0.535	0.423
Quasi-Gini i, Personal Income Tax	0.894	0.831	0.582	0.840
Kakwani (if < 0 => regressive; if > 0 => progressive)	0.357	0.423	0.047	0.417
2. Who Pays the Tax				
40% -	0%	0%	10%	0%
20% +	99%	93%	64%	100%
20% + / 40% -	497.0	311.0	6.7	n/a
<i>Memo: Tax collection as % of GDP</i>	0.7	0.7	1.1	0.2

Source: Prepared by the authors based on Zapata and Ariza [2005]; Arteta [2005]; Houghton [2005]; García and Salvato [2005].

Yet, its redistributive impact is very limited. For instance, as shown in Table 21, the transfer from the richest 50% to the poorest 50% of households accounts for, at the most, 0.22% of the total after-tax income in the case of Ecuador. If seen from a different perspective, the same table shows that the change in the total income share of the richest 10% -which is nothing other than the transfer made by the richest 10% to the rest of the society- does not amount to more than 1%. In Colombia, for instance, the richest 10% receives 44.5% of the total income before personal income tax, while after the tax, their income share decreases only to 43.7%.

³² The term "loser", in the sense used in this paper, can be defined as the decile whose share in pre-tax income distribution exceeds its after-tax share.

The reason for this is the poor collection of the tax, which only in Peru accounts for 1% of the GDP (Table 20). It should be noted, for instance, that in Colombia the maximum marginal (nominal) tax rate is 35%, while the effective tax rate imposed on the richest 10% is only slightly higher than 3%. Likewise, in Peru, the maximum marginal (nominal) tax rate is 30%, while the effective tax rate imposed on the richest 10% of households is only 1.7%.

TABLE 21
INCOME SHARE OF THE RICHEST 10% BEFORE AND AFTER PERSONAL INCOME TAX

	Change in Income Share from 10+			Transfer from 50+ to 50-
	Pre-tax	After tax	Transfer	
Colombia (03)	44.5	43.7	-0.80	-0.15
Ecuador (03)	29.9	29.4	-0.50	-0.22
Peru (00)	41.2	41.1	-0.13	-0.02
Venezuela (03)	41.9	41.7	-0.25	-0.10

Source: Prepared by the authors based on Zapata and Ariza [2005]; Arteta [2005]; Haughton [2005]; García and Salvato [2005].

Even though public expenditure, as will be seen below, is deemed to be a suitable income distribution tool, the highly unequal distribution of income in the Andean countries and, particularly, the high share of the richest 10% in the total income -these characteristics were commented in the first chapter- call for a redesign of the personal income tax in the countries of the region in order secure greater tax collection and, consequently, enhance the redistributive capacity. Thus, the apparent high progressivity of the personal income tax that prevails today will become a concrete and effective tool rather than a purely "theoretical or cosmetic" one.

IV. PROGRESSIVITY AND THE REDISTRIBUTIVE CAPACITY OF PUBLIC SOCIAL EXPENDITURE

A. Growth Factors and Evolution of State Expenditure in the Andean Countries

There are certain factors that put pressure on the fiscal policy of developing countries by increasing the demand for public goods and services. The Andean countries have also been hit by this trend. Public expenditure, particularly transfer payments for welfare and social services, have gradually been climbing, driven by the increase in income, greater political participation, liberalization of trade and finance transactions, and the aging of the population (Lindert [2004]).³³ This trend was also reinforced by the adoption of the notion of the State as a benefactor -to substitute for social responsibility- and as the main resource allocation agent since the world emerged from the Great Depression of the 1930s, and of the import substitution model that prevailed in the subcontinent midway through last century. With the progress towards liberalization, government expenditure in the latter part of the last century had to replace social regulations, and this drove it ever upwards because such regulations (for instance, price controls or differentiated exchange rates) affected competitiveness in a world characterized by less tariff barriers and more financial integration.

Income Elasticity in the Demand for Public Goods

On the one hand, according to Wagner's law, there is increased pressure for the traditional funding of public goods, driven by the income elasticity of demand (Webber and Wildavsky [1986]). However, two provisos should be added here:

1) Wagner's law assumes the existence of basic public expenditure as a percentage of a country's GDP but fails to consider that, as per capita income grows, an improvement in the way the market works is highly likely and, therefore, government intervention will become less necessary (as government expenditure, according to Tanzi [2004b]).

2) It would be interesting to analyze the cyclic behavior of demand in the developing countries' public expenditure programs, particularly in the Andean countries. We could suspect that a trend opposite to that described by Wagner has developed in some of these countries' public expenditure programs, particularly in those related to health, education, and security services. A rise in income levels increases individual demands for quality private health, education and security, and these individuals stop pressing the government to provide those goods. On the contrary, a strong drop in actual income during the low part of the cycle would mean a return to the demand for these public services, which would then become inferior goods. Therefore, its demand would show a pro-cyclic behavior, adding financial pressure to the government accounts during recessions. Furthermore, such effects are more pronounced when wealth has become more

³³ Lindert defines democracy (or *voice*) as participation in political life, especially female suffrage and executive turnover. In addition to the four factors mentioned above, the author recognizes higher government expenditure when there is greater political and social affinity. This hinges on two conditions, one being a greater social mobility from average to lower income than from average to higher income (which tends to increase the welfare network); the other is a higher ethnic homogeneity, which promotes social and cultural solidarity.

concentrated and essential public services deteriorate (Villela, Roca and Barreix [2005]). Furthermore, its demand would show a pro-cyclic behavior, adding financial pressure to government accounts during recessions.³⁴

Globalization and Rise in Public Expenditure

Rodrik [1998] suggests that there is a positive correlation between the liberalization of an economy and the rise in public expenditure. The liberalization of the economy induced by globalization, together with the volatility of the terms of trade and the concentration of exports in products where that economy has comparative advantages, increase internal risks and create more volatility in domestic income and consumption. The State responds to such growing volatility by means of an increase in public expenditure as a buffer to absorb external shocks. Rodrik then concludes that causality shifts away from external risk onto government spending.

Beyond any objections to Rodrik's empirical analysis (Tanzi [2003]), it is important to note that, for development purposes, the higher efficiency brought about by globalization has killed several -previously protected- non-competitive activities, thus giving rise to a high number of economic agents who will be losers, particularly in the short run. These agents will exercise strong pressure for compensation from the State; governments generally respond to these demands by increasing public spending (early retirement, unemployment insurance, labor retraining programs, etc.).

Along the same lines of thought, the globalization-driven search for efficiency (competitiveness) required to dismantle an entire social safety net usually provided by developing countries' governments through regulations, namely: price controls, minimum wages, a tenure system in government jobs and expensive terminations in the private sector, regulation of rental prices, several subsidized credit schemes, etc. Lifting such regulations and controls also demanded an increase in public social expenditure in Latin America from the 1970s up to now. This has been the social policy strategy implemented by Andean countries, although without the characteristics adopted in Continental Europe, which included high tax pressure and public spending levels (Lindert [2004]).

Convergence of States' Size due to Trade and Finance Liberalization

Globalization also introduced upward pressures in developing countries' public expenditure through growing infrastructure needs. Such needs, which are ever present, are multiplied when the importance of foreign trade increases to the point of becoming significant hurdles if the government, the usual provider of physical infrastructure, does not give a fast response.

³⁴ Moreover, the evolution of public spending partially contradicts Wilensky's Law [1975]. This law asserts that public social security and welfare programs are created when there is a national surplus that makes these programs possible. Western democracies have been particularly able to set up programs like these by increasing tax pressure, given that the increase in the debt service has been offset by decreasing military expenses. It is clear that, in Latin America, expense growth is not accompanied by higher taxes as proposed by the Mean Voter Theorem, which states that the distributive conflict cancels the difference between the mean income and the median income. Probably, both Wilensky's Law and the Mean Voter Theorem will consolidate with the democratic process and the State will take over the surplus.

The previous arguments, therefore, show that globalization induces a hike in public spending in most developing countries. Latin American countries seem to have room for improving their tax efforts since they are currently below their tax capacity, which validates the option to enhance tax collection as a way to meet the higher government spending needs. However, the key in these cases lies in increasing the efficiency of public expenditure.

But globalization pushes tax collection down, so that the main concern of developed countries -which show much higher public expenditure levels- is to reduce the tax pressure, thus reducing the government expenditure funded by the tax pressure. In several industrialized countries, public expenditure, as a share of GDP, has fallen sharply in the last few years (Tanzi [2004a]).

In short, globalization and integration processes seem to be driving the size of States in opposite directions, depending on whether they are developed or developing countries: (1) the former are downsizing because they find it impossible to maintain the collection levels required to keep the same funding of the welfare state; (2) in developing countries, the State is getting bigger to mitigate the negative effects and leverage the positive effects of globalization and integration processes.

Social Security Expenditure

However, there are certain trends against a larger government participation in some relevant fields, such as that of social security. Despite having very young populations, a drop in birth rates and a rise in life expectancy have started to exert pressure on public finance, as noted by the development of the concept of *fiscal disposable income*. For that reason, Andean countries, like their Latin American peers, introduced structural reforms in their social security programs, replacing their pay-as-you-go systems -in Bolivia in 1997, in Colombia in 1994, in Peru in 1993 and in Ecuador in 1994- by those described in the following table.

TABLE 22
STRUCTURAL SOCIAL SECURITY REFORMS

Model, Country, and Date of Enforcement of the Reform	System	Contribution	Benefit	Financial System	Admin.
<i>Substitution Model</i> Bolivia: May 1977	Private	Defined	Not Defined	Consumer Price Index (CPI)	Private
<i>Parallel Model</i> Peru: June 1993	Public or Private	Not defined <i>Defined</i>	Defined <i>Not Defined</i>	Pay-as-you-go <i>CPI</i>	Public <i>Private</i>
Colombia: April 1994					
<i>Composite Model</i> Ecuador: January 2004	Public & Private	Not defined <i>Defined</i>	Defined <i>Not defined</i>	Pay-as-you-go <i>CPI</i>	Public <i>Multiple</i>

Source: Medici [2005].

Although pressure on the pension system is not a short-term issue in the Andean countries, whose population pyramids have a wide base, it should be noted that actuarial systems, privatized or otherwise, do not usually solve the minimum pension adequacy and coverage issues. For that reason,

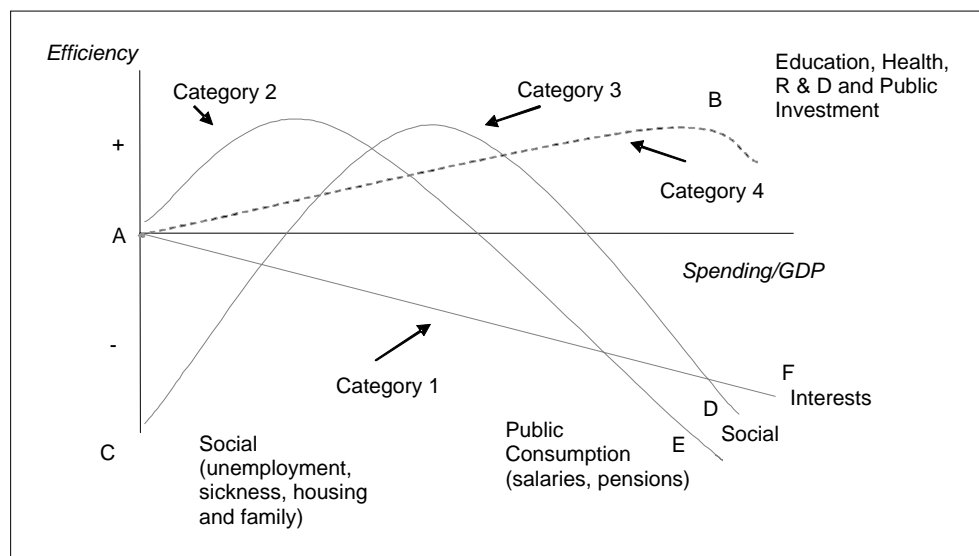
pensions with a low replacement level will pose a challenge to fiscal policy in the long run. Indeed, despite the improvement in contributions resulting from the taxpayers' interest in individual accounts and the savings incentive, as well as the support to the development of a capital market this might entail, the Andean countries' economies have structural barriers preventing the enlargement of the pension systems' coverage. These barriers are the following: (1) significant informality in the labor market (about 60% of the workers in Bolivia and Colombia, and close to 70% in Peru are in the informal labor market (Mesa Lago [2004]; Arena and Mesa Lago [2006] and (2) the high number of workers receiving a meager salary (for instance, 80% of the workers in the system pay salary contributions between 1 and 2 minimum wages in Colombia (Arenas and Llanes [2006] and similarly in Peru, with an increasing fiscal commitment through pension recognition and leveling option bonds in both systems, called *Bonos Complementarios* (Arenas [2005]).

Typology of Expenditure

An empirical relationship can be established between public expenditure and growth, which is generally positive within a narrow range according to the type of expenditure. Thus, a typology may be defined as a mix of functional spending and social protection classification, with four categories in an increasing order of positive impact on growth: (1) interests (AF line), which adversely affect growth; (2) public consumption, wages and payment of pensions and survivors' pensions (AE); (3) sickness and unemployment insurance, family and children, housing and social emergency (CD) which, at a very low level, make it difficult for women and the socially-excluded groups to get a job but which, from a certain level onwards, act as a disincentive to labor supply, and (4) expenses in education, health, research and development, as well as physical investments (AB), which provide the highest positive impact (European Commission [2002]; Martner and Aldunate [2006]).

This work focuses on a distributive analysis of the last expense type, and supplements it with focused expenses (3) and pensions (2).

FIGURE 4
QUALITY AND EFFICIENCY OF PUBLIC SPENDING



Source: Martner and Aldunate [2006].

State Evolution and Public Expenditure in the Andean Community Member Countries

As seen in Table 23, public spending by the central government and the non-financial public sector (NFPS) evolved differently in the various Andean countries. Colombia shows an increase in both items, while the size of the NFPS tends to decrease in Bolivia, Ecuador, and Peru. It is interesting to note that the NFPS of Venezuela and Colombia are among the highest in the subcontinent. As stressed by Martner and Aldunate [2006], the NFPS is a better descriptor of State structures resulting from privatization processes. Although these processes were extremely vigorous during this period, resulting in a significant reduction of the economic burden of public enterprises, the growth of strategic companies that remained entirely state-owned, particularly in the natural resources area, offset the initial reduction of the government's participation in economic activities.

TABLE 23
EVOLUTION OF THE SIZE OF THE STATE AND THE ELASTICITY OF SOCIAL SECURITY AND WELFARE EXPENSES AGAINST GDP
(Andean countries, 1990)

	Public Spending, 2003 (% of GDP)		Variation from 1990 (% of the GDP)		Income Elasticity
	Central Government	Non Financial Public Sector	Central Government	Non Financial Public Sector	Elasticity of Social Expenses
<i>Bolivia</i>	28.3	32.8	10.8	-2.3	2.3
<i>Colombia</i>	20.2	38.9	10.9	18.3	3.4
<i>Ecuador</i>	18.7	24.5	4.3	-1.8	2.4
<i>Peru</i>	16.8	n/a	-0.9	n/a	2.2
<i>Venezuela</i>	27.1	31.4	2.2	-3.2	n/a

Source: Martner and Aldunate [2006].

Different trends can be found within the growth of the public sector, pushed by factors such as increasing income elasticity, trade and finance liberalization, and regional integration. There is a growing number of private instruments such as pension systems or health services that supplement and sometimes replace the public sector. This has adversely affected the ability of fiscal spending to influence upon the distribution of income and its evaluation. Yet, primary social spending in the Andean countries exhibits a sustained growth of government action, reflected in significantly high income elasticity since the 1990s.

B. Some Methodological Considerations

1) As in most literature on the subject, this work only considers what is usually called public social expenditure, that is to say, public spending on education, health, pensions, and targeted social public spending (or welfare services). The reason is that there are no generally accepted principles with which to identify and conduct a financial assessment of the beneficiaries of all other public spending programs (defense, justice, administration in general).

What we shall call here targeted social public spending could be defined -in line with Lindert; Skoufias and Shapiro [2005]-³⁵ as usually non-contributory public transfers, in money or in kind with the main purpose of reducing poverty and income distribution inequality by providing social assistance targeted to poor individuals or households.

2) It should be pointed out that this document introduces no considerations on the quality of public social expenditure. If certain public spending -for instance, in primary education- is progressive, an improved income distribution will be computed once such expenses have been received, and they will implicitly be considered positive. This will not necessarily be the case if, in actual fact, public education leads to students' failure and, consequently, to their inability to get better remunerated jobs.

Likewise, it is assumed that all budget items are received by their beneficiaries, that is to say, that there are no public transfer deviations due to, for instance, corruption. If that were not the case, the impact of public spending would be overestimated. On the other hand, no consideration is given either to positive externalities, present or future, that may arise from these public disbursements.

In addition, without disregarding its significance, the aim of this work is neither to evaluate the administration costs required to perform certain public transfers nor to analyze their impact on the supply of labor.

Finally, neither the efficiency of public spending nor whether it might be more productive in the private sector will be discussed here. However, its "efficiency" (the quality of public spending) may be classified under four groups, according to its impact on economic growth and employment.

3) As in the tax system, an analysis was conducted of the progressivity and redistributive incidence of the various public social expenditure (PSE) items, considering: (a) the effective PSE/Income ratio for household deciles ordered by *per capita* income, and (b) the effective PSE/Consumption ratio for household deciles ordered by *per capita* consumption. However, the only reference made in this chapter will be to an analysis of the income.

4) An analysis of the impact of public social expenditure on household income distribution requires surveys that collect information on the use of public services (basically, health and education) and the transfers received from the public sector (pensions, subsidies, etc.) by the sample households selected. Household income and expenditure surveys (also called family budget surveys) usually contain information, more or less detailed, on transfers from the public sector, but fail to collect information on the (free) use of goods and services provided by the State, since they only include questions on the monetary disbursements actually made by the household. Surveys that do collect such information are the so-called living conditions surveys. In the studies performed (Tables 24 and 25):

a) the information required to allocate any category of public social expenditure in Venezuela was not available;

³⁵ The authors provide a careful definition of social assistance, comparing it with social security.

b) in Ecuador, it was only possible to allocate pensions and the Human Development Bond (a money transfer by the Government) to the various deciles;

c) in Peru, pensions were not allocated. Health care services effectively provided by public hospitals were computed, representing 1 of the 2.5 percentage points of the GDP which health care expenses account for today (EsSALUD, the national health care system, which absorbs the remaining 1.5 percentage points, was not allocated);

d) in Colombia, pensions were not allocated. The sole item considered was the subsidized health care system (-0.8% of the GDP, from the total 4.3% public spending in health) and only housing subsidies were allocated, a very minor portion of the 2.7 GDP percentage points earmarked to targeted social public spending; and

e) in Bolivia, targeted social public spending was not considered. This item represented 1.6% of the GDP in 2000, the year considered in the analysis.

TABLE 24
PUBLIC SOCIAL EXPENDITURE IN THE ANDEAN COMMUNITY
(Percentage considered as a % of GDP)

	Bolivia 2000	Colombia 2003	Ecuador 2003	Peru 2000
Education	5.2	4.6	---	2.5
Health	2.8	0.8	---	1.0
Pensions	4.4	---	2.2	---
Rest of the PSE	---	0.0	0.7	1.9
<i>Total PSE considered</i>	12.4	5.5	3.0	5.5
<i>Total PSE</i>	14.0	14.3	6.9	10.1
<i>% PSE considered</i>	88.9	38.3	43.2	54.4

Source: Arteta (2005), Cossio (2005), Haughton (2005), Zapata and Ariza (2005)

The following table shows the distribution of public social expenditure in the Andean countries.

TABLE 25
PUBLIC SOCIAL EXPENDITURE IN THE ANDEAN COMMUNITY

1. As a % of GDP					
	Bolivia 2000	Colombia 2003	Ecuador 2003	Peru 2000	Venezuela 2003
Education	5.2	4.6	2.3	2.5	4.5
Health	2.8	4.3	1.2	2.5	1.5
Pensions	4.4	2.7	2.2	3.1	3.3
Rest of the PSE	1.6	2.7	1.1	1.9	2.5
<i>Total PSE</i>	<i>14.0</i>	<i>14.3</i>	<i>6.9</i>	<i>10.1</i>	<i>11.8</i>

TABLE 25 (Continued)

2. Structure					
	Bolivia 2000	Colombia 2003	Ecuador 2003	Peru 2000	Venezuela 2003
Education	37%	32%	34%	25%	38%
Health	20%	30%	17%	25%	13%
Pensions	32%	19%	33%	31%	28%
Rest of the PSE	11%	19%	16%	19%	21%
<i>Total PSE</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
Memo Item – Poverty					
	Bolivia 2002	Colombia 2003	Ecuador 2002	Peru 2001	Venezuela 2002
	62%	52%	49%	55%	49%
Memo Item –Extreme Poverty					
	Bolivia 2002	Colombia 2003	Ecuador 2002	Peru 2001	Venezuela 2002
	37%	17%	19%	24%	22%

Note: (*) In urban areas.

Source: ECLAC [2005a].

It should be stressed that there are significant differences as to level and functional classification among countries, although, in percent terms, expenditures on education and pensions predominate. Unfortunately, the degree of poverty is more homogeneous -around 50% of the population- and extreme poverty -above 20%, with the exception of Bolivia, where it exceeds 35%-.

5) As already stated, the local progressivity indicator more frequently used is the average rate progression. According to this indicator, a specific public spending item will be progressive if the public expenditure received, expressed as a percent of the household income -average rate- decreases when moving up in the households' income scale.

As with taxes, the progressivity or regressivity of a public expenditure item may also be determined by comparing the Lorenz curve of household income prior to fiscal policy action with the concentration curve of the public expenditure concerned. As already stated, the concentration curve measures, for each cumulative percentage of the population, the cumulative percentage of the total public expenditure received.³⁶ A specific public spending item will be progressive throughout the entire distribution if, and only if, its concentration curve is always above the Lorenz curve of household income prior to the fiscal policy action (Lorenz dominance).

If there is no Lorenz dominance because the curves cross over one another one or more times, any calculation representing inequality in a single digit -such as the Gini coefficient- will allow a

³⁶ If X percentages are represented relative to Y's distribution quantiles, there is an X *versus* Y concentration curve. (Lambert [1989]).

complete ranking of income distributions, that is any distribution pair may be sorted unambiguously (Lambert [1989]). Kakwani's progressivity index, based on Gini's coefficient, is the most popular of all global progressivity indicators. It allows the indication of the progressivity (or lack of it) of a certain public expenditure in any case. For instance, for public spending on health, Kakwani's indicator is defined as:

$$K = \text{quasi-Gini coefficient (PSE on Health)} - \text{Gini (Pre-fiscal policy income)}.$$

As seen above, the quasi-Gini ratio of public spending is calculated in a similar way as the Gini index of income, but on the public spending concentration curve. This explains the semantic difference between them.

If $K < 0$, that is if public spending is more equitably distributed than income before fiscal policy, such expenditure contributes to reducing income distribution inequality; hence, it is deemed progressive. If, on the contrary, $K > 0$, public spending is regressive.

But equally or more relevant than the question regarding progressivity is the question of whether public social expenditure is pro-poor or pro-rich. If the total public spending percentage benefitting households diminishes as their income level increases, the spending is said to be pro-poor. Otherwise, the spending is defined as pro-rich. Technically speaking, a public social expenditure item will be pro-poor if its quasi-Gini distribution coefficient is negative.

Clearly, a certain public social expenditure program may be progressive -its significance relative to the income of households decreases as their income increases- and, at the same time, pro-rich -the richest strata benefit from a higher percentage of the public spending in question-. A typical case, as will be seen from the results obtained in the Andean countries, is university education.

Finally, as in the case of the tax system, the redistributive impact of the various public social expenditure items was evaluated using the Reynolds-Smolensky index that compares the distribution of income before and after the expense under analysis. At this point, it seems relevant to point out that for each progressive public social expenditure item, this index will promptly and automatically compute an improvement in income distribution. However, this is not very likely to be an effect of spending on education which, even if reaching an acceptable level of quality, requires a process of maturity. As stated by Machinea and Hopenhayn [2005], this is one of the reasons that explain the apparent paradox of income distribution deterioration in Latin America between 1990 and 2002, simultaneously with an increase in the more progressive public social expenditure items (education and health, among others).

C. Public Social Expenditure on Health

Government expenditure on health is progressive in the three Andean countries from which information could be collected for allocation purposes: Bolivia, Colombia, and Peru. In other words, in all three cases, this public spending item is more equitably spent than income before fiscal policy, thus showing a quasi-Gini coefficient lower than that for income distribution and a negative Kakwani index (Table 26).

However, only in Colombia -under a subsidized system- is spending on health pro-poor, that is the percentage of total spending allocated to each decile diminishes when moving up from the poorer to the richer deciles of income distribution. Technically speaking, as already stated, a public spending item is pro-poor when its quasi-Gini coefficient is negative. This happens when the accumulated spending percentage allocated to a specific income distribution point exceeds the accumulated income percentage corresponding to that point (for instance: the two poorest deciles get 5% of the total income and receive 35% of the public spending on health).

TABLE 26
PUBLIC EXPENDITURE ON HEALTH
(Deciles by Household Income)

1. Progressivity	Bolivia (1)	Colombia	Peru
Effective PSE/Income Ratio (as a %)			
1st -	40.9	18.7	17.9
2nd -		9.2	7.3
2nd +		0.2	1.0
1st +	2.5	0.0	0.3
Gini Income before PSE	0.556	0.537	0.535
Quasi-Gini of PSE (if < 0 => pro-poor)	0.252	-0.331	0.006
Kakwani (if < 0 => progressive; if > 0 => regressive)	-0.304	-0.868	-0.529
2. Redistribution			
Gini Income after PSE	0.543	0.527	0.530
Transfer from the 50%+ to the 50 %-	0.65%	0.50%	0.27%
Winners	1 to 4	1 to 6	1 to 6
3. Who Receives the Expenditure			
40% -	26.4%	67.0%	41.0%
20% +	34.8%	3.0%	22.0%
40% - / 20% +	0.8	20.3	1.8
1st -	n/a	19.0%	10.0%
1st +	n/a	1.0%	9.0%
<i>Memo: PSE considered (as a % of GDP) PSE on Health (as a % of GDP)</i>	2.8	4.3	2.5
<i>% PSE on Health considered</i>	100.0%	18.6%	40.0%

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Haughton [2005].

Under the subsidized system, the Colombian poorest 40% receive almost 70% of the public spending on health, while the richest 20% only receive 3%. In Peru, the poorest 40% receive almost twice more than the richest 20% (41% *versus* 22%, respectively). Finally, in Bolivia, the poorest 40% receive almost 25% less of the public spending on health than the richest 20% (26% *versus* 35%, respectively) -always considering households ordered by their *per capita* income-.

Despite Colombia's better targeting of its health-related public spending, the major redistributive effect can be seen in Bolivia. In this country, the redistribution of income distribution caused by this expenditure is equivalent to a 0.7% transfer of income (after public spending) from the richest 50% to the poorest 50% of households (*versus* a 0.5% in Colombia and a 0.3% in Peru). The reason lies in the significance assigned to public spending on health in Bolivia, which amounted to 2.8% of the GDP, *versus* a 0.8% in Colombia and 1% in Peru, during the years considered in the analysis.

D. Public Expenditure on Pre-School, Primary and Secondary Education

In the three countries under analysis, Bolivia, Colombia and Peru, public spending on basic education (pre-school, primary, and secondary education) was not only progressive but also pro-poor. This clearly confirms a contrasting reality: public education (both primary and secondary) is used less and less when moving up from the poorest to the richest households. In other words, the poorest households make a greater relative use of public education.

TABLE 27
PUBLIC EXPENDITURE ON PRE-SCHOOL, PRIMARY AND SECONDARY EDUCATION
(Deciles by Household Income)

1. Progressivity	Bolivia (1)	Colombia	Peru
Effective PSE/Income Ratio (as a %)			
1st -	107.0	67.2	29.8
2nd -		34.6	11.6
2nd +		1.5	0.8
1st +	1.1	0.2	0.3
Gini Income before PSE	0.556	0.537	0.535
Quasi-Gini of PSE (if < 0 => pro-poor)	-0.046	-0.220	-0.088
Kakwani (if < 0 => progressive; if > 0 => regressive)	-0.602	-0.757	-0.623
2. Redistribution			
Gini Income after PSE	0.524	0.499	0.525
Transfer from the 50%+ to the 50 %-	1.60%	1.90%	0.50%
Winners	1 to 3	1 to 7	1 to 7
3. Who Receives the Expenditure			
40% -	45%	56%	47%
20% +	12%	7%	14%
40% - / 20% +	3.7	8	3.3
1st -	n/a	15.1%	11.8%
1st +	n/a	1.0%	7.1%
<i>Memo: PSE as a % of GDP (including University)</i>	6.2	4.6	2.5

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Haughton [2005].

Colombia's 40% poorest households receive a percentage of the budgeted spending for basic education which is almost 9 times higher than that received by the 20% richest households (56% *versus* 7%, respectively), a factor that seems to indicate a better targeting policy (in Bolivia and Peru this ratio is 3.7 and 3.3, respectively). It should, however, be pointed out that this is not targeting in the strict sense of the word, since there is no selection process to enroll children from the poor households and to reject children from relatively richer ones; on the contrary, this is a "natural selection" process. Therefore, if the reason for a greater relative use of public education by the poorest households is that only higher income households can have access to private school -of higher quality- then this would be indicative of a problem rather than an indicator of proper targeting in public spending.

At this point, it should be stated once again that the quality of the education received was not evaluated in the various studies. On the contrary, as the spending on primary and secondary education is pro-poor, a better income distribution is computed once such expenditure has been received, which implicitly considers it as positive. This will not necessarily be the case if, as some experts affirm, assistance to public education in some Latin American countries leads to students' failure and, consequently, to their inability to get better remunerated jobs (Rey de Marulanda, Ugaz and Guzmán [2006]).

The redistributive importance of this item of public spending should be highlighted. In Colombia, for instance, income redistribution is equivalent to an almost 2% transfer of revenue (after that expenditure) from the richest 50% to the poorest 50% of households.

E. Public Expenditure on University Education

In the three countries under analysis public spending on university education is progressive (almost proportional, in Bolivia's case) but, at the same time, it is pro-rich -the percentage of public spending allocated to university education increases when moving from the lowest to the highest income brackets-. This again confirms another contrasting reality: students having a relatively greater access to higher education belong to higher income households.

Public spending on university education benefiting 20% of the higher income households is between two and a half times (Peru) and six times (Bolivia) greater than that benefiting 40% of the lower income households.

Of course, these are not direct implications from the results because when it comes to evaluating educational policy, there are other factors such as the positive externality of a high-level education. Yet, it should be taken into account that the cost defrayed by the State per university student is over five times the cost per primary education student, according to Cossio [2005] and Haughton [2005].

TABLE 28
PUBLIC EXPENDITURE ON UNIVERSITY EDUCATION
(Deciles by Household Income)

1. Progressivity	Bolivia (1)	Colombia	Peru
Effective PSE/Income Ratio (as a %)			
1st -	6.4	0.8	4.9
2nd -		0.9	2.0
2nd +		1.9	1.4
1st +	1.7	0.6	0.7
Gini Income before PSE	0.556	0.537	0.535
Quasi-Gini of PSE (if < 0 => pro-poor)	0.436	0.426	0.362
Kakwani (if < 0 => progressive; if > 0 => regressive)	-0.120	-0.111	-0.173
2. Redistribution			
Gini Income after PSE	0.553	0.536	0.533
Transfer from the 50%+ to the 50%-	0.15%	0.05%	0.11%
Winners	1, 3 and 4	5 to 9	1 to 9
3. Who Receives the Expenditure			
40% -	8%	9%	16%
20% +	44%	44%	40%
20% + / 40% -	5.7	5.0	2.6
1st -	n/a	0.8%	2.8%
1st +	n/a	20.5%	22.4%

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Haughton [2005].

F. Public Expenditure on Pensions

The evaluation of the distributive impact of pensions, whose net effect is felt throughout the life cycle, is a real challenge for an annual approach³⁷ such as the one used here. First of all, it seems clear that there will only be a redistributive effect if there was no equivalent consideration. As stated by Gimeno [2005], an individual capitalization system could not be considered redistributive, just as expenses incurred in services or in a loan are not considered redistributive.

If, in actuarial terms, the pensions received by the current pensioners were higher than the contributions made during their working years, it would be appropriate to include the difference as a public transfer. By the same token, if the pensions received were actually lower than the contributions made during the pensioners' working years, it would be appropriate to consider the difference as a tax. Taking an annual approach, it is not possible to determine whether it is one or the other; this determination can only be made under a life cycle approach (regardless of inherent methodological problems).

³⁷ The only information available was the income received by the sampled individuals in the year of the survey.

Consequently, pensions were included among the original income of households (income before the fiscal policy action) in the studies conducted, under the assumption that they are the (actuarially equivalent) benefit received from previous contributions (just as interests are received from a previous deposit made). In any case, for information purposes, the impact of pensions on the original income distribution is reported for Bolivia and Ecuador.

The main reason for analyzing the impact of pensions in the Bolivian case is its significance: 34% of current expenditures, which is in excess of 4% of the GDP (Cossio [2005]). Such a high percentage results from the fact that, after the 1997 reform of the Bolivian pension system, when an individual capitalization pension scheme entirely replaced the public pay-as-you-go scheme, the old system's pension expenditure was fully covered by the government. Accordingly, this expense is not related to any social policy but to a financial obligation undertaken by the State, which will end at the same time as the lives of its current beneficiaries' end.

As shown in Table 29, public spending on pensions in Bolivia is progressive but pro-rich. Of the Bolivian population, the wealthiest 20% of households receive 39% of all pensions paid, while the poorest 40% receive 23%. In Ecuador, on the contrary, pensions are distributed slightly more unevenly than expenditures before fiscal policy; therefore, they are moderately regressive and their redistributive impact is almost negligible.

TABLE 29
PUBLIC EXPENDITURE ON PENSIONS
(Deciles by Household Income)

1. Progressivity	Bolivia (1)	Ecuador
Effective PSE/Income Ratio (as a %)		
1st -	53.8	0.27
2nd -		0.41
2nd +		0.77
1st +	3.9	0.84
Gini Income before PSE	0.556	0.408
Quasi-Gini of PSE (if < 0 => pro-poor)	0.294	0.487
Kakwani (if < 0 => progressive; if > 0 => regressive)	-0.262	0.080
2. Redistribution		
Gini Income after PSE	0.540	0.408
Transfer from the 50%+ to the 50%-	0.80%	0.00%
Winners	1 to 4	7 to 10
3. Who Receives the Expenditure		
40% -	22.9%	9.8%
20% +	38.4%	51.4%
40% - / 20% +	0.6	0.2
1st -	n/a	0.8%
1st +	n/a	33.4%
<i>Memo: Pensions (as % of the GDP)</i>	<i>4.4</i>	<i>2.2</i>

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005] and Arteta [2005].

G. Targeted Social Expenditure

As stated above, the term targeted social public spending (or social assistance) means, in line with Lindert, Skoufias and Shapiro [2005], usually non-contributory public transfers, in money or in kind, the main purpose of which is to reduce poverty and income distribution inequality by providing social assistance to poor individuals or households.

In 2000, the base year for the analysis of Peru, this item of public social expenditure represented 1.9% of the GDP and basically comprised food transfers. The survey used (see Haughton [2005]) allowed to allocate the following social allowances: "school breakfast", "glass of milk", "soup kitchen", "mothers' club", the government's shopping basket of price-controlled goods ("*Programa de alimentación y nutrición para familias de alto riesgo* – PANFAR"), "food for work", "direct donation of foodstuffs", "baby food or other food for children", school uniforms, and books and school materials.

In Ecuador, the survey used (*Estadística Nacional de Ingresos y Gastos de los Hogares Urbanos* – ENIGHU) allowed the allocation of the Human Development Bond, a monetary transfer representing 0.7% of the GDP in 2003, the base year for the analysis of this country. But this survey does not identify the beneficiaries of other Social Assistance Programs, aggregating 0.4% of the GDP, which, for this reason, have not been reviewed.

At present, approximately 1,166,000 people (including mothers, disabled and older people living in poverty) receive the Human Development Bond. The transfer estimated on the basis of the ENIGHU is much lower than that effectively made by the government because that survey was conducted in urban areas and most people qualifying as beneficiaries of this subsidy live in rural areas, the poorest part of the country (Arteta [2005]).

Also included here are subsidies for the purchase of houses in Colombia, although they represent a smaller share of the total targeted social public spending (2.7 points of the GDP, according to ECLAC [2005a]).

In both Peru and Ecuador, the items under review are very progressive. In other words, these public social expenditure items are more equitably distributed in both cases than income before the fiscal policy action, thus presenting a quasi-Gini coefficient lower than that of income distribution and a negative Kakwani index (Table 30).

Also in both cases, the targeted spending is pro-poor, that is, the percentage of spending allocated to each decile diminishes as moving away from the poorest to the richest income distribution deciles. Technically speaking, as already stated, a public spending item is pro-poor when its quasi-Gini coefficient is negative. In Peru, while the richest 20% of the population receives 9% of all social subsidies, the poorest 40% receives 52%, five and a half times more. In Ecuador, keeping very much in mind the limitation that an urban survey is used to allocate a benefit mostly targeted to rural residents, it has been estimated that the richest 20% receive 13% of the Human Development Bond and the poorest 40% receive 58% of that Bond, almost four and a half times more.

TABLE 30
PUBLIC EXPENDITURE - TARGETED PSE
(Deciles by Household Income)

1. Progressivity	Colombia (1)	Ecuador (2)	Peru (3)
Effective PSE/Income Ratio (as a %)			
1st -	0.6	0.97	44.6
2nd -	0.0	0.54	19.0
2nd +	0.1	0.07	1.0
1st +	0.0	0.01	0.1
Gini Income before PSE	0.537	0.408	0.535
Quasi-Gini of PSE (if < 0 => pro-poor)	0.089	-0.219	-0.191
Kakwani (if < 0 => progressive; if > 0 => regressive)	-0.448	-0.627	-0.726
2. Redistribution	Colombia	Ecuador	Peru
Transfer from the 50%+ to the 50%-Winners	0.0% 1, 3 and 5	0.0% 1 to 7	0.7% 1 to 6
3. Who Receives the Expenditure	Colombia	Ecuador	Peru
40% -	31.3%	58%	52%
20% +	25%	13%	9%
40% - / 20% +	1.3	4.3	5.6
1st -	10%	17%	14%
1st +	14%	4%	2%
<i>Memo:</i>			
<i>PSE as a % of GDP</i>	<i>2.7</i>	<i>1.1</i>	<i>1.9</i>
<i>% of PSE considered</i>	<i>2.0%</i>	<i>66.3%</i>	<i>100.0%</i>

Note: (1) Housing, (2) Human Development Bond, (3) Social Subsidies.

Source: Prepared by the authors based on Zapata and Ariza [2005]; Arteta [2005] and Haughton [2005].

If public spending targeting may be estimated as the ratio between the benefits received by the poorest 40% and the richest 20%, Peru, the country where more information could be collected on all items, shows a better targeting on social subsidies against the rest of the public social expenditure items. Indeed, this ratio is 1.8 for health, 3.3 for basic education, 0.4 for university education and 5.6 for social subsidies, as already described.

V. THE GLOBAL IMPACT OF THE FISCAL POLICY

This chapter presents an evaluation of the joint redistributive impact of the tax system and the public social expenditure. Among other goals, the OECD [2004a] tax microsimulation and service models - more frequently called *tax-benefit* models- aim at facilitating the comparison of the impact of the fiscal policy on individual welfare in countries with different tax and service systems. For the OECD, two examples clearly show the need to consider taxes and transfers (public social expenditure) on a joint basis in order to assess the final impact of the fiscal policy: (1) social assistance transfers are subject to taxes in some countries, and (2) many services are provided through reductions in the tax base or deductions from the personal income tax payments (tax expenditure).³⁸

The *tax-benefit* models simulate the effects of taxes and transfers on family income. Based on each country's rules and regulations, they calculate the direct taxes paid, the social services received and the final net income. The taxes, globally considered, are personal income tax and workers' contributions to Social Security. The major social services are monetary transfers for unemployment (contributory unemployment benefit and unemployment assistance).³⁹ The reality of underdeveloped countries, with their high share of indirect taxation and non-monetary transfers, compels the use of the methodology instituted by the Andean countries due to its comprehensive nature.

A. Impact of the Tax System

These last chapter's comments will focus on the countries about which there was information necessary to allocate a significant percentage of both taxes and public social expenditure. For that reason, any references here shall be to Bolivia, Colombia and Peru; nevertheless, it should be made clear that, contrary to these three countries, the Ecuadorian tax system as a whole is progressive, even considering household income as a welfare indicator. This is basically explained by the fact that VAT is progressive; even when taking income as a reference variable, positive income redistribution is generated, amounting to 2 points of the Gini coefficient.⁴⁰

In order to draw global conclusions from these studies, the taxes must be evaluated in each of the analyses (countries) to see if they represent relevant, similar percentages of the total tax revenue. Indeed, to compare the results of a study that analyzes the impact of taxes representing 90% of Country A's total tax collection with the results of Country B which, due to data collection problems, only considers taxes representing 30% of the total tax collection, does not seem right.

Table 31 shows the percentage of the tax revenue (without Social Security or the State-owned companies' surplus) represented by the taxes considered in the studies of Bolivia, Colombia, and Peru. The percentages are significant (and similar) in all cases, which, in principle, makes it possible to compare the results obtained.

³⁸ Examples cited by Urbanos and Utrilla [2001].

³⁹ For a description of *tax-benefit* models and two applications to the Spanish case, see Pazos and Sastre [2003].

⁴⁰ Basically, the explanation lies in the substantial income distribution improvement compared with data used by Roca and Vallarino [2003], while the quasi-Gini coefficient of the estimated VAT is similar in both studies.

TABLE 31
TAXES
(Deciles by *per capita* Household Income)

1. Progressivity	Bolivia (1)	Colombia	Peru
Effective Tax/Income Rte (as a %)			
1st -	24.34	12.89	36.29
2nd -		10.47	16.05
2nd +		6.67	8.81
1st +	14.06	8.68	9.08
Gini Income before Fiscal Policy	0.556	0.537	0.535
Quasi-Gini for Taxes	0.498	0.532	0.460
Kakwani (if < 0 => regressive; if > 0 => progressive)	-0.058	-0.005	-0.075
2. Redistribution			
Gini Income after Taxes	0.567	0.537	0.543
Reynolds-Smolensky (if < 0 => regressive; if > 0 => progressive)	-0.011	0.000	-0.008
Losers	1 to 4	1 to 3, 6 and 10	1 to 6
Loss of 40% - (% of Income)	-0.5%	-0.1%	-0.5%
Gain of 10% + (% of Income)	1.1%	-0.4%	0.3%
3. Who Pays the Taxes			
40% -	9%	12%	15%
20% +	57%	62%	53%
20% + / 40% -	6.4	5.3	3.6
<i>Memo:</i>			
Tax Revenue – Without Soc. Sec. or SE surplus- (% of GDP)	18.1	15.6	12.2
Taxes Considered (% of GDP)	11.5	7.7	7.6
% of Taxes Considered	63.5	49.4	62.3

Note: (1) Quintiles. SE: State-owned enterprises.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Haughton [2005].

The tax system in these three countries -strictly speaking, the taxes under consideration- is regressive and the most serious deterioration in income distribution resulting from such regressivity is found in Bolivia, where the after-tax Gini value is 1.1 percentage points higher than the Gini coefficient before tax.

The current design of the tax system determines that the population's richest 10% receive a transfer of 1.1% and 0.3% of after-tax income in Bolivia and Peru, respectively, while the poorest 40% in both countries make a transfer of 0.5% of after-tax income. Therefore, in countries with a very poor income distribution, which, as already indicated, results from a very high share of income distribution going to the richest 10% of the population (4.3 and 2.5 times more than the poorest 40% in Bolivia and Peru, respectively), the tax system ends up reinforcing the concentration of income in the richest decile. The issue is not that the tax system should become the income redistribution tool *par excellence* (that is the role of public social expenditure), but it is not unreasonable to state that a redesign and effective collection of personal income tax in the region should help correct this

undesired effect of the current design. It should be noted that, in Colombia, the richest 10% of the population are among the losers and transfer 0.4% of after-tax income to the rest of society.

In the three cases, the population's richest 20% pay between three and a half times (Peru) and six and a half times (Bolivia) more taxes than the poorest 40% of the population.

Table 32 shows the impact of the tax system on income distribution in each of the fifteen EU member states (University of Cambridge [2005]). In comparison with the Andean countries, we should underscore two already perceptible aspects: a higher tax pressure and, particularly, a strong weight, save exceptions, on collection of personal, progressive, and redistributive income tax. Consequently, the tax systems of all these countries are progressive -with the interesting exceptions of Denmark, Finland and Sweden- and show an improved income distribution by 2.5 percentage points of the Gini coefficient as an average for the EU-15, as presented in Table 32.⁴¹

TABLE 32
EU 15 - INCOME DISTRIBUTION BEFORE AND AFTER TAXES - 2001

	Gini Original Income	Gini Income After Taxes	Absolute Variation	Percent Variation	Tax Collection	Personal Income Tax
	(1)	(2)	[(1)-(2)] x 100	[(1)-(2)] / (1)	% of GDP	% of GDP
Germany	0.3868	0.3467	4.0	10.4%	36.9	10.0
Austria	0.3379	0.2944	4.4	12.9%	45.4	10.4
Belgium	0.4188	0.3855	3.3	8.0%	45.8	14.5
Denmark	0.4373	0.4580	-2.1	-4.7%	49.8	26.3
Spain	0.4209	0.3785	4.2	10.1%	35.2	6.9
Finland	0.4437	0.4446	-0.1	-0.2%	46.1	14.1
France	0.3776	0.3568	2.1	5.5%	45.0	8.0
Greece	0.4261	0.3939	3.2	7.6%	36.9	5.4
Holland	0.3480	0.3228	2.5	7.2%	39.5	6.5
Ireland	0.4782	0.4528	2.5	5.3%	29.9	8.9
Italy	0.4275	0.4064	2.1	4.9%	42.0	10.9
Luxembourg	0.3712	0.3234	4.8	12.9%	40.7	7.2
Portugal	0.4442	0.4056	3.9	8.7%	33.5	6.0
United Kingdom	0.4705	0.4610	0.9	2.0%	37.3	11.3
Sweden	0.4066	0.4276	-2.1	-5.2%	51.4	16.4
<i>EU 15</i>	<i>0.4165</i>	<i>0.3920</i>	<i>2.5</i>	<i>5.9%</i>	<i>41.0</i>	<i>10.9</i>

Source: Prepared by the authors based on EUROMOD data.

⁴¹ Two clarifications are necessary regarding the use of EUROMOD data: (1) they are aggregate data, which is why the Gini indexes calculated on their basis are lower than the indexes that could be obtained based on the microdata. In any case, since the aim of the exercise is to compare Gini indexes before and after taxes and public social expenditure, this weakness is not too relevant. (2) EUROMOD's aggregate data are ordered according to *per capita* household disposable income. Therefore, it is not possible to reorder the data of the estimates included in this paper once after-tax income (or after benefits) has been calculated. As a result, its impact is overestimated because the Gini indexes' difference captures not only the pure distributive effect but also the so-called "reordering effect". (Lambert [1989]).

B. Impact of Public Social Expenditure

Public social expenditure -strictly speaking, the items under consideration- has been found to be progressive in Bolivia, Colombia and Peru, the three countries which had the information necessary to carry out an analysis. In addition, public social expenditure in Colombia and Peru is pro-poor; but this is not the case in Bolivia where, as a whole, public spending on health and education⁴² is progressive but, at the same time, pro-rich.

As regards the focus of public social expenditure, the poorest 40% of the population receive between 1.2 (Bolivia) and 3 times more (Colombia) than the richest 10%.

TABLE 33
PUBLIC SOCIAL EXPENDITURE
(Deciles by *per capita* Household Income)

1. Progressivity	Bolivia (1)	Colombia	Peru
<i>Effective PSE/Income Ratio (as a %)</i>			
1st -	154.33	90.41	97.17
2nd -		46.37	39.82
2nd +		3.72	4.27
1st +	5.25	0.87	1.39
Gini Income before PSE	0.556	0.537	0.535
Quasi - Gini PSE	0.153	-0.132	-0.025
Kakwani (if < 0 => progressive; if > 0 => regressive)	-0.403	-0.669	-0.560
2. Redistribution			
Gini Income after taxes	0.511	0.487	0.500
Reynolds-Smolensky (if < 0 => regressive; if > 0 => progressive)	0.045	0.050	0.035
Winners	1 to 4	1 to 7	1 to 7
Gain of 40% -	2.8%	3.0%	2.0%
Loss of 10% +	-4.1%	-3.0%	-2.0%
3. Who Receives the PSE			
40% -	31.1%	49.9%	41.6%
20% +	26.3%	12.0%	18.7%
40% - / 20% +	1.2	4.2	2.2
<i>Memo:</i>			
<i>PSE considered (% of GDP)</i>	8.0	5.5	5.5
<i>PSE (% of GDP)</i>	17.2	8.2	10.1
<i>% of PSE considered</i>	47%	67%	54%

Note: (1) Quintiles.

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Haughton [2005].

⁴² For the reasons mentioned above, pensions were not considered.

In view of the foregoing considerations, public social expenditure has a significantly greater impact on income distribution than the tax system. The higher redistributive capacity of public social expenditure over the tax system is illustrated by the fact that such spending may represent more than 150% of the poorest 10%'s original income, as in the case of Bolivia. On a more global basis, the Gini coefficient after public social expenditure drops between 3.5 percentage points in Peru and 5 percentage points in Colombia. Transfers received by the population's poorest 40% under the public social expenditure policy ranges between 2% of the income after such spending in Peru to 3% in Colombia.

For comparative purposes, Table 34 shows the impact of PSE on income distribution in each of the fifteen EU member countries. The PSE includes expenditures on education, health and social protection (social security and social assistance). The average PSE for these fifteen countries is 24 percentage points of the GDP, more than twice the average PSE in the Andean countries, where it accounts for approximately 11 percentage points of the GDP. Consequently, their redistributive impact is much higher than that estimated for the Andean countries. Indeed, the Gini coefficient of income distribution declines, on the average, almost 9 percentage points after including public social expenditure benefits.

TABLE 34
EU 15 - INCOME DISTRIBUTION BEFORE AND AFTER BENEFITS - 2001

	Gini Original Income	Gini Income after Benefits (a)	Absolute Variation	Percent Variation	2001 PSE
	(1)	(2)	[(1)-(2)] x 100	[(1)-(2)] / (1)	% GDP
Germany	0.3868	0.3055	8.1	21.0%	27.4
Austria	0.3379	0.2695	6.8	20.2%	26.0
Belgium	0.4188	0.3225	9.6	23.0%	27.2
Denmark	0.4373	0.3063	13.1	30.0%	29.2
Spain	0.4209	0.3578	6.3	15.0%	19.6
Finland	0.4437	0.3233	12.0	27.1%	24.8
France	0.3776	0.3016	7.6	20.1%	28.5
Greece	0.4261	0.3620	6.4	15.0%	24.3
Holland	0.3480	0.2705	7.8	22.3%	21.8
Ireland	0.4782	0.3464	13.2	27.6%	13.8
Italy	0.4275	0.3360	9.2	21.4%	24.4
Luxembourg	0.3712	0.2680	10.3	27.8%	20.8
Portugal	0.4442	0.3835	6.1	13.7%	21.1
United Kingdom	0.4705	0.3434	12.7	27.0%	21.8
Sweden	0.4066	0.2940	11.3	27.7%	28.9
<i>EU 15</i>	<i>0.4165</i>	<i>0.3283</i>	<i>8.8</i>	<i>21.2%</i>	<i>24.0</i>

Note: (a) Including net public pensions (pensions - contributions).

Source: Prepared by the authors based on EUROMOD data.

C. Global Impact of the Fiscal Policy

Jointly considered, the tax system and public social expenditure are progressive in Bolivia, Colombia and Peru. At the same time, the fiscal policy's redistributive effect may be said to be modest both with regard to (1) the original issue -poor income distribution- and (2) the redistribution achieved by the developed countries' fiscal policy.

As a matter of fact, as shown in Table 35, the increased share of income going to the poorest 40% ranges from 1.7% in Peru to 3.1% in Colombia. Taking into account that, according to the studies conducted, the share of income that went to the poorest 40% is between 10 times (in Bolivia) and 6 times (in Colombia and Peru) lower than the share of income received by the richest 20% (let us recall Table 3), it seems clear that the fiscal policy's redistributive effect is by no means adequate to the size of the problem.

TABLE 35
TAXES + PSE
(Deciles by Household *per capita* Income)

1. Progressivity	Bolivia	Colombia	Peru
Effective Rate (PSE - Taxes) / Income (as a %)			
1st -	129.99	77.52	60.89
2nd -		35.91	23.78
2nd +		-2.95	-4.55
1st +	-8.81	-7.82	-7.69
2. Redistribution			
Gini Income before Fiscal Policy	0.556	0.537	0.535
Gini Income after Taxes	0.567	0.537	0.543
Gini Income after PSE	0.511	0.487	0.500
Gini Income after Fiscal Policy	0.513	0.483	0.504
Reynolds-Smolensky (if < 0 => regressive; if > 0 => progressive)	0.043	0.054	0.031
Losers	5	8 to 10	8 to 10
Gain of 40% -	2.8%	3.1%	1.7%
Loss of 10% +	-3.8%	-3.5%	2.0%

Source: Prepared by the authors based on Cossio [2005]; Zapata and Ariza [2005]; Haughton [2005].

Furthermore, Table 35 also shows that the Gini coefficient of income distribution after fiscal policy drops between 3 (Peru) and 5.4 percentage points (Colombia).

Table 36 presents the joint effect of the tax system and public social expenditure in each of the EU-15 member countries. In all of them, the joint effect of the tax system and public social expenditure -both, as already explained, with a greater GDP share than the Andean countries- push the Gini coefficient down by more than 12 percentage points, two and a half times more than the estimate for these three Andean countries.

Nevertheless, the possibilities that the fiscal policy can bring should be given their proper weight without demanding from it more than it can provide in terms of redistribution. For instance, if collection of the income tax levied on individuals (*Impuesto a la Renta de Personas Físicas* - IRPF) increases by 1% of the GDP in Colombia and that additional collection is used to fund an equivalent increase of public social expenditure with the best and identical targeting strategies than the health subsidized scheme, the following would be obtained:

- a) A 10% increase in the share of income of the poorest 40% (from 10.2% to 11.3); and
- b) A 25% increase in the share of income of the poorest 10% (from 1.2% to 1.5%).

TABLE 36
EU 15 - DISTRIBUTION OF INCOME BEFORE AND AFTER TAX - 2001

	Gini Original Income	Gini Income after Fiscal Policy	Absolute Variation	Percent Variation
	(1)	(2)	[(1)-(2)] x 100	[(1)-(2)] / (1)
Germany	0.3868	0.2538	13.3	34.4%
Austria	0.3379	0.2230	11.5	34.0%
Belgium	0.4188	0.2627	15.6	37.3%
Denmark	0.4373	0.2568	18.1	41.3%
Spain	0.4209	0.3128	10.8	25.7%
Finland	0.4437	0.2848	15.9	35.8%
France	0.3776	0.2777	10.0	26.5%
Greece	0.4261	0.3269	9.9	23.3%
Holland	0.3480	0.2347	11.3	32.6%
Ireland	0.4782	0.3038	17.4	36.5%
Italy	0.4275	0.3369	9.1	21.2%
Luxembourg	0.3712	0.2142	15.7	42.3%
Portugal	0.4442	0.3425	10.2	22.9%
United Kingdom	0.4705	0.3086	16.2	34.4%
Sweden	0.4066	0.2613	14.5	35.7%
<i>EU 15</i>	<i>0.4165</i>	<i>0.2913</i>	<i>12.5</i>	<i>30.1%</i>

Source: Prepared by the authors based on EUROMOD data.

VI. CONCLUSIONS

International integration gives rise to trade specialization, with its major implications upon technological progress, labor markets and structure of ownership, all of which affect income distribution and its evolution. Conceptually, a considerable part of Latin American inequality is associated with the role of the region in international trade. Since it is a commodity-producing region (mainly extraction of non-renewable natural resources) that has been de-industrialized, it tends to have an income-concentration pattern.

Considering taxes and social spending on a joint basis, the fiscal policy had a positive, but insufficient redistributive effect in the Andean countries, and there is opportunity for significant improvement in that area. This may be achieved by increasing the total tax burden -actual taxes paid are lower than potential tax collection-, improving personal income tax collection -which has a strong redistributive potential- and targeting public spending more efficiently to the poorest, in view of the high poverty levels (50%).

The full effect of taxes on income distribution is slightly regressive for the three countries reviewed. In international comparative terms, this is due to a weak capacity for income tax collection.

The value added tax (VAT), the pillar of revenue collection in the developing world, has a very low productivity in the Andean countries because of its design and administration, and a modest impact on vertical equity. Even though income is considered as an indicator of welfare, VAT is moderately regressive in Bolivia and Colombia and somewhat more highly regressive in Peru (where exemptions seem to be improperly designed), while it is slightly progressive in Ecuador and Venezuela.

Moreover, considering that the taxes paid by the richest 20% are several times more than the taxes paid by the poorest 40% -in on average, more than three times- it seems clear that they should be made generally applicable (thus streamlining its their administration) and target increased collection to reducing extreme poverty levels (20%), as provided for by Decision N° 599 of the Community of Andean Nations.⁴³

Excise taxes have a very limited redistributive capacity. Taxes levied on alcoholic and non-alcoholic beverages, as well as on tobacco, tend to have an almost neutral effect on vertical equity. This indicates that redistributive policies based on excise, including luxury taxes, are unfeasible, even before considering the smuggling and informality resulting from increasing the tax pressure on such goods.

As regards taxes on fuels, if, in addition to estimating the direct impact of fuel consumption (progressive), its indirect impact on household consumption is also considered (regressive: public transportation, fuel consumption at home, etc.), the resulting net effect is significantly regressive. On the other side of the coin, the subsidy of gasoline is regressive, in addition to fiscally expensive. The balance between using the tax as a service charge for using non-toll roads or as a

⁴³ Andean Decision 599, "Harmonization of Substantial and Procedural Aspects of Value Added Type of Taxes".

production input and vertical equity requires a study of innovative technological and administrative solutions in view of the adjustment of crude prices.

Personal income tax, almost the only tax instrument having a redistributive capacity worldwide, is both progressive and neutral -from an income redistribution point of view- due to its low tax collection rates (on average, less than 1% of the GDP). Even though Latin America as a whole lacks an efficient income tax collection system, in countries with a relatively higher *per capita* income (Argentina, Brazil, Chile, Mexico or Uruguay) income tax collection more than doubles that of the other countries. Even countries with a *per capita* income higher than those -for instance, the new members of the European Union and some countries in Asia and the north of Africa- collect in excess of five times more. In view of this, it has become clear that a comprehensive, integral income tax design (and cellular systems in all their variations) has generally failed in Latin America and, as a result, new methods, such as the dual and linear methods of income tax (including its corporate and international components) should be considered. Moreover, since the current tax system of the countries in this region determines that the after-tax share of income of the richest 10% is greater than their share of income before taxes, it seems obvious that personal income tax should contribute to solving this issue.

The accumulated public social expenditure has a much higher redistributive effect than taxes. This is reflected by a correction of the Gini coefficient of more than 5 percentage points, close to half the effect of developed economies (OECD [2004a]).

Spending on education in the three Andean countries under review is progressive and pro-poor at the primary and secondary levels; university education, though progressive, is pro-rich. The ratio of public university attendance is 5:1 in favor of the richer part of the population, except for Peru, where it is 2.5:1. Moreover, the cost per university student is five times higher than the cost per primary student. There is a pressing need, therefore, to study the effects of university education at the point of entry into, and the possible externalities of, higher education, to define its funding policy. In short, more spending on basic education will have a twofold effect: to improve labor competitiveness and to favor vertical equity, preventing poor quality education from becoming a trap that blocks social mobility.

Spending on health is quite progressive in the three countries where there was information available for the analysis, but it is pro-poor only under the Colombian subsidized system, which shows that there is administrative capacity to properly target such spending.

As regards pension systems, they do not have a major redistributive role, particularly after the reforms enforced in four of the five countries (save Venezuela), which introduced an actuarial component into the system. However, it should be noted that actuarial systems, privatized or otherwise, do not usually solve the minimum pension adequacy and coverage issues. That is why they represent a risk for long term fiscal sustainability, and if the system coverage level and/or replacement rate is/are very low, the States will be forced to supplement the benefits granted by the system.

If the ratio between the targeted social spending received by the poorest 40% and the richest 20% is considered as a rough measurement, social subsidies in Peru -where information on all items is available- have a better targeting than the remaining items of its public social expenditure. This ratio is 1.8 for health, 3.3 for basic education, 0.4 for university education and 5.6 for social

subsidies. With the high levels of poverty and extreme poverty found in the Andean countries, targeted spending has broad possibilities, since emergency assistance is key for social cohesion. However, it should be recalled that targeted expenditure has a limitation as to amount (goods and services, and sums granted), and that above that ceiling it generates perverse incentives.

Finally, it should be emphasized that the aim of the studies contained in this book is to initiate a benchmarking exercise as a means of evaluating some of the policies that have been applied and the changes in each country over time. In addition, this effort of studying fiscal equity, concerning both income and tax expenditure, makes it necessary to improve the analytical data and methodology, placing special stress on measuring the effectiveness of public social expenditure.

ANNEX I - STATIC SIMULATIONS WITH NO BEHAVIOR RESPONSE

The simulations carried out in the different works are static, meaning that they are based on a cross-section of data that maintain their demographic and socioeconomic characteristics constant over time. Dynamic simulations, on the other hand, take into account the effects of time, by submitting the samples for analysis to an aging process conducted year after year, from the time they are born until the time of death, in order to simulate the full life cycle of each and every one of them. (Sanz Sanz [2004]).

Furthermore, the various studies do not include an analysis of the economic agents' behavior faced with a tax reform, that is they do not estimate or consider their reaction functions. To do that would require, first, to estimate, and then, to include in the simulation the price-elasticity of the demand for goods and services, crossed elasticities and the expenditure elasticity.⁴⁴

Since that procedure has not been followed, there are two options to make this estimation when one wishes to analyze, for instance, the introduction of a tax:

- 1) assuming that, once the tax has been introduced, the economic agents' expenses are increased by the same percentage by which the price of goods and services has increased or, on the contrary,
- 2) assuming that the expenses of the consumers have remained constant, that is to say, that the introduction of the tax, which translates into a lower amount of income available for the taxpayers, results in a reduction of actual consumption.

If the goods and/or services that become taxed are mainly used by the higher income sector, it would not be unreasonable to assume that the introduction of the tax does not result in a reduction of actual consumption. The opposite should be assumed if the tax applies to goods and/or services basically used by lower income households. Please note that, in the end, the discussion is whether the price elasticity of the demand is -1 (if total spending is assumed to remain constant) or 0 (in the event that we assume that the monetary expenses increase by the same percentage affecting the price of the goods or services no longer tax exempted).

In these works it has been assumed that, after introducing the taxes considered in the analysis, the monetary expenses of the economic agents in the various goods and/or services remain constant, so that the "actual" (untaxed) expenses decrease. The premise is that the consumer's budget restriction is maintained and the expenses are reallocated without considering the impact of the change in relative prices (the effect of substitution is not captured). This assumption only seeks to simplify micro-simulation.

Even within the framework of micro-simulation models with behavior, it is assumed that production prices do not change as a result of tax reforms, but the final prices for consumption do. This implies the assumption that, concerning its economic impact, VAT is passed on to the end consumer. Most of the studies also adopt this assumption.

⁴⁴ Before that, it is necessary to estimate the elasticity of supply or, as usual, assume that it is infinite (the producer passes the full tax on to the price).

ANNEX II - CHOICE OF THE WELFARE INDICATOR: INCOME *VERSUS* SPENDING

There was, and there still is, discussion in the economic literature as to whether it is best to consider either income or expenditure as a reference variable to measure the impact of the tax system, particularly VAT, on equity. The heart of the matter is which of these two variables is the best welfare indicator.

Traditionally, the option preferred was current income and, even though more recently it has become popular to believe that the relevant inequality is the inequality of opportunities, income has survived as a reference indicator due to the fact that it is considered as a very good proxy of the opportunities given to an individual. Lately, though, the scale has apparently begun to tilt in the direction of consumption, not only because welfare is said to be an immediate and direct result of the goods and services consumed, but also because the choice of income has been subject to a number of criticisms, namely:

1) It has been empirically proved that income is underreported in household surveys. Some studies which analyzed this underreporting by source of income relate it to self-employment, the income of professionals and capital income (the latter may determine a different degree of underreporting based on income bracket, since capital income is received by the richest households). On the contrary this high degree of underreporting is not found in consumption.

2) Its transitory nature. Collection of (or failure to collect) a certain income is sometimes provisional and, therefore, using that amount of income to measure the impact of VAT -which taxes consumption- may lead to the wrong results. For instance, if a pensioner reaches a high level of consumption by financing it with the dissavings typical of this stage in his or her life cycle, the burden of VAT on his or her savings will be very high but, at the same time, will provide little information. Likewise, if a certain household gets an unexpected windfall in the year the survey is conducted, the burden of VAT on such income will be very low, but will also provide little information since this income will be used in the following periods.

To solve the problem created by transitory income collection, some authors proposed considering the permanent (and not the current) income as a reference indicator. Given the difficulty to calculate it, the next step was to suggest consumption as the best proxy for permanent income.

Here, we would like to make the following comment: household income includes monetary transfers from the government, as part of the public social expenditure policy (for instance, Ecuador's Human Development Bond). These items should be deducted so that the income taken into account to determine initial distribution may be actual income prior to any fiscal action. However, no such adjustment was made in this work. In any case, even if it had been made, the income prior to fiscal action indicated in the household surveys is potentially affected by fiscal policy (Gasparini [1999]). As Gasparini very well notes, employer contributions to Social Security may reduce the salaries shown by the surveys. Such potential effects are not taken into account either.

Finally, correcting spending on this basis would imply the arbitrary determination of the goods and services consumed due to government transfers which, in their absence, would not have been consumed.

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