



**Putting Pressure: estimating the real fiscal burden
in Latin America and the Caribbean.
Concept, Development and International Comparisons**

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Abstract

This study analyzes the performance of fiscal revenues in Latin America and the Caribbean (LAC) between 1990 and 2010. The analysis was carried out using a database created by the IDB and CIAT, and applying the definition of Equivalent Fiscal Pressure (EFP). The latter comprises tax revenues administered by the central government and subnational governments, income from the exploitation of natural resources, and all mandatory contributions that finance the social security system. The study later examines EFP convergence between the countries of LAC and the Organization for Economic Cooperation and Development (OECD), offers a historical comparison between countries' development and the scale of their fiscal resources, and provides an econometric analysis of the fiscal effort, which also confirms the progress made as well as the remaining challenges.

Accepting the diversity of the Equivalent Fiscal Pressure's structure in the countries analyzed, we can affirm that its panorama has changed over the last twenty years. The main increases in revenue were observed in tax systems administered by the central government and were due to taxation reforms mainly implemented since the mid-90s. In the future, the modernization of the tax system should continue to reconcile the necessities of fiscal management with the economic system's demand for equity and efficiency.

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1. Introduction¹

Until the early 1990s, international comparisons highlighted the inadequacy of tax revenue in the countries of Latin America and, to a lesser extent, the Caribbean. Limited state revenues were ascribed to the fact that “here, nobody pays their taxes,” a phrase that was repeated mechanically until recently.

As is often the case, the reality is more complicated—firstly, because that reality has changed. Today, the citizens of most Latin American and Caribbean (LAC) countries pay more taxes than 20 years ago, and in several cases their tax obligations are proportional to those of their counterparts in developed countries. Secondly, if an international analysis of fiscal revenues is to make sense, it has to consider the heterogeneity of countries’ income sources and institutional arrangements. Otherwise we would be comparing things that are not really comparable. In this regard it is widely known that significant revenues are derived from the exploitation of natural resources in most LAC jurisdictions, in other emerging countries, and indeed in Norway. In LAC, moreover, private and public arrangements to finance social security coexist, a circumstance that is not properly reflected in international definitions.

An international comparison of fiscal receipts requires that three elements be added together: tax revenues, income from the exploitation of natural resources, and all the contributions that go toward financing the social security system.² The sum of these three gives what we call the Equivalent Fiscal Pressure (EFP). This is the relevant fiscal-revenue indicator for LAC, both from the perspective of the resources available to the state and from the viewpoint of the effort demanded of citizens.

When considering these three elements, one must re-examine the validity of the total tax evasion myth and put international comparisons in relative terms. The starting point was to build a Fiscal Revenue Database that includes the *relevant* income streams for LAC countries. This undertaking was shared by a joint team from the Inter-American Center of Tax Administrations (CIAT) and the Inter-American Development Bank (IDB).

This study has five sections, including this introduction. The second section analyses the evolution of the EFP during the last two decades. Natural resources, social security and the EFP’s primary tax-based components are also considered in the section, which involves twenty-one of the LAC countries. The third section centers on EFP convergence between LAC countries and those of the Organization for Economic Cooperation and Development (OECD). That section also offers a historical comparison between the countries’ development and the scale of

¹ The authors are grateful for the valuable statistical, graphical and editing assistance of Agnes Rojas and Amanda Mitchell’s help on these tasks. They are also thankful for comments on a preliminary version of this study made by Daniel Artana, José Salim and the participants at the Workshop on Tax Statistics and the III LAC Forum (Barreix et al., 2013b) in July 2013 in Montevideo.

² A fourth financing source remains to be included: resources generated by the monetary authority. In recent years this source has regained importance in some countries of the region.

their fiscal resources. Further, it provides an econometric analysis of the fiscal effort, which further confirms the progress made. The fourth section centers on a methodological and legal analysis of EFP. The conclusions end the study.

As seen in this paper, an EFP increase is observed in each of the countries studied. In most cases, the chief revenue increases were observed in tax systems managed by the central administration. This was possible as a result of tax reforms undertaken by the countries themselves, the reformulation of development strategy and the advancement of favorable terms of trade with developed countries during the last decade. Nevertheless, in nominal terms differences with developed countries persist, due to lower per capita GDPs in the region as compared to the average per capita GDP in the OECD.

Looking toward the future, the tax system's modernization must continue to make the necessities of fiscal management compatible with the economic system's demands for equity and efficiency. At the same time, a return to the low EFP levels of the past is not anticipated because political systems in the region have internalized that the EFP contributes to better macroeconomic management of their countries and also betters their ability to meet growing citizen demands.

Finally, we should point out that this study does not seek to assess the optimum level of the EFP or the quality of its composition, but rather to propose a methodology that allows us to quantify the true fiscal pressure in LAC, how it has developed, and how it compares internationally.

2. The Equivalent Fiscal Pressure in Latin America and the Caribbean

2.1 Estimation and Evolution

LAC countries' fiscal revenues grew significantly between 1990 and 2010³ as a result of several factors, chiefly the reform of tax policy and administration, and better terms of trade for their main export products over the last decade. On average, the EFP increased by 32.8 percent between 1990 and 2010, which for the region' tax authorities meant an average 5.4 additional percentage points of GDP.⁴ The increase in resources altered the fiscal landscape that had prevailed up to the 1990s, marked by recurrent imbalances in public finances.

Bolivia, with an almost 90 percent EFP increase, is the regional leader of increases in this variable between 1990 and 2010. Following closely behind are three other countries: Colombia, Argentina, and Ecuador, which registered gains around 70 percent in this period. These increases

³ In Latin America and the Caribbean, after the 1990s, the development strategy gave a larger role to the market in allocating resources, to economic openness as a growth driver and to the private sector, including foreign investors, in the provision of goods and services. Under this system, government role revolved around regulation activities that would spur adequate market functioning, including the provision of basic social and collective services, such as justice, health, education and security.

⁴ Though the text refers to specific years, the data in Figure 1 and in Section 4 are based on multiannual averages. This allows us to smooth out the effects of particular values that are not representative.

represent resource growth for the treasuries of Argentina, Bolivia, Colombia and Ecuador accounting for 9 to 13 percent of the GDP in barely twenty years. El Salvador, the Dominican Republic and Guatemala registered EFP increases located in the 40 to 45 percent interval in the period analyzed, albeit starting from very low values. A third group also presented significant increases, in the range of 15 to 30 percent. While these values are lower, for the most part this occurred in the cases in which the point of departure was relatively higher (for example: Brazil, Belize, Costa Rica, Trinidad and Tobago and Uruguay). Notably, single digit PFE increases were only observed in Chile, Mexico and Panama. Even in these cases, however, the values were relatively high, between 8 and 9 percent.

Chart 1						
Evolution of the Equivalent Fiscal Pressure (% of GDP)						
	1990/	1995/	2000/	2005/	2005/10 vs 1990/94	
	1994	1999	2004	2010	Var. Percent.	Var. %
					Points	
Argentina	18.56	22.79	24.31	31.52	13	69.80%
Barbados	27.75	30.13	34.67	33.19	5.4	19.60%
Belice	21.7	20.5	21.67	25.65	4	18.20%
Bolivia	14.95	18.67	21.1	28.27	13.3	89.10%
Brasil	26.88	27.4	31.51	33.91	7	26.10%
Chile	25.88	24.94	24.8	28.12	2.2	8.60%
Colombia	13.62	17.33	18.63	23.19	9.6	70.30%
Costa Rica	17.14	17.23	18.67	21.5	4.4	25.40%
Ecuador	12.72	13.7	18.06	21.57	8.8	69.50%
El Salvador	11.97	13.82	15.69	17.4	5.4	45.40%
Guatemala	9.26	10.14	12.85	13.04	3.8	40.90%
Honduras	16.54	17.69	17.06	19.01	2.5	14.90%
Jamaica	20.75	22.78	22.74	23.74	3	14.40%
Mexico	18.45	17.67	18.8	20.17	1.7	9.30%
Nicaragua	16.39	13.04	15.42	19.36	3	18.10%
Panama	19.12	18.97	17.73	20.61	1.5	7.80%
Paraguay	15.08	17.79	18.52	19.52	4.4	29.40%
Peru	14.8	17.06	15.69	18.06	3.3	22.00%
Dominican Rep.	10.17	11.4	12.88	14.47	4.3	42.30%
Trinidad & Tobago	26.14	23.8	29.18	32.05	5.9	22.60%
Uruguay	24.07	26.23	30.97	30.25	6.2	25.70%

Source: Authors' own calculations based on IDB/CIAT Database.

The rise in the EFP is notable not only for its magnitude but also for its persistence. Although the revenue increases originally stemmed from adjustment measures introduced to restore fiscal balance, for most of the last decade the EFP endured and continued its rising trend, allowing governments to maintain those balances and in some cases to increase spending. Revenue increased in large part because the political class grasped the importance of having fiscal resources that were high and robust over time, so as to avert the erosion of the democratic system's governability wrought by successive rounds of macroeconomic adjustment.

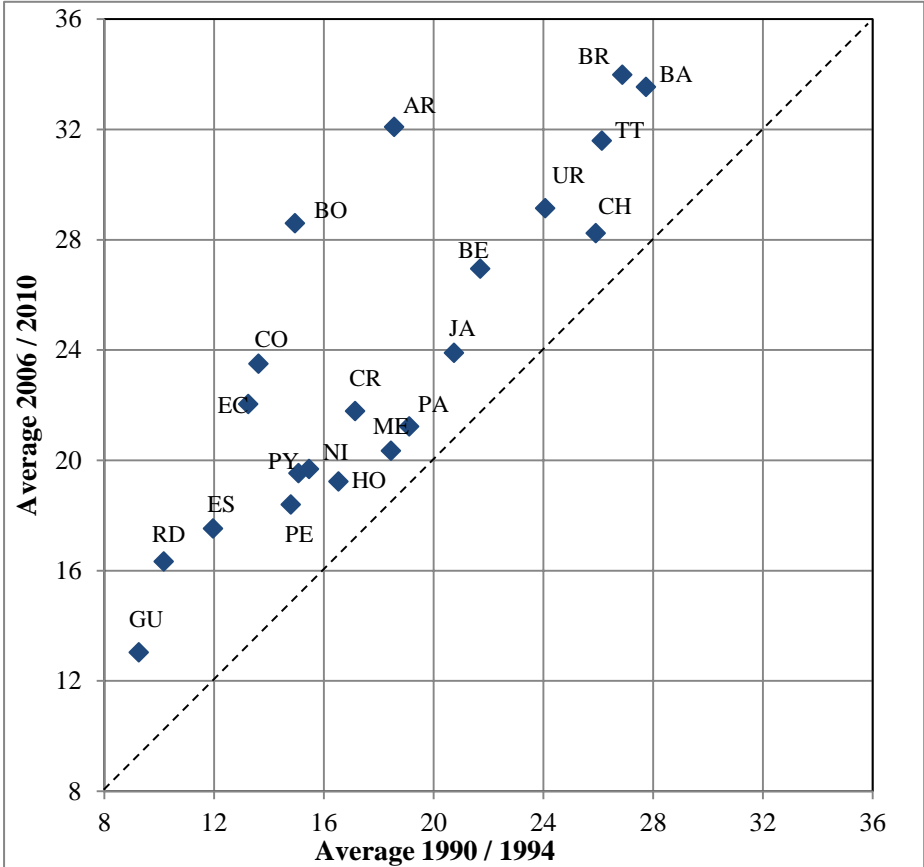
Figure 1 illustrates the change in EFP between the beginning and end of the period of analysis for the countries examined here. Along the 45-degree dotted line, the values on the y axis are equal to those on the x axis. By contrast, when the values are to the left of the dotted line we see that the observations of the 2006–2010 period, measured on the y axis, are higher than those for the 1990–1994 period, measured on the x axis. The vertical distance between the observed value and the 45-degree line indicates by how many percentage points of GDP the EFP has increased. The values observed for all countries are to the left of the 45-degree dotted line. The biggest increases are for Argentina, Bolivia and Colombia, while Chile, Mexico, Panama and Peru are the shortest distance from the dotted line.

In most of the countries analyzed, the increase stemmed mainly from tax revenues, especially from taxes administered by the central government. This increase was an explicit policy and administrative objective of these taxation system reforms, contrasting with the results of reforms that established neutral objectives in terms of revenue collection.

Mexico, Panama, and Trinidad and Tobago are exceptions in this regard. In these three countries the tax burden in GDP terms was lower at the end of the period than in 1990, though this was offset by the higher revenues derived from the exploitation of natural resources. While natural resources are important in all the LAC economies, these three countries and Paraguay are those in which the income from such resources accounts for a higher share of the EFP. Though it is reasonable for a country to exploit its natural resources, it is true that the non-renewable nature of the resources in Mexico and Trinidad and Tobago, as well as the projections of declining hydrocarbons production in both countries over the medium term, oblige them to think of more sustainable sources of government financing.

By contrast, in most of the remaining cases not only was there an increase in tax revenue collection, but this was also the main factor in EFP growth, accounting for between 60 to 95 percent of the increase depending on the case. Bolivia and Colombia were the only important exceptions, since in their case the most significant income was derived from the exploitation of natural resources and, to a lesser extent, revenues from the welfare system, explaining a large part of the EFP increase. In any event, even in the case of these two countries, taxation increase accounts for between 47 to 49 percent of the EFP increase.

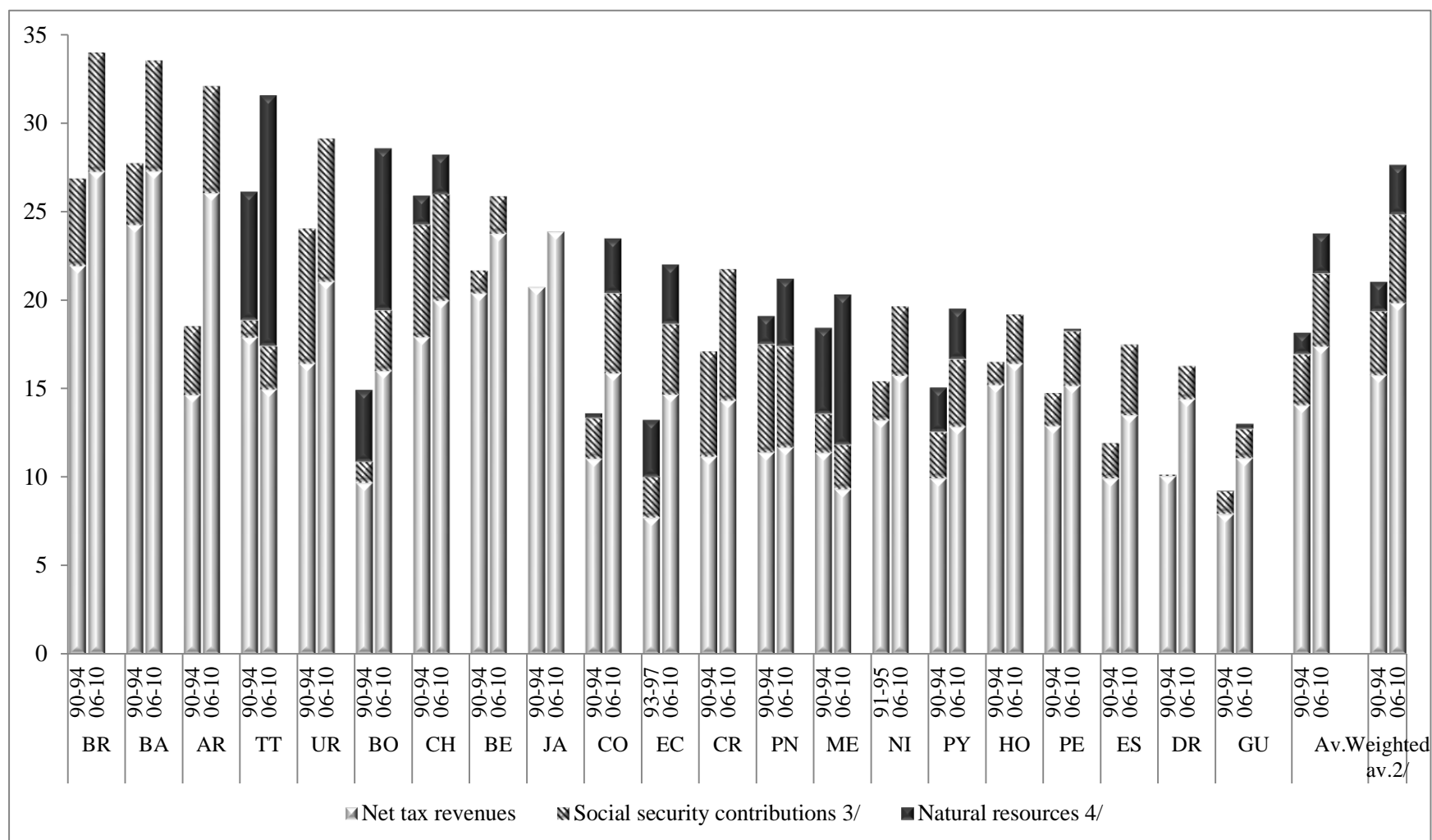
Figure 1. Comparison of EFP growth in LAC countries ¹²(% of GDP)



Source: IDB-CIAT (2012)

1. For Ecuador and Nicaragua, information from 1993 and 1991 onwards, respectively.
2. Nicaragua’s EFP levels fell substantially (six points in 2010) after the country’s central bank updated the methodology used to calculate GDP, which increased current output by almost 30%.

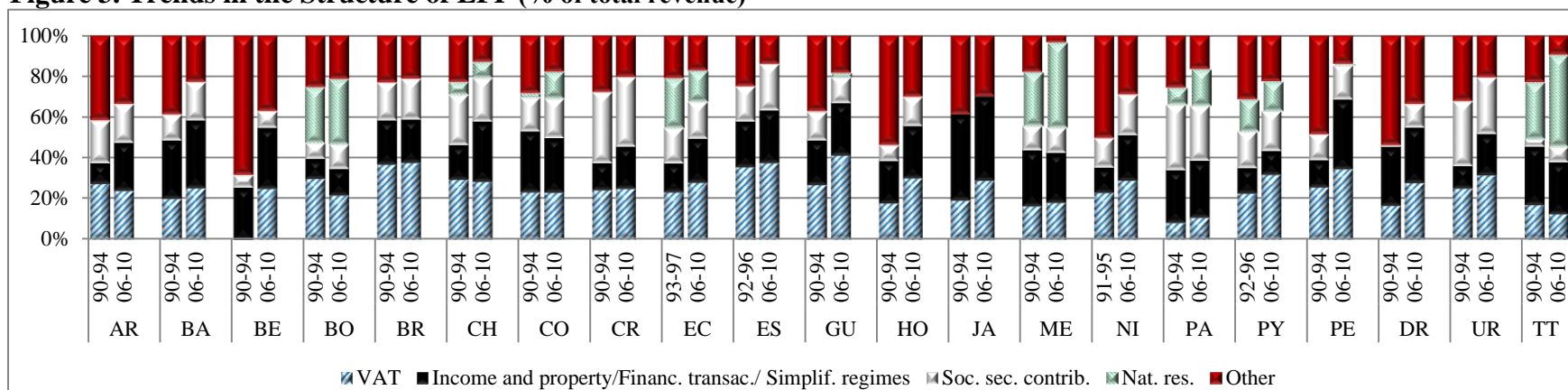
Figure 2. Latin America and the Caribbean: Equivalent Fiscal Pressure (% of GDP)^{1/}



Source: IDB-CIAT (2012).

1/ For Ecuador and Nicaragua, information on fiscal pressure is available from 1993 and 1991 onwards, respectively. 2/ Average weighted by the GDP in current dollars of each country. 3/ Contributions to social security include compulsory, public and private pensions and healthcare systems. 4/ Net revenue from the exploitation of natural resources.

Figure 3. Trends in the Structure of EFP (% of total revenue)^{1/}

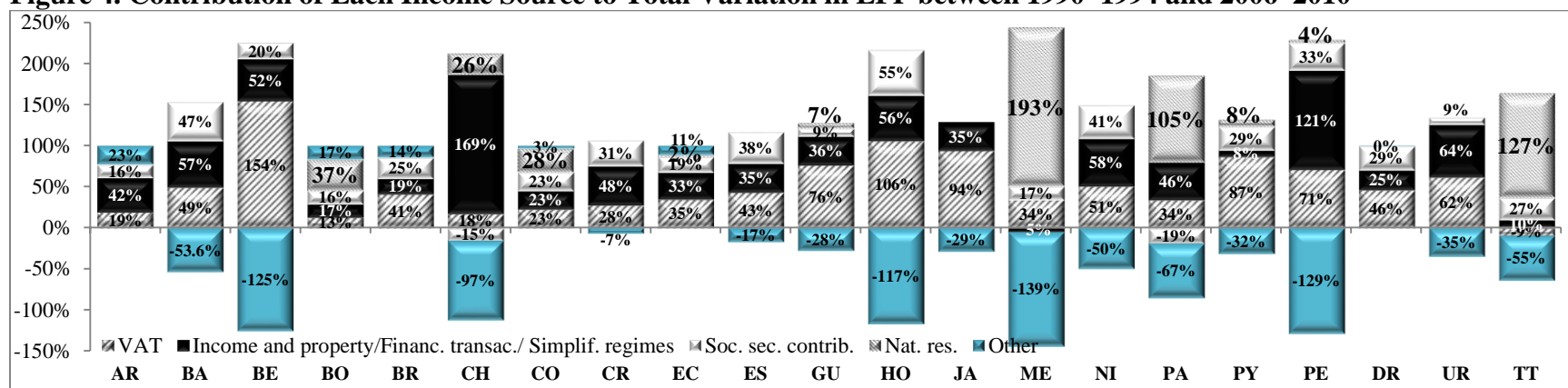


Source: IDB-CIAT (2012).

1/ For Ecuador and Nicaragua, information is available from 1993 and 1991 onwards, respectively. For El Salvador and Paraguay, VAT data is available for the years 1992–1996.

EFP (% GDP)	AR	BA	BE	BO	BR	CH	CO	CR	EC	ES	GU	HO	JA	ME	NI	PA	PY	PE	DR	UR	TT
90-94	18.6	27.8	21.7	14.9	26.9	25.9	13.6	17.1	13.3	12.9	9.3	16.5	20.8	18.5	15.5	19.1	16.8	14.8	10.2	24.1	26.1
06-10	32.1	33.5	25.9	28.6	34.0	28.2	23.5	21.8	22.0	17.5	13.0	19.2	23.9	20.3	19.7	21.2	19.5	18.4	16.3	29.1	31.6
Dif. 90-94/ 06-10 (pp)	13.5	5.8	4.2	13.6	7.1	2.3	9.9	4.6	8.8	4.6	3.8	2.7	3.1	1.9	4.2	2.1	2.8	3.6	6.2	5.1	5.5
Dif. 90-94/ 06-10 (%)	73%	21%	19%	91%	26%	9%	73%	27%	66%	35%	41%	16%	15%	10%	27%	11%	16%	24%	61%	21%	21%

Figure 4. Contribution of Each Income Source to Total Variation in EFP between 1990–1994 and 2006–2010^{1/}



Source: IDB-CIAT (2012).

1/ Calculation of the percentage-point variation (GDP terms) of total EFP and each income source. Then, the share of the variation of each source was calculated as a percentage of the total variation in EFP.

2.2 The Development of Direct Taxes

For analysis purposes this paper considers direct taxes to be a combination of income taxes and simplified tax regimes with property taxes managed by both the central and subnational governments.⁵ The most important property taxes are those on assets and/or net wealth, which have been disappearing from many tax systems in the region. Also diminishing are taxes levied on financial transactions, according to OECD criteria on this subject.⁶

Measured in terms of their GDPs, Barbados, Jamaica, Chile and Trinidad and Tobago lead the region in terms of income and property taxation. Nevertheless, beyond this likeness, tax income collection between the countries differs. In Chile's case three out of four *pesos* collected came from businesses⁷ during the 1990-2010 period. This contrasts with what occurred in the Caribbean nations, where between 54 and 55 percent of the income tax was paid by individuals and the rest by firms.

The second notable fact is that Belize, Brazil, Colombia, Mexico and Panama maintained the tradition of a robust income tax collection during the two decades analyzed. Excepting Mexico, where there was a slight drop in revenue as a share of the GDP between 1990 and 2010, the other four countries showed increases between 0,75 and 2,12 GDP percentage points.

Finally, some of the countries with the lowest collection of these taxes at the beginning of the period showed substantial increases in the amount collected by the end. In Argentina's case, improvements in tax design and administration, lagging inflation adjustment for both individuals and legal entities, and the contributions of the financial transactions tax explain this positive evolution.⁸

In Costa Rica the income tax increase and, to a much lesser extent, the behavior of property taxes, are responsible for the tax collection increase within the direct taxes group in this period. With respect to the breakdown of this increase by type of taxpayer, while in absolute terms businesses made the largest payments, in relative terms individual taxpayers most contributed to the increase. In Ecuador and Peru, similar to growth resulting from their general tax system reform, important advances were also observed in this category.

Meanwhile, at the conceptual level, the most important income tax reform was introduced by Uruguay in 2006.⁹ Its distinctive element was the dual treatment of revenue derived from wages and

⁵ The simplified systems generally cover the tax obligations of those persons with incomes less than the amount specified by the tax administration.

⁶ An element of arbitrariness exists in any tax classification system. In particular, some of our commentators have questioned our adoption of the OECD standard including foreign transaction taxes within the overarching group of direct taxes. They have also questioned that we did not include export taxes in the direct taxes category. It must be highlighted that the classification system adopted does not invalidate the present work's general conclusions.

⁷ CODELCO, the state copper business, contributed 22% of all Chilean income tax collection between 1990 and 2010. This represents 2/3 of individual contributions.

⁸ Despite the fact that income from the financial transactions tax is important, accounting for almost 28% of the collection increase in this category during the period of analysis, income tax contributes more, accounting for two out of every three *pesos* of the collection increase.

⁹ See Barreix and Roca (2007) for a description of semi-dual income tax reform in Uruguay.

financial income, which allowed the collection of individual tax contributions to rise 1.5 GDP percentage points between 2006 and 2008. Various Central American countries, Peru and the Dominican Republic incorporated Uruguayan reform elements into their tax systems in recent years, which should reflect increases in income tax collection in the coming years.

Even with the advances cited, on an international scale the collection of income tax is still low in terms of individual contributions, around 2% to 3% of the GDP. This burden represents between 20 and 30 percent of the average value in OECD countries, or approximately half of the tax burden observed in countries such as Spain and Portugal. In LAC countries the two upper deciles are likely to receive between 45 to 65 percent of income while 40 percent of the population does not receive more than 15 percent. This high revenue concentration confirms the necessity of significantly increasing tax collection.

2.3 The Development of the Value Added, Excise and Foreign Trade Taxes

Tax reform sought the rationalization and simplification of the tax system with the objective of increasing collection and facilitating administration.¹⁰ In indirect taxation this required the elimination of most excise taxes and the reduction of tariffs on foreign trade substituted by the VAT, a tax with a wide base that was more easily administered with a relatively uniform rate. This subsection will examine the evolution of these three taxes, beginning with the VAT.

Brazil introduced the VAT in 1967, becoming one of the first countries in the world to adopt the tax, which in the course of the next few decades would become one of the pillars of the modern tax system. The Brazilian initiative was replicated in the countries of the region, paving the way for the reform of indirect taxes. One of the differences between the application of the tax in Brazil and in the rest of the continent was that in Brazil VAT authority was allocated to sub-national governments, while in the rest of the countries it was a power of the central government.¹¹ This introduced more than a few challenges in administrating this tax, although it provided Brazilian states and municipalities with a significant income source—the most important source of its peers in the region.¹²

Unlike the income tax situation, VAT collection in the region is high in international terms. Brazil is the leader of VAT collection in the region. If taxes administered by the States and Municipalities are added to those levied by the Federal Government that show characteristics of a value added tax, Brazil collects almost 13 GDP points from VAT taxes. One step below Brazil are Uruguay, Barbados, Chile, Bolivia and Argentina with VAT collections around 5 to 9 percent of their respective GDPs.

¹⁰ See Bes (2013) for a description of the tax reforms adopted by LAC countries.

¹¹ Germany and Canada are other examples of nations in which the sub-national role is of primary importance. In Germany, the intermediate level (*Länder*) is responsible for VAT administration, which co-participates with the federal government in levying the tax. In Canada, the VAT is levied by the federal government. The *Canada Revenue Agency*, administers the tax everywhere except Quebec, where the local tax administration provides the service.

¹² Rezende (2012) analyzes the sub-national VAT's challenges in Brazil and presents a proposal to overcome them.

High VAT collection has consolidated over the last twenty years in the majority of countries analyzed without significant disagreements with respect to its reformulation, excepting the need to review the Brazilian system, as previously discussed, and the debate recently raised in Mexico. In effect, the VAT has not acquired a significant role in Mexico, due to the fact that distribution concerns dominated tax debates. Nevertheless, in recent years parliamentary and academic discussions regarding the generalization of the tax base and rate increases must be complemented with additional measures to provide relief for low-income families.¹³

If the VAT was one manifestation of the search for neutrality and the need to simplify the tax system, the other was the streamlining of excise taxes. The result of this was a system that taxed a relatively small set of goods with negative externalities in terms of health (alcoholic beverages, carbonated beverages and tobacco products); as well as transport vehicles, auto parts and fuels.¹⁴

One distinctive feature of Colombia is that it has allocated these taxes to the subnational level under the fiscal monopoly considerations mentioned in the fourth section of the present work, which describes OECD criteria. The resource base is relatively narrow, above all in terms of the taxes on alcohol and tobacco, which require significant tax design harmonization in order to avoid smuggling activities between subnational jurisdictions.

Moreover, the Colombian experience with surcharges on gasoline seems to have had favorable results and could be imitated for the purpose of reducing vertical gaps in the financing of subnational governments.

The epidemiological transition evident in most countries in the region where chronic illnesses have become a growing public health challenge suggests that these taxes will have an increasingly important role in the future. Nevertheless, although the tax discourages the consumption of certain goods considered harmful to health, the collection of excise taxes will hardly exceed more than 3 to 4 percent of the GDP.¹⁵

Similar to the evolution of excise taxes, taxes on foreign trade were also downsized. In this case, tariff levels and scales were reduced, simultaneously eliminating quantitative restrictions affecting international trade. The result was a significant change in relative prices in favor of tradable products, consequently impacting the allocation of resources of the economies involved.

Most countries eliminated export taxes. However, as previously mentioned, Argentina re-introduced these taxes when they abandoned the monetary convertibility system. The resulting large devaluation increased tradable products prices, which in Argentina's case are mainly agricultural. Consequently,

¹³ Antón, A., Hernández F. and Levy S. (2012) propose social security funding reform in Mexico through extending the VAT's tax basis, raising its rate and reducing payroll taxes. Barreix, Bes and Roca (2011) proposed generalizing the tax base and compensating the lowest deciles with income redistribution.

¹⁴ One of the justifications for excise taxation on fuels has been the negative environmental externalities that they generate. Nevertheless, this factor was not taken into account in LAC when defining its tax treatment.

¹⁵ See Glassman et al. (2010) for a discussion of the impact of chronic illnesses in LAC.

Argentina introduced export taxes to moderate the impact of these major devaluations, particularly on food prices, and in order to generate resources that would contribute to rebuilding financial solvency.¹⁶

2.4 The Role of the Tax Administration

Tax reforms introduced in the region during the last two decades encompassed as many changes in tax policy as in tax administration. This distinctive feature marked a departure from the region's past practices. Previously, the modernizing effort was frequently concentrated on reproducing up-to-date systems in developed countries without keeping in mind the cultural, political, economic and technological constraints that LAC tax administrations faced in order to implement such systems.

Institutional strengthening of tax administrations was part of the state modernization process that countries of the region faced. In most cases, this process began in agencies linked to the economic field such as central banks and entities responsible for the financial administration, which operate in the public treasury's domain.

In particular, over the twenty-year period, tax administrations of the region abandoned tax organizational structures, replacing them with others that ranged from structures centered on functions to those designed to revolve around the client (taxpayer). Of these structures, the latter currently prevails. For the majority of the tax administrations, most of the financial and management autonomy that accompanied the strengthening process was manifested in the massive incorporation of technology, taking advantage of the advances made in this arena over the last two decades and placing these entities at the forefront of e-government in the respective countries.¹⁷

2.5 The Development of Social Security Revenue

Revenue from social security is derived from obligatory contributions from public systems as well as from the private sector. As shown in section four, the region has extensive experience in the private management of social security systems, mainly covering health and retirement services.

Many LAC countries carried out pension system reforms during the 90s in order to pursue objectives related to restoring public finance health, reducing the creation of contingent state sector liabilities and encouraging the creation of capital markets in which pension fund administrators could invest pensioner's money. Due to the fact that many of these systems presented low benefit coverage and low performance levels some governments introduced modifications to the system (Chile) and even reversed the pension reform (Argentina).¹⁸

¹⁶ The introduction of export taxes has also been justified by the ease of their administration (Sturzenegger 2006). However, attention must be paid to their design in order to avoid undesired consequences (see Barreix, Benítez, Bés and Velayos 2013).

¹⁷ See Barreix, Bermudez, Díaz Yobero, Pecho, Vásquez and Velayos (2013) for an analysis of tax administration modernization.

¹⁸ Private participation maintained in the health sector.

Currently, social security mobilizes a significant amount of resources. In the future, the demand for funding will increase as the population's life expectancy increases and the epidemiological transition through which chronic diseases rise to prominence is consolidated. Both phenomena will take place in the context of a demographic change in which the number of retirees in relation to active workers will grow.

Along the same vein, tax revenue dedicated to financing the social security system—currently providing between 5 to 8 percent of the GDP as reported in Argentina, Brazil, Chile, Costa Rica, Panama and Uruguay—may not be sufficient to finance the system's future demands. More resources will be required, most likely by expanding sources, diminishing benefits, or some combination of both measures. Notably, most of the countries included in this study should make a stronger effort than they are currently making to finance the system as their societies demand minimum standards of welfare for their retired classes. In this case, proposals like those presented by Antón, Hernández and Levy (2012) could be an alternative for policy makers.

2.6 The Development of Proceeds from Natural Resources

This subsection refers to revenue that the state receives directly through a tax payment, cannon, royalty, or fee as a result of the exploitation of natural resources.¹⁹ Examples of these resources are minerals or hydrocarbons, but can also be naturally renewable, such as the hydroelectric dams that Panama shares with Argentina and Brazil or the Panama Canal. As shown in Table 2, these resources are significant in various countries of the region.

¹⁹ Export taxes in Argentina should also appear in this section. Generally, however, these taxes are classified under foreign trade taxes. Moreover, Argentina taxes all export production (including manufacturing), although with differentiated rates.

Table 2						
Development of Revenues Derived from Natural Resources (% of GDP)						
	1990/1994	1995/1999	2000/2004	2005/2010	2005/10 vs 1990/94	Var. %
					Var. percentage points	
Bolivia	4.06	2.98	2.73	8.73	4.68	115.20%
Chile	1.64	0.74	1.6	2.15	0.51	31.20%
Colombia	0.27	0.45	1.5	2.95	2.68	1003.10%
Ecuador	2.76	3	2.48	3.32	0.56	20.20%
Guatemala	0.23	0.08	0.37	0.39	0.16	71.80%
Mexico	4.85	5.06	5.32	8.34	3.49	71.90%
Panama	1.6	1.34	2.3	3.67	2.07	129.70%
Paraguay	2.5	2.52	3.89	2.99	0.49	19.60%
Peru	-	-	-	0.13	0.13	n/a
T&T	7.26	4.5	6.74	13.92	6.66	91.60%

Source: Authors' own calculations based on IDB/CIAT Database

The availability of revenue derived from the exploitation of natural resources has been identified as one of the factors discouraging governments from tax collection efforts, thus delaying citizenship formation and country development. For these reasons, some authors consider such resources a curse (*resource curse*)²⁰. In simplified form, the argument is that taxation establishes a link between the government and its citizens through which citizens contribute to the resources required to finance the services the state provides. This gives citizens the incentive to demand that those services be of good quality and to civically participate in the appointment and control of their elected governments. According to this argument, leaders will prefer to avoid mobilizing resources through taxation while alternate methods are available (for example, those derived from the exploitation of natural resources) in order to avoid citizen control.

Without wishing to further this discussion, experience reveals that one cannot ignore that the generation of revenue through the exploitation of natural resources could have discouraged taxation development in Mexico, Panama and Trinidad and Tobago during this paper's period of analysis. In the case of Mexico and Panama the EFP is relatively low, around 20 percent of the GDP. In contrast, Trinidad and Tobago has a 12 point higher EFP. Nevertheless, the concerning factor is not exclusively focused on the possibility that natural resource availability may have caused tax

²⁰ See Moore (2007) for a discussion of this subject.

discouragement. The biggest problem is that these resources, both in Mexico and Trinidad and Tobago, are hydrocarbons—a non-renewable resource whose main deposits have entered a stage of declining production. If new deposits are not discovered this will create a significant challenge for public finance in both counties over the course of the next decade.

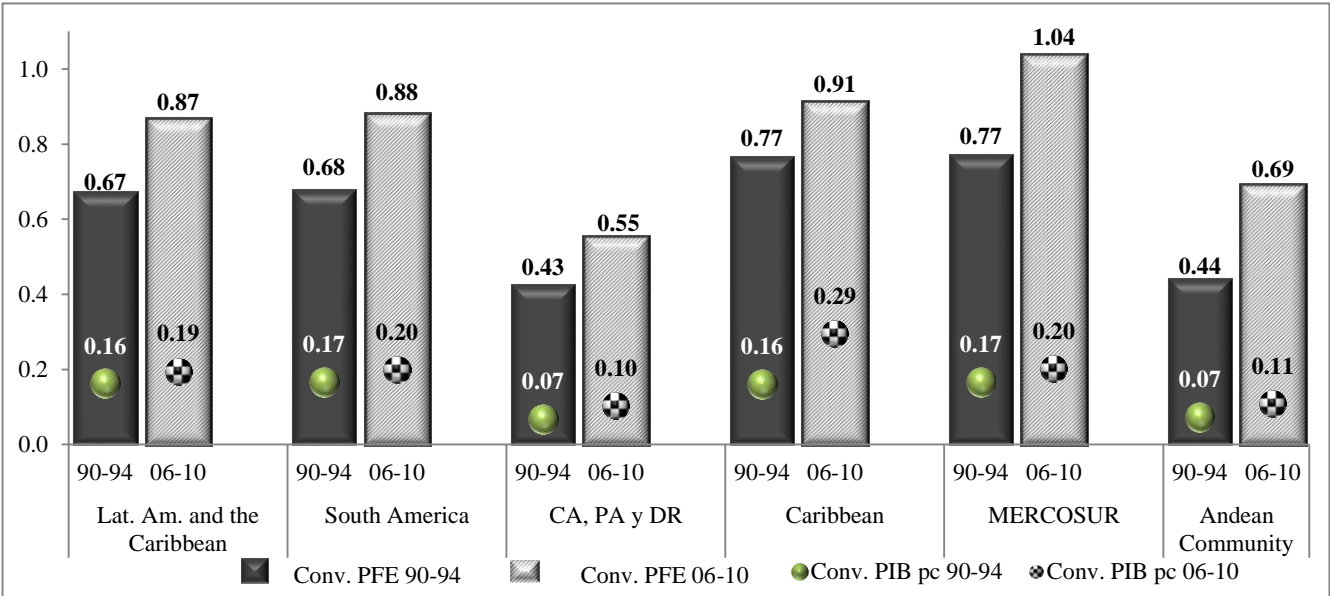
3. Comparative Analysis of the Development of the Equivalent Fiscal Pressure in Latin America and the Caribbean

This section analyzes the comparative development of EFP using three criteria: (a) convergence, (b) chronological comparison, and (c) fiscal effort. These three are different ways of analyzing the development of EFP over time for each country of the region, mainly from the perspective of total and per capita GDP but also considering other variables that have structural effects on the fiscal burden.

3.1 Convergence

Figure 5 shows the convergence of the EFP and per capita GDP of LAC and the OECD. This indicator measures the extent to which a given variable (in this case LAC’s EFP and per capita GDP) converges with or diverges from a reference level (in this case the levels of the OECD). In this study, Chile and Mexico are included in LAC and not in the OECD.

Figure 5. EFP and Per Capita GDP: Convergence with OECD^{1/2/}



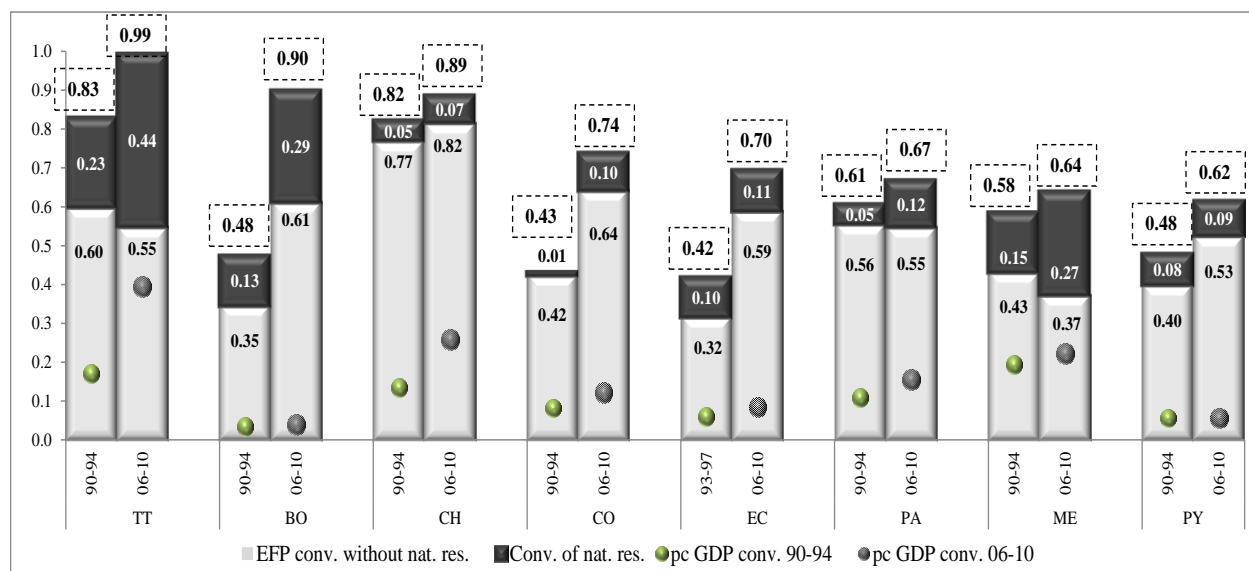
Source: BID-CIAT (2012), WEO
 1/ EFP-pc GDP convergence = weighted average LAC EFP-LAC pc GDP / weighted average OECD fiscal pressure.
 2/ Average fiscal pressures and per capita GDPs weighted by GDP in current dollars of each country.

To calculate convergence, we compare the two variables mentioned, taking the LAC data for the numerator and the OECD data for the denominator. For example: (Equivalent) Fiscal Pressure of LAC/Fiscal Pressure of OECD.

Figure 5 shows that LAC has converged more closely in fiscal pressure than in per capita GDP. Convergence reached 67 percent in the five-year period 1990–1994, and 87 percent in the period 2006–2010, a rise of 20 percentage points; in the same period, per capita GDP convergence rose by only three percentage points (from 16 percent to 19 percent). Both the group fiscal pressures and per capita GDPs are averages weighted by each country’s GDP in current dollars.²¹

In other words the region, without having significantly improved its income level relative to the OECD, has substantially increased its fiscal pressure, and indeed in Mercosur this has exceeded the OECD on weighted average. Per capita GDP in Mercosur is five times below the OECD average (0.20) but fiscal pressure is higher (1.04). Even in the Central American countries that have the lowest fiscal pressure in the region, the convergence ratios between the two periods rose by more than 25 percent.

Figure 6. Convergence of EFP (with and without Natural Resources) and Per Capita GDP with OECD ^{1/ 2/}



Source: IDB-CIAT (2012). WEO.

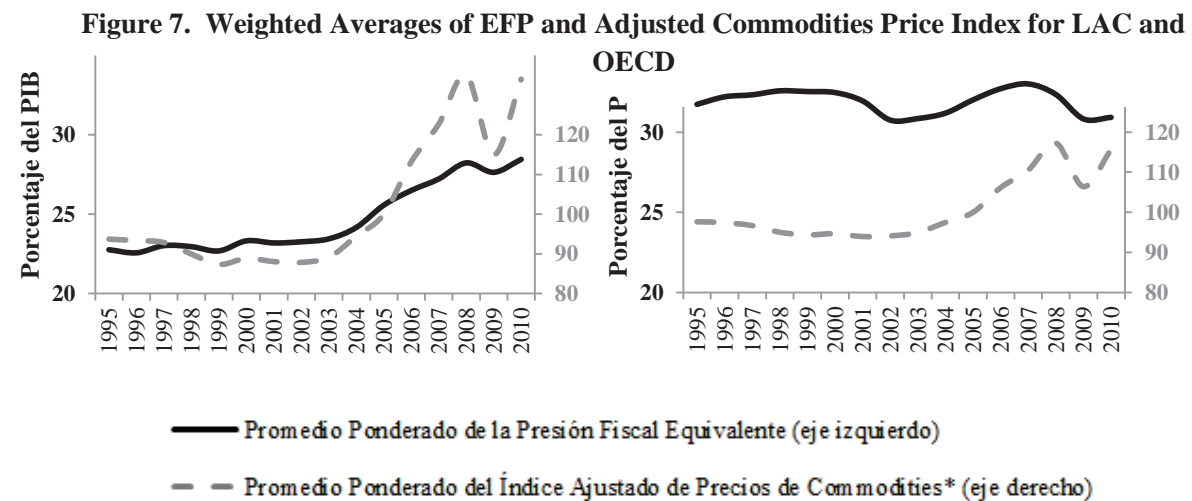
1/ Average fiscal pressure and per capita GDP weighted by GDP in current dollars of each country. 2/ For Ecuador, fiscal pressure information is available from 1993 onwards.

The findings, however, are not equally favorable or uniform if the analysis centers on countries where income from natural resources is significant (see Figure 7). Colombia, Bolivia, Paraguay and Ecuador have made a significant fiscal effort with and without natural-resource revenues. Trinidad

²¹ Note that we are examining groups of countries (LAC and the OECD) in which there are wide disparities in the average values of EFP and per capita GDP.

and Tobago, Panama and Mexico have experienced divergence if we exclude natural resources (for example, Mexico falls from 0.43 to 0.37 without natural resources, though it converges from 0.58 to 0.64 with such revenues). This evidences the dependence and vulnerability of these countries' fiscal revenues in the face of fluctuations in the income from natural resources.

In this sense, the EFP increase is strongly correlated with the increase of LAC export commodities prices, which is not noted in OECD countries. The impact of commodities on the EFP has two effects: 1) direct effect on revenue derived from natural resources, 2) indirect effect caused by the impact of exchange terms on the level of activity, and therefore, on the countries' tax collection.



+ Excludes Chile and Mexico.

* The EFP series was weighted by GDP in current US dollars. The commodities series was weighted by the value of each country's total exports in US dollars. See Summary 1 for a more detailed description of the variables.

Source: prepared by the authors on the basis of data from WTO (2013), IMF (2013) and IDB-CIAT (2012)

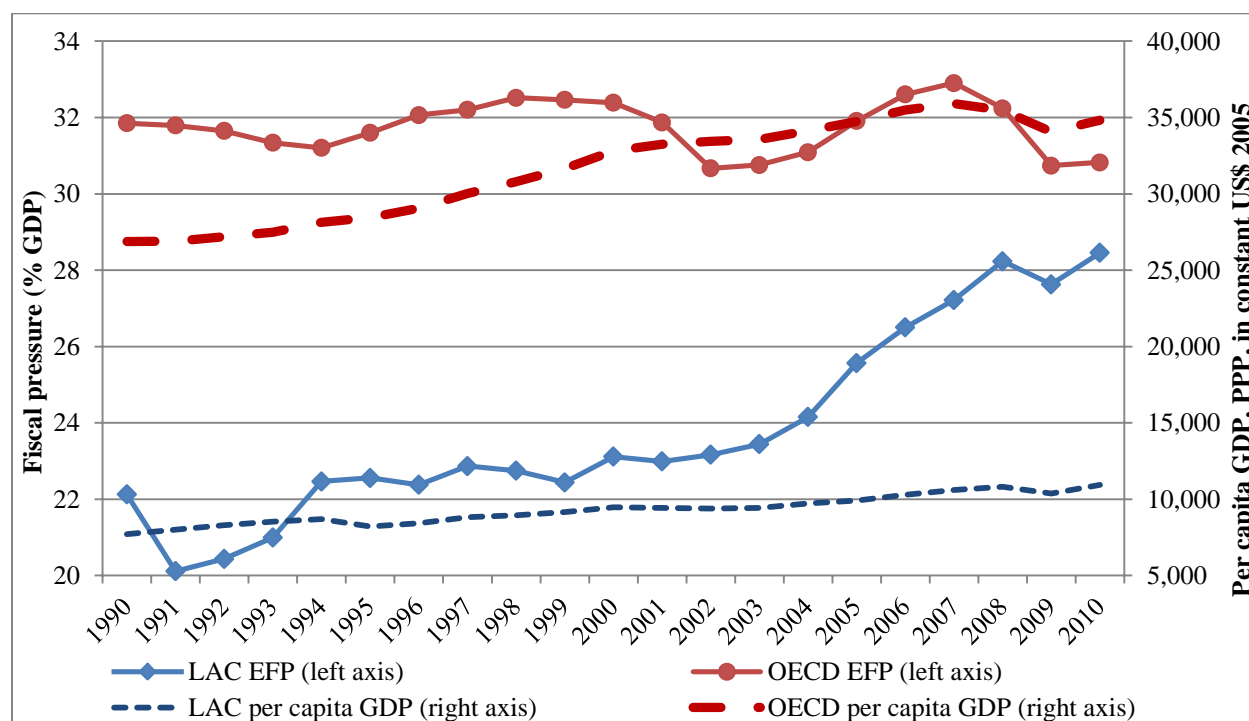
Apart from the validity of the method, it is fair to acknowledge that the tax burden of the developed countries (OECD) was that of fiscally mature economies even by the 1990s. In those economies, it was very probably unnecessary to increase the share of output subject to tax in order to finance public services that already enjoyed high levels of coverage (see Figures 8 and 9).

Considering five-year averages, therefore, there is a clear trend of fiscal convergence (33 percent increase in two decades) and an almost static convergence in per capita income (9 percent). All in all, this measure of relative growth, compared to the average of the developed countries, shows that the region has made a significant effort to increase fiscal revenues.

As Figure 8 shows, this development is immediately apparent if we analyze the change between the beginning and end of the period. For the OECD countries, the average EFP weighted by GDP in current dollars for each of the five years zigzags around the axis of 32 percent of GDP. At the same

time, LAC's EFP rose from 22.1 percent to 28.5 percent in the period, an increase of almost 30 percent.

Figure 8. Trends in EFP and Per Capita GDP^{1/} in LAC and OECD



Source: IDB-CIAT (2012); World Bank.

1/ Average fiscal pressure and per capita GDP weighted by GDP in current dollars of each country.

3.2 Chronological Comparison

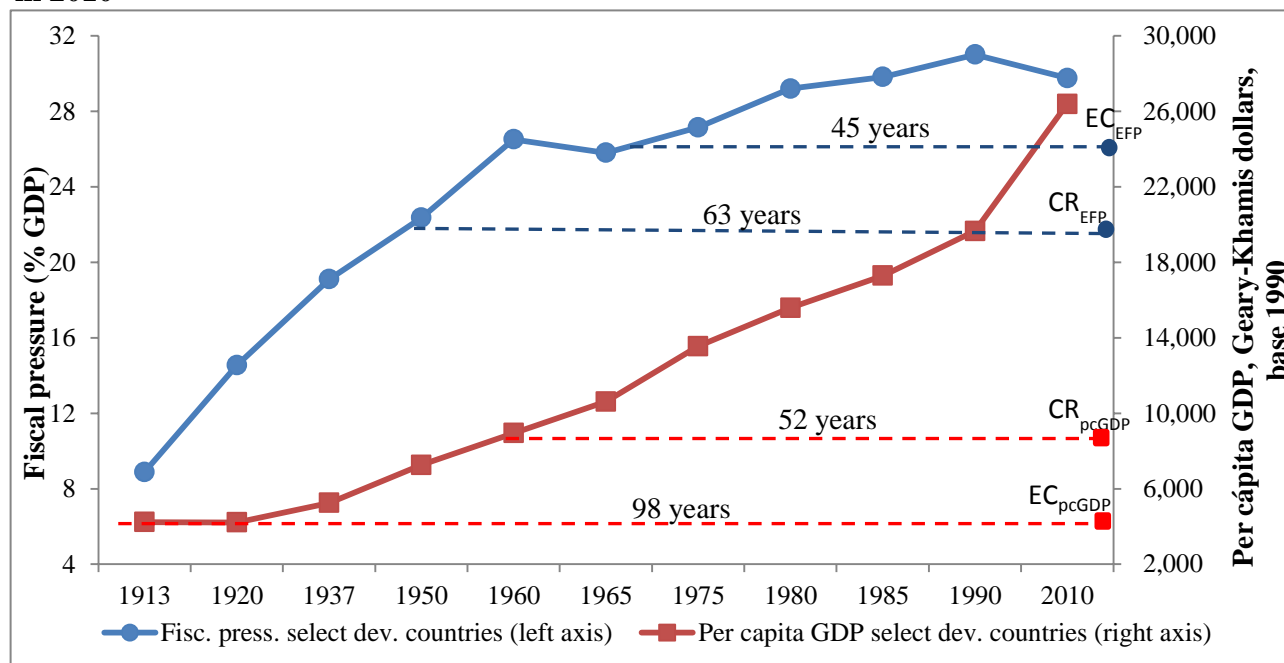
The second comparison of the development of fiscal pressure is based on the historical relationship between the fiscal burden and the development level, and for that purpose we use the same variables: fiscal burden/GDP and per capita GDP. This reflects the effort made by each country over a longer period through a comparison with the historical performance of the developed countries. We call this analysis of EFP development the “chronological comparison.”

The exercise consists of finding, for the EFP and per capita GDP of each Latin American country in 2010, the year in which each of these variables reached an equivalent value relative to the average of a group of 11 developed countries.²² For instance, Ecuador’s (equivalent) fiscal pressure in 2010 is

²² Germany, Australia, Spain, United States, France, Italy, Japan, Norway, New Zealand, Portugal, United Kingdom.

equal to the average of the 11 developed economies in 1965, while its per capita GDP²³ in 2010 is equal to the average of those countries in 1912 (in purchasing power parity).

Figure 9. Comparison of EFP and Per Capita GDP of LAC and Selected Developed Countries^{1/} in 2010



Source: Maddison (2010); Mitchell (1998, 2003); Schuknecht and Tanzi (2000); Statistical Yearbook of the League of Nations.
1/ Average fiscal pressure and per capita GDP weighted by GDP in Geary-Khamis dollars of each country (base 1990).

Table 3. Equivalence in Years by Country in 2010 of EFP and Per Capita GDP with Average of Selected Developed Countries

Country	Equivalence to 2010 in selected countries		Gap in years EFP-per capita GDP
	EFP	Per capita GDP	
AR ^{1/}	2010	1969	41
BO	1975	1897	78
BR ^{1/}	2010	1949	61
CH	1975	1975	0
CO	1950	1941	9
CR	1947	1958	-11
EC	1965	1912	53
ES	1932	1890	42
GU	1917	1934	-17
HO	1937	1873	64

Country	Equivalence to 2010 in selected countries		Gap in years EFP- per capita GDP
	EFP	Per capita GDP	
JA	1953	1904	49
ME	1942	1952	-10
NI	1945	1839	106
PA	1950	1950	0
PE	1934	1940	-6
PY	1948	1903	45
DR	1924	1936	-12
TT ^{1/}	2010	1995	15
UR	2010	1967	43

Source: authors' calculations.

1/ In 2010 Argentina, Brazil, and Trinidad and Tobago had an EFP higher than the average of the OECD countries.

²³ The per capita GDP used is measured in Geary-Khamis dollars (base: 1990), which establishes an equivalence in purchasing power parity with the United States for each moment in time. This is the methodology used in the Angus-Maddison Database (2010).

Apart from technical constraints that can affect any effort to measure fiscal pressure and per capita GDP at purchasing power parity in constant dollars over such a lengthy period (for which purpose we trust the sources cited), there are some technical considerations to be made:

In terms of tax it must be acknowledged, on the one hand, that fiscal pressure is calculated in current prices. On the other hand, over such a lengthy period the countries under review had other revenues that were not assessed as fiscal income, from war reparations to imperial revenue originating in monopoly concessions or the use of resources or territories.

But also in terms of economic history, it is apparent that this long period witnessed very different conditions that influenced the role of the state and consequently its revenue. These include the differing degrees of commercial and financial openness and integration, the sectoral structure of production, and the consolidation of the welfare state.

To make the comparison we use what we call the EFP-per capita GDP “gap” in years: this is the difference between the year in which the country in question attained the same fiscal pressure as the comparison group and the year in which it attained the same per capita GDP (GDP-weighted average) as the group of 11 developed countries.

Table 3 in Figure 9 shows that in five countries the year of per capita GDP equivalence is later than the year of EFP equivalence: Guatemala, Dominican Republic, Costa Rica, Mexico and Peru. In other words, the fiscal pressure in these countries is below their development level, measured by per capita GDP. Moreover, we can conjecture that this lag is greater given that the fiscal pressure in the developed countries has experienced a significant historical increase (growing by almost 3.5 times in a century).

The other countries are very different from these five (except for Chile and Panama, where the “gap” is zero). In these others the fiscal pressure is higher (in some cases much higher) than their development level. Argentina and Brazil are striking in this regard,²⁴ because their EFP is higher than the average of the developed countries considered here and their fiscal burden is more than 40 and 60 years, respectively, above their corresponding income level.

3.3 Equivalent Fiscal Effort

The third criterion used to analyze the development of fiscal revenues is the fiscal effort index, defined as the ratio between the actual fiscal burden and a burden that is estimated econometrically using a model that considers the main determinants (variables) affecting collection capacity.

Gupta (2007) and Le et al. (2012) have defined the tax effort as the extent to which governments collect tax effectively. Nonetheless, in general these measures have only considered taxes collected by the central government and have ignored other permanent sources of government revenue. This is

²⁴ In Nicaragua, Honduras, El Salvador and Bolivia, the equivalent per capita GDP of the countries considered corresponds to the nineteenth century, according to the Maddison Database (2010).

especially true of commodities producers, whose revenues depend largely on international commodities prices. Omission of these additional sources of income leads to an underestimation of the fiscal effort in natural resource-rich countries, which in turn can lead to mistaken conclusions about their overall fiscal revenues.

We were able to devise an econometric model to predict EFP using a linear model in a panel of 71 countries over a period of 16 years (1995–2010). The quotient obtained from the observed EFP over the estimated EFP gives the (equivalent) fiscal effort index.

The preferred specification was:

$$\frac{EFP}{GDP} = \alpha + \beta_1 \text{GDP} + \beta_2 \text{agriculture} + \beta_3 \text{te} + \beta_4 \text{de} + \beta_5 \text{e} + \epsilon$$

In the model, fiscal pressure is the dependent variable set as a percentage of the GDP, α is the constant and ϵ is the error. The set of variables is described in the following table:

Summary 1. Variables Used in the Model

Variable	Definition	Source
Equivalent fiscal pressure (<i>à la</i> IDB-CIAT)	Revenues comprise national and subnational taxes, compulsory, public and private social security and healthcare contributions, as well as unrestricted income from the exploitation of renewable and non-renewable natural resources.	IDB-CIAT (2012), IMF (2013) and countries' national accounts.
Value added of agriculture (% of GDP)	Agriculture includes forestry, game and fisheries, as well as agricultural exploitation and livestock production. The value added is a sector's net production after adding all the products and subtracting intermediate inputs. It is calculated without deductions for asset depreciation or the decline and degradation of natural resources.	World Bank national accounts and national account data from OECD.
Per capita GDP (constant 2005 dollars)	Per capita GDP is gross domestic product divided by the population at mid-year. GDP is the sum of the value added by all producers resident in the economy plus all taxes on products, minus any subsidy not included in the value of gross products. It is calculated without deductions for depreciation of manufactures or for the decline and degradation of natural resources. The data are in constant 2005 dollars.	IMF national accounts and national account data from OECD.
Trade opening (% of GDP)	Trade openness is the sum of exports and imports of goods and services measured as a share of GDP.	National accounts from the World Bank, OECD and Eurostat.
Export price index (base = 2005)	Weighted average that measures the effect of the variation of the prices of a basket of commodities in an economy weighted by its commercial structure.	Authors' calculations based on data from IMF (2013) and WTO (2013).

The generalized estimating equation (GEE) model was used to correct for the autocorrelation evidenced by statistical testing, which also revealed the presence of heteroscedasticity (White and Breusch-Pagan tests) in the data. This estimating method uses population averages to correct for autocorrelation in the data and thus to obtain unbiased parameters.

The results yielded by the model are consistent with those of earlier studies (Piancastelli, 2001; Gupta, 2007; and Le et al., 2012). Most of the variables are robust in the various specifications used, and the joint significance tests showed that the coefficients are effectively different among themselves.²⁵ This confirms that agriculture, and the metals and mineral-extracting sectors are hard-to-tax sectors, while there is a positive association between the variations in commodities prices and EFP, as expected.²⁶ The following summary table presents the main findings of the equivalent fiscal effort index model (actual collection over estimated collection, calculated using the chosen specification) for the countries under review.²⁷

Summary 2. Linear Model of the Population Average (GEE Population Average Model)

	Dependent Variable: Equivalent Fiscal Pressure (% GDP)
GDP per capita (2005 constant dollars)	0.065624*** (0.0156)
Value added of agriculture (% of GDP)	-0.0602655*** (0.0148)
Trade Openness	0.0597554*** (0.0179)
Weighted average of commodities adjusted to the export structure	0.0713081*** (0.0256)
Constant	2.193476*** (0.1642)
Number of Observations	1,127
Number of Groups	71
Group and Time Variables	Country and Year

All variables in natural logarithms
Standard error in parenthesis *** p<0.01, ** p<0.05, * p<0.1

²⁵ See Benítez (2013) for more detail on the specifications used.

²⁶ The institutional variables had the expected sign in most of the specifications. Sometimes, however, their inclusion limited the significance of other variables, biased the interpretation of them and substantially constrained the number of available observations. For these reasons we chose to exclude them in the specification chosen to build the index.

²⁷ GEE models do not estimate R2 since they assume that the dependent variable can be expressed as a linear function of the explanatory variables. For a more detailed discussion see Gardiner et al., 2009; Hubbard et al., 2010; and Ghisletta and Spini, 2004.

Summary 3 presents the results of the fiscal effort for all the countries under review in the period 2006–2010.

Additionally, to provide a better illustration we have grouped the results by region in Figure 10. The location of a country in a quadrant explains its development relative to the base period (average 1995–1999). Thus, the countries in quadrant I are those that after a decade are still not attaining the potential estimated by the model. In LAC's case this quadrant mostly contains the Central American countries and those that receive revenues from natural-resource exploitation.

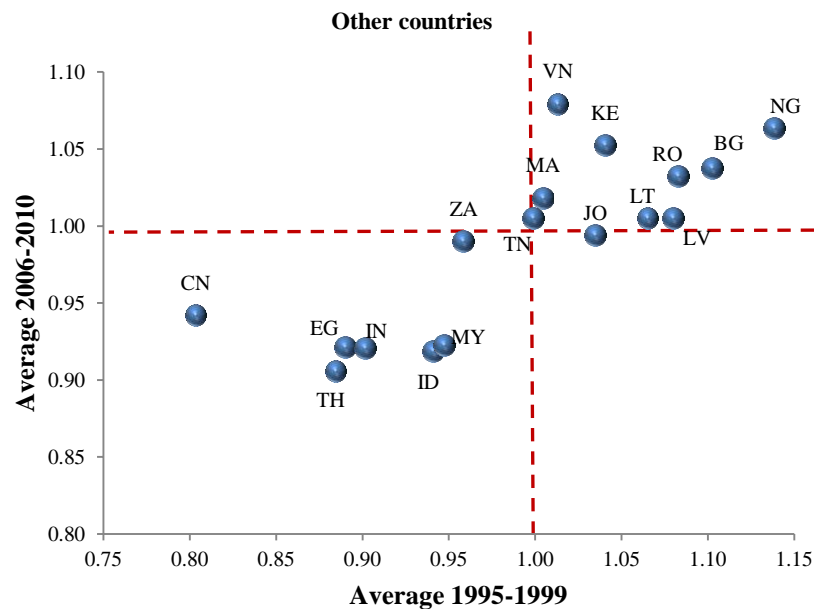
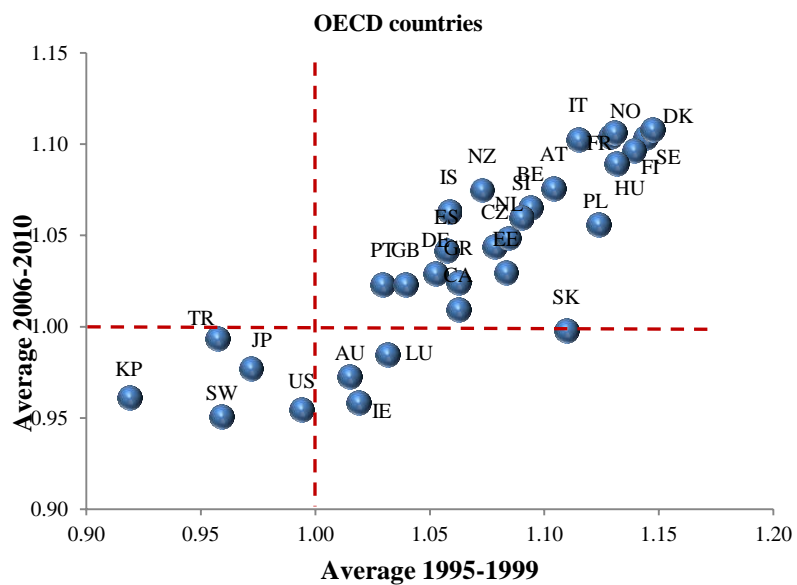
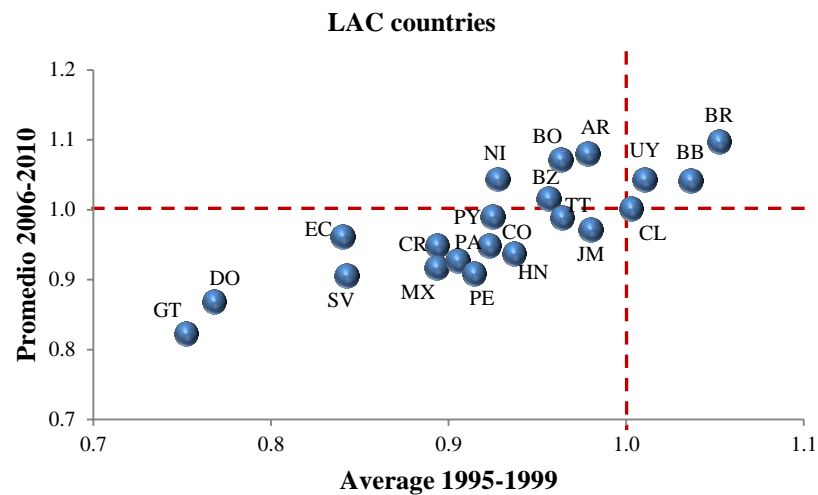
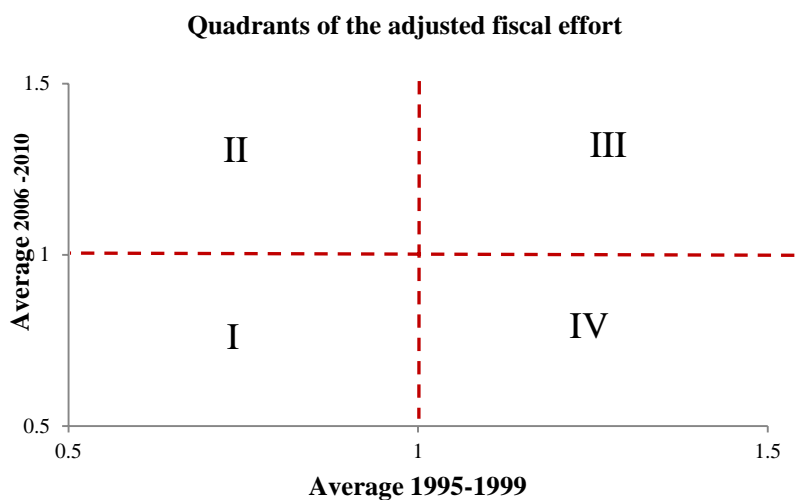
Meanwhile, the countries in Quadrant II have made significant progress, and have closed the gap in terms of their revenue collection potential. Quadrant III holds the economies that in both periods collected more than the amount estimated by the model: the MERCOSUR countries, except for Paraguay. Of note are the levels of collection efficiency attained by the OECD countries, which are mainly in this quadrant. Finally, the countries in Quadrant IV are those whose tax effort has declined relative to the initial period; no LAC country is located here.

Summary 3. Equivalent Fiscal Effort Index

País		1995-1999	2006-2010	Country		1995-1999	2006-2010	Country		1995-1999	2006-2010
<i>Latin America and the Caribbean</i>				Belgium	BE	1.09	1.07	Sweeden	SE	1.15	1.11
Argentina	AR	0.98	1.08	Canada	CA	1.06	1.01	Switzerland	SW	0.96	0.95
Barbados	BB	1.04	1.04	Czech Republic	CZ	1.08	1.04	Turkey	TR	0.96	0.99
Belize	BZ	0.96	1.02	Denmark	DK	1.14	1.10	UK	GB	1.04	1.02
Bolivia	BO	0.96	1.07	Estonia	EE	1.08	1.03	USA	US	0.99	0.95
Brazil	BR	1.05	1.10	Finland	FI	1.14	1.10	<i>Other Countries</i>			
Chile	CL	1.00	1.00	France	FR	1.13	1.10	Bulgaria	BG	1.10	1.04
Colombia	CO	0.92	0.99	Germany	DE	1.05	1.03	China	CN	0.80	0.94
Costa Rica	CR	0.89	0.95	Greece	GR	1.06	1.02	Egypt	EG	0.89	0.92
Dominican Rep.	DO	0.77	0.87	Hungary	HU	1.13	1.09	India	IN	0.90	0.92
Ecuador	EC	0.84	0.96	Iceland	IS	1.06	1.06	Indonesia	ID	0.94	0.92
El Salvador	SV	0.84	0.91	Ireland	IE	1.02	0.96	Jordan	JO	1.03	0.99
Guatemala	GT	0.75	0.82	Israel	IL	1.03	1.03	Kenya	KE	1.04	1.05
Honduras	HN	0.94	0.94	Italy	IT	1.11	1.10	Latvia	LV	1.08	1.01
Jamaica	JM	0.98	0.97	Japan	JP	0.97	0.98	Lituania	LT	1.07	1.01
Mexico	MX	0.89	0.92	South Korea	KP	0.92	0.96	Malasia	MY	0.95	0.92
Nicaragua	NI	0.93	1.04	Luxemburg	LU	1.03	0.98	Morocco	MA	1.00	1.02
Panamá	PA	0.90	0.93	Holand	NL	1.08	1.05	Nigeria	NG	1.14	1.06
Paraguay	PY	0.92	0.95	New Zeeland	NZ	1.07	1.07	Romania	RO	1.08	1.03
Perú	PE	0.91	0.91	Norway	NO	1.13	1.11	Singapur	SG	0.76	0.69
Trinidad y Tobago	TT	0.96	0.99	Poland	PL	1.12	1.06	South Africa	ZA	0.96	0.99
Uruguay	UY	1.01	1.04	Portugal	PT	1.03	1.02	Thailand	TH	0.88	0.91
<i>OECD Countries</i>				Slovakia	SK	1.11	1.00	Tunisia	TN	1.00	1.00
Australia	AU	1.02	0.97	Slovenia	SI	1.09	1.06	Vietnam	VN	1.01	1.08
Austria	AT	1.10	1.08	Spain	ES	1.06	1.04				

The equivalent fiscal effort is the ratio between the observed value of the equivalent fiscal pressure and the value estimated by the model.

Figure 10. Developments in the Fiscal Effort Index



3.4 Summarizing the Findings of the Comparative Development of Equivalent Fiscal Pressure

Table 4 summarizes the three criteria used to analyze the development of EFP.

Table 4. Summary of the Findings of the Three Assessment Mechanisms of Comparative Development of EFP

Country	Quotient of the EFP convergence indices (2006–10/1990–94) >1 ^{1/2/}	Chronological comparison (gap EFP- per capita GDP ^{3/}) Yes, if positive	Tax effort (index >= 1)	
			1995-1999	2006-2010
Argentina	Yes	Yes	No	Yes
Barbados	Yes	-	Yes	Yes
Belize	Yes	-	No	Yes
Bolivia	Yes / yes	Yes	No	Yes
Brazil	Yes	Yes	Yes	Yes
Chile	Yes / yes	No	Yes	Yes
Colombia	Yes / yes	Yes	No	No
Costa Rica	Yes	No	No	No
Ecuador	Yes / yes	Yes	No	No
El Salvador	Yes	Yes	No	No
Guatemala	Yes	No	No	No
Honduras	Yes	Yes	No	No
Jamaica	Yes	Yes	No	No
Mexico	Yes / no	No	No	No
Nicaragua	Yes	Yes	No	Yes
Panama	Yes / no	No	No	No
Paraguay	Yes / yes	Yes	No	No
Peru	Yes	No	No	No
Dom. Rep.	Yes	No	No	No
Trinidad and Tobago	Yes / no	Yes	No	No
Uruguay	Yes	Yes	Yes	Yes

1/ Quotient of the convergence index = convergence 2006–2010 / convergence 1990–1994.

2/ For the countries with natural-resource revenues (Bolivia, Chile, Colombia, Ecuador, Mexico, Panama, Paraguay, Trinidad and Tobago) the EFP convergence index is shown with and without those revenues. Not including Peru which began to collect tax in this category in recent years.

3/ For Chile and Panama, the gap in years between the equivalences of the EFP and per capita GDP with developed countries is zero. For Barbados and Belize we have not calculated the gap because data are unavailable on per capita GDP in Geary-Khamis dollars.

Table 4 indicates three kinds of development:

- a) **Strong effort.** This group comprises the countries (in bold type) of the Southern Cone plus Barbados, Belize, Bolivia and Nicaragua, which have made a great deal of effort to increase fiscal revenues. Some of these even had a weak effort quotient of less than one in the early 1990s.
- b) **Weak effort.** This group comprises those countries (grey background) whose indicators are insufficient to boost fiscal revenues. Three of them enjoyed significant income from natural resources in the period of study (Mexico, Panama, and Trinidad and Tobago). In those countries the convergence indices quotient is less than one when natural-resources income is excluded, revealing a divergence in the tax effort relative to the OECD countries. The others are Costa Rica, Guatemala, Peru and the Dominican Republic.

It should be acknowledged that the quotients of the convergence indicators (including natural resources) are greater than one. Nonetheless, the comparison is with fiscally mature economies (OECD) and, moreover, the LAC countries in this group have made less relative progress on convergence.

- c) **Parsimonious effort.** This group comprises those jurisdictions (Colombia, Ecuador, El Salvador, Honduras, Jamaica and Paraguay) where the tax effort indicator is less than one (that is, they collect less than expected by the econometric model), but that have made positive progress on fiscal revenues in the other two indicators. Moreover, in all cases the 2006–2010 fiscal effort indicator is close to one (about 0.9) and is growing in most of them relative to the figure for the 1990–1994 period. In all, they have made parsimonious progress on EFP.

Finally, it is clear that the LAC countries, with few exceptions, have given impetus to fiscal revenues. Furthermore, several countries of the region have attained a collection rate that is similar, in GDP terms, to that of the developed countries, while many others remain very far from that. Nonetheless, because of the output differentials between the LAC and the developed economies, there is still a marked gap in the absolute values of effective tax revenues.

Figure 11, which measures how much the governments collect per inhabitant (in U.S. dollars), evidences this important revenue gap. For this measurement the nominal per capita GDP (in current dollars) was multiplied by the share of revenue of each tax (or group of taxes) and weighted by the current GDP in dollars for each sub-region. Next, for every five year period the values were averaged and then adjusted by the GDP deflator in U.S. dollars. In annexes 1 and 2 the exercise is plotted by sub-regional LAC group.

There are very large differences in absolute collection (dollars). While the OECD (weighted) average per inhabitant in the period 2006–2010 was US\$13,235, the LAC average was almost six

times less and that of Central America, Panama and the Dominican Republic (CA-PA-DR) was more than 17 times less. The (weighted) average EFP of the developed countries was only 16 percent higher than that of LAC, but 80 percent higher than that of the CA-PA-DR group.

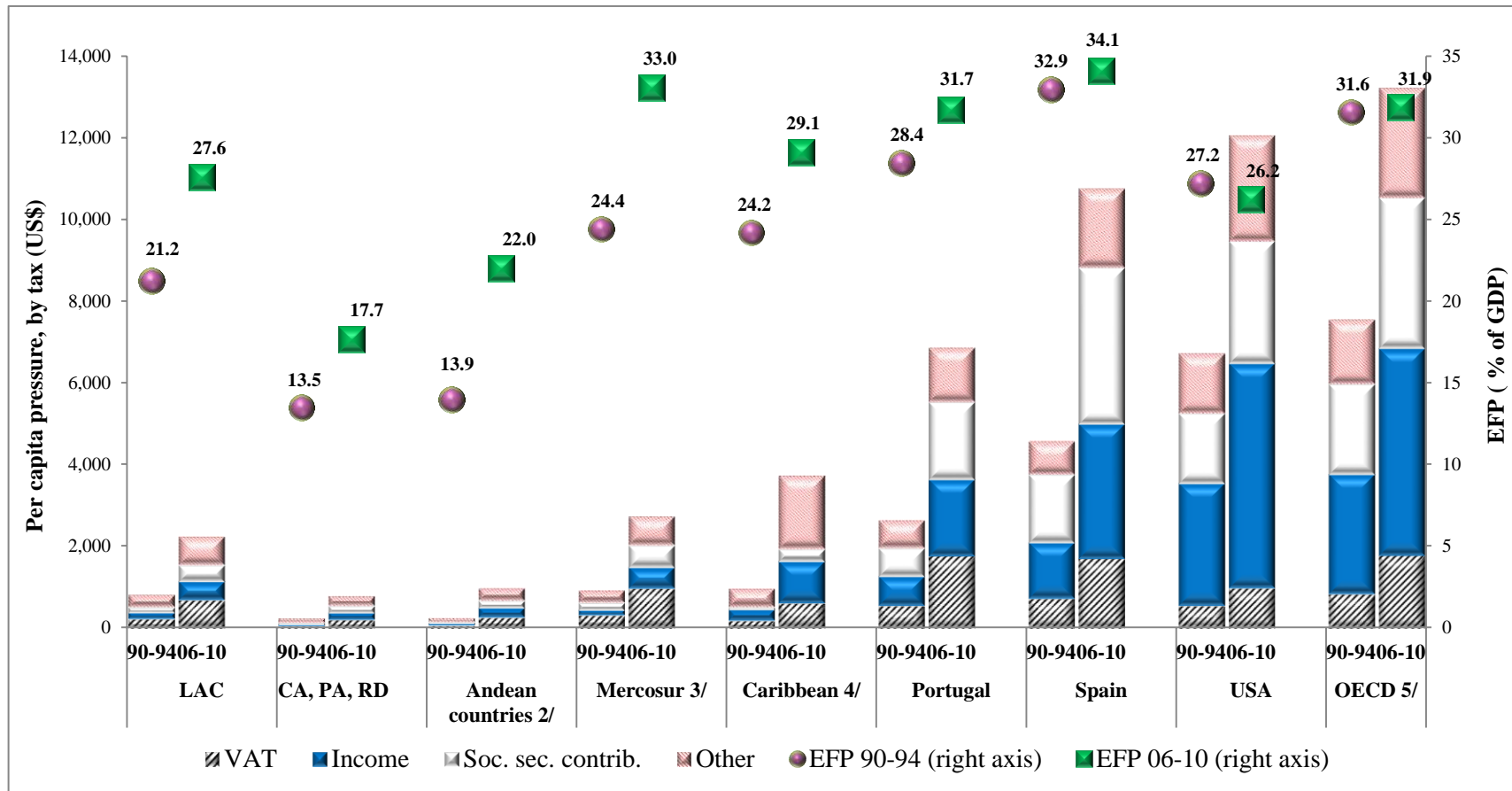
Moreover, if we look at Portugal, the country with the lowest dollar income in the sample, we see that its actual collection per inhabitant is two and a half times the (weighted) average collection of Mercosur (US\$2,760), three of whose four members have among the highest per capita incomes and tax burdens in Latin America (Argentina, Brazil and Uruguay).²⁸ Portugal's fiscal pressure, however, is lower than Mercosur's average for 2006–2010 and includes some years of severe financial-fiscal crisis.

In all, the LAC countries' revenue collection in absolute terms is several times below that of the developed economies. It is true that much of the public spending in the developing economies is also "cheaper" in relative terms (lower salaries for a teacher or a police officer, for example), but it is indisputable that the fiscal resources of LAC and the OECD do not have the same purchasing power.

This has two important consequences for public finances in LAC. The first is that it will be difficult for government services to reach the levels of quality and coverage that the advanced countries have attained by virtue of their purchasing power. The second, and more important, is that the administrations in LAC cannot afford to lose a single tax dollar to evasion, avoidance, corruption or wasteful spending.

²⁸ In 2010 the four MERCOSUR members were Argentina, Brazil, Paraguay and Uruguay.

Figure 11. EFP Per Capita by Tax and as % of GDP^{1/} in LAC and OECD 1990-1994 and 2006-2010



1/ Average fiscal pressure and per capita GDP weighted by the current GDP of each country. 2/ Bolivia, Colombia, Ecuador, Peru. 3/ Argentina, Brazil, Paraguay, Uruguay, Chile. 4/ Barbados, Belize, Jamaica, Trinidad and Tobago. 5/ OECD excludes Chile, Slovakia, Slovenia, Estonia, Israel, Mexico and the Czech Republic.

4. Methodological Matters: What Do We Mean By “Equivalent Fiscal Pressure”?

Taxes are the main source of financing for the activities of a modern state. The OECD characterizes them thus:

“1. In the OECD’s classification, the term ‘taxes’ is confined to compulsory unrequited payment to general government. Taxes are unrequited in the sense that benefits provided by governments to taxpayers are not normally in proportion to their payments ...

“3. General government consists of the central administration and agencies whose operations are under its effective control, state and local governments and their administrations, certain social security schemes and autonomous governmental entities, excluding public enterprises. This definition of government follows that of the 2008 System of National Accounts.”²⁹

The exclusions implied by this definition make it inadequate for an analysis of the fiscal revenues of some LAC countries, since the resources collected through the tax system are complemented significantly by income from other sources. Perhaps the most important of these is income from the exploitation of natural resources. The above definition, moreover, is marked by another significant omission: resources from the private management of social security systems.

A few examples serve to illustrate the extent to which these exclusions would affect an analysis of fiscal revenues in some countries of the region.

Let us begin with income from natural resources. The OECD’s methodology includes only the profits of fiscal monopolies that are transferred to general government or used to finance spending by that level of government. The idea behind this is that revenue from fiscal monopolies derives from the market power that a state exercises with regard to those products. When the private sector engages in these activities, they are subject to the other taxes in force.

The main activities of fiscal monopolies considered in the methodology mentioned above are related to the production and marketing of alcoholic beverages, tobacco, hydrocarbons and their by-products, mining, and so on.³⁰ Notably, public services—which often enjoy a monopolistic or oligopolistic market position—are excluded. Examples of such services include the distribution of water, gas and electricity, transportation, and so forth. The reason, according to the OECD, is that “the primary purpose is normally to provide basic services rather than to raise revenue for government.” These transfers, therefore, are regarded as general government non-tax revenue.

While generally we accept the exclusion of public service enterprises, they should be included in some Latin American countries because both purposes (providing public services and generating revenue for general government) have a greater goal: contributing to economic development.

²⁹ OECD/ECLAC/CIAT (2012), Annex A.

³⁰ Consumption of these products is also normally taxed through excise duties and/or VAT.

Panama and Paraguay are paradigmatic examples. In the former, the Panama Canal plays a key role in international trade by cutting maritime journey times, while at the same time it provided annual income to the government equivalent to 3.7 percent of GDP during the period 2005–2010. For its part, Paraguay shares hydroelectric dams with Argentina and Brazil that, in addition to generating electricity, provided Paraguay with annual public revenues equivalent to 3 percent of GDP in the same period. At the same time, the magnitude and role of these infrastructure schemes have been determinant in both countries' development.

In addition to the income from these renewable resources is the revenue derived from the exploitation of non-renewable natural resources. Such income is especially important in Trinidad and Tobago, Bolivia and Mexico, where the treasuries benefited from annual oil revenues equivalent to 13.9 percent, 8.7 percent and 8.5 percent of GDP, respectively, between 2005 and 2010. In the same period, a smaller but equally significant contribution went to the treasuries of Ecuador, Colombia and Chile (3.8 percent, 3.0 percent and 2.2 percent of GDP, respectively). These resources include, among other things, royalties, fees, taxes on operating income and contributions to subnational governments, not all of them tax-related.

The second exclusion from the OECD definition is of payments to non-state entities that are part of the social security system, even though such contributions are compulsory. This exclusion is consistent with the experience of the European countries, which since the late nineteenth century have had *comprehensive* social security systems operating under the aegis of the state. LAC's experience, however, has been substantially different.³¹

First, for decades the countries of the region have had both privately run and state-run healthcare services financed by compulsory contributions.³² Traditionally, privately managed healthcare services provide to those working in formal labor markets.³³ In this case, users' access to services is determined by membership of the system offering the care, which is mainly acquired by compulsory contributions from the employee and the employer. State healthcare services, for their part, attend to the rest of the population. Usually they serve those with lower incomes, including those who work in informal labor markets and, in some cases, those who need more complicated care and who do not have the required coverage from their private service providers.

Because the financing of social security (healthcare, pensions and so on) is compulsory, the costs cannot be circumvented by the membership of formal labor markets. This is not the case with other compulsory insurance schemes, such as vehicle insurance, in which the regulation of commerce prevails and insurance can be avoided legally (following the same example, by not owning a

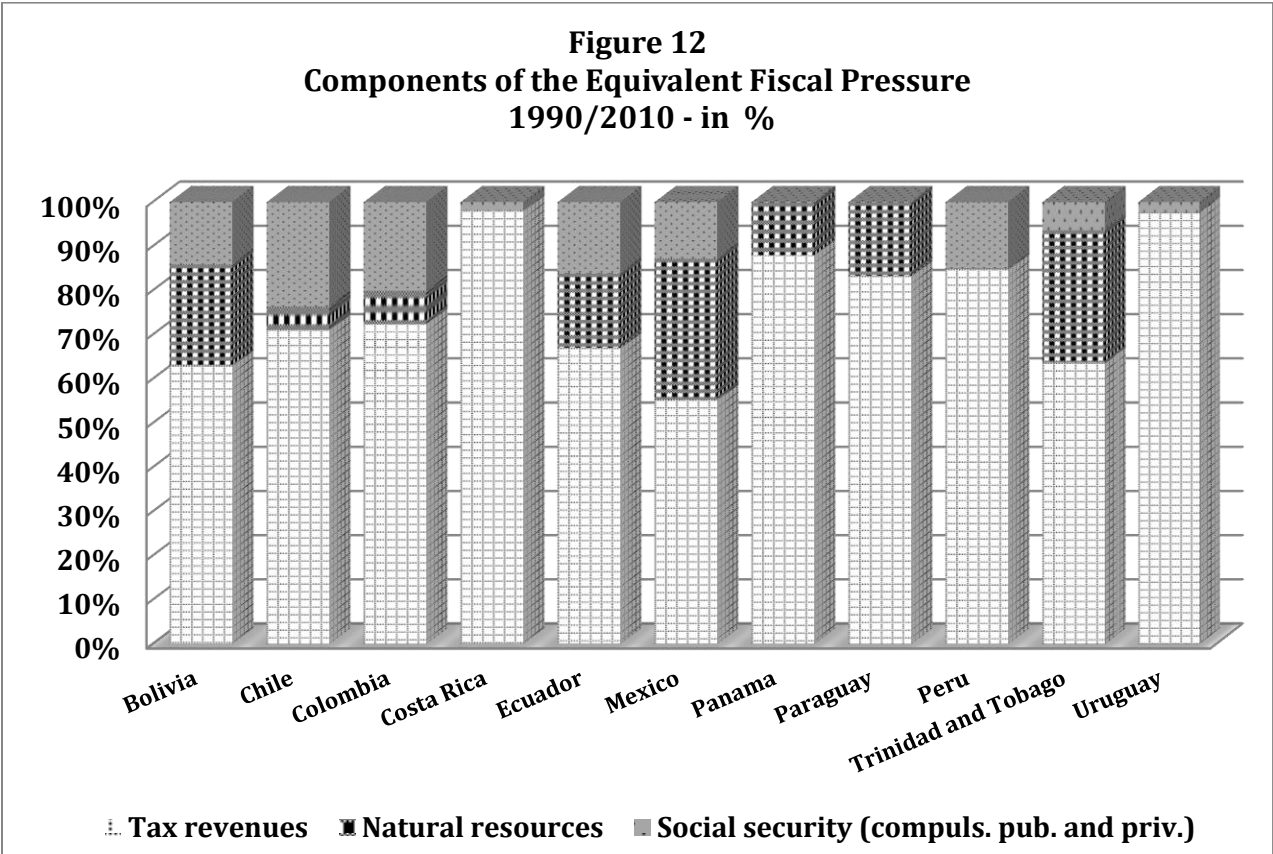
³¹ A large share of US social security contributions that are privately run would also be excluded. The question of parallelism between a tax and an obligatory social security contribution—independent of the system's public or private management—was raised in the 2012 U.S. Supreme Court verdict regarding the constitutionality of the health reform law. This is described in Box 1.

³² In Argentina private participation has significantly contributed to the health system for 70 years. This system is referred to as “social work” (*obras sociales* in Spanish) and is administered by the unions.

³³ Additionally, the middle- and high-income sectors *voluntarily* subscribe to the services of private healthcare providers. As these contributions are voluntary choices they are not part of the EFP.

vehicle). Moreover, this compulsory nature does not hamper the element of solidarity in social security. This is true of both the financing (contributions are a percentage of income) and of the service provision (a minimum level of services is covered, regardless of the contribution).

Private management of the social security system was extended to the pensions system with the Chilean reform of 1980. Over the next two decades, several countries replaced their state pension systems with mixed schemes founded on the provision of a basic universal service that is complemented by compulsory contributions to individual capitalization accounts run by companies managing private pension funds. Even in countries that chose not to make deep changes to their social security systems, there are privately run pension funds in which compulsory contributions complement the income of retired people.³⁴ Additionally, there is legislation allowing a taxpayer who has made contributions to either the public or private system to shift to the other system on fulfillment of certain conditions: this is the case, for example, in Colombia, Mexico and Peru.



³⁴ Argentina reversed its social security reform in 2008 when it returned to a pay-as-you-go scheme, but retained a significant private-sector presence in the healthcare system. This has existed for 70 years and is financed by compulsory contributions; it is known as “*obras sociales*” (literally, “social works”) and is managed by the trade unions.

The relative significance of natural resources and privately run social security systems within total fiscal revenues varies according to the natural-resource endowment and the institutional arrangements in place to organize the different countries' social security systems. At one extreme, over the past two decades the two sources have accounted for between 30 and 45 percent of total revenues in Bolivia, Chile, Trinidad and Tobago, and Mexico. At the other extreme are Costa Rica and Uruguay, where the resources of private social security accounted for about 2 percent of total fiscal income over the same period.

In the middle are Panama, Paraguay and Peru, where contributions were in the range of 12 to 17 percentage points of total state revenue between 1990 and 2010. These cases illustrate the difficulty that arises when the public accounts of different countries are compared without taking account of those countries' characteristics. Hence the need for an additional effort to determine a country's fiscal revenues, both from the perspective of the resources available to the state and from the viewpoint of the effort demanded of citizens.

4.1 Information Source: IDB/CIAT Database

The concept of *Equivalent Fiscal Pressure (EFP)* was devised to address this situation. The EFP comprises tax revenues, net income from the exploitation of natural resources that are transferred to the public treasury, and contributions to finance the social security system that is not part of general government.

At the moment, the EFP database holds information on 21 LAC countries for the period 1990–2010: Argentina, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, and Uruguay.³⁵

The database offers significant advantages to anyone interested in analyzing revenue in these countries, which account for more than 90 percent of the region's GDP. First, as mentioned earlier, EFP is the most adequate concept to quantify LAC countries' fiscal burden, since it includes income from natural-resource exploitation and compulsory contributions to privately run social security. Second, the database includes information on the different levels of general government (that is, the national and subnational levels). Moreover, an effort has been made to include information on the Caribbean (Barbados, Dominican Republic, Jamaica, and Trinidad and Tobago).³⁶

Finally, we want to underline that the EFP approach is not meant to spark a dispute with other definitions used to analyze LAC economies. On the contrary, it was devised to respond to the need to reflect the structural aspects and institutional arrangements of the region's economies, adding income from these sources to the tax revenues that are traditionally considered in analyses of the countries' fiscal accounts.

³⁵ The database can be accessed at: <http://www.ciat.org/index.php/en/products-and-services/ciatdata/collection.html>.

³⁶ Garcimartín (2012).

4.2 The Legal Basis of the Equivalent Fiscal Pressure

While EFP has its economic motivations, it also has an institutional legal aspect. Any state can exercise different forms of power or coercion over its subjects; this is how its sovereignty mainly manifests itself. This coercion ranges from the “exercise of legitimate violence” (Weber, 1919)—for example, evicting someone from a property that he or she is occupying illegally—to imposing requirements (or obligations) on its residents. Some are pecuniary requirements (such as taxes, and others that we will consider below), and others are not (such as the obligation to enroll children in school).

Focusing on coercive pecuniary obligations imposed on citizens, we can discern at least three different forms of the exercise of sovereignty in this area: (a) the authority to tax; (b) the capacity to obtain revenue from the public domain; and (c) legal or regulatory obligations to do or not do certain things involving a payout. Let us consider each of these:

- a) **The authority to tax:** this is the traditional category that covers taxes, user fees and contributions.
- b) **The capacity to obtain revenue from the public domain:** while the concept and categories of the public domain are very broad, and they vary in line with the different legal frameworks, in general they all reserve for the state some degree of authority or ownership control over natural resources. Use of the latter can range from exclusive state exploitation of the resource to giving the private sector sole exploitation rights, and can include intermediate approaches such as exploitation by mixed enterprises.

Whatever the form of exploitation, it is usual to tax the windfall stemming from it, and there are sound public-finance reasons for the state to ensure that the earnings benefit the whole of society and even future generations. But what is interesting here is that the exploitation spawns ad hoc public revenues such as royalties, special duties, windfall taxes and so on. They have a wide range of names and purposes, and in the final analysis we are talking about new public revenues that the state can use as it sees fit.³⁷

- c) **Legal or regulatory obligations to do or not do certain things involving a payout:** This category includes compulsory contributions to social security, mostly healthcare and pensions, managed by the private sector. This was mentioned in a recent US Supreme Court ruling on the Patient Protection and Affordable Care Act.³⁸ They are obligations that comprise a pecuniary and coercive requirement covering the “tax” category of our classification, because of their unquestionable proximity to traditional forms of tax.

³⁷ So, for example, many of these instruments seek the subnational redistribution of wealth.

³⁸ Opinion 11-393 of June 28, 2012, <http://www.supremecourt.gov/opinions/11pdf/11-393c3a2.pdf>.

Nonetheless, it is fair to acknowledge that their originating authorities are different (tax authority versus regulatory authority³⁹).

Box 1. Patient Protection and Affordable Care Act: Supreme Court of the United States and the Bases of EFP

The US Supreme Court's opinion 11-393 on healthcare reform (Patient Protection and Affordable Care Act, 2010) has entailed a significant doctrinal innovation in the notion of taxation. The opinion rules that the obligation to acquire health insurance (individual mandate), a legal obligation that involves paying a penalty in the event of failure to acquire such insurance, is constitutional in light of the power of Congress to levy taxes ("the individual mandate may be upheld as within Congress's power under the Taxing Clause").

The reasoning is as follows: the ruling determines that, constitutionally speaking, payment of a penalty (which the law alternatively calls a "shared responsibility payment" and a "penalty") has the nature of a federal tax by virtue of its function and its means of collection. Hence the conclusion that the constitutionality of the obligation to acquire health insurance (the individual mandate) can also be based on the power to levy taxes enshrined in the constitution.

In conclusion, in constitutional terms this regulatory measure can be likened to a tax and therefore a computable element of EFP from the date it enters into force. It is important to note that, according to our estimates, compulsory health insurance will reach 3.1 percent of GDP, entailing a 12 percent increase over the traditional fiscal pressure of 2010.

³⁹ A historical analysis of the different origins of power of the State is not the objective of this article. It would probably be difficult to directly associate regulatory and tax power with powers described and established in the past, whether it be the Roman Empire, the Middle Ages, or the Enlightenment, to give three possible historical references. Among other factors, this is due to the fact that the sovereign invested with this power, and its characteristics, changed during each of these historical periods. Studying one of the most deep-rooted Western legal traditions – Rome – it can be affirmed that regulatory power is very close to the Roman *potestas*, understood as an executive power (the Magistrate in Rome), through which civil life was organized. Meanwhile, the power to tax was ontologically different (and probably originated in the power of the imperium). Moreover, the practical application of this power was derived from the *auctoritas* (Senate or legislative power), and therefore, was a hybrid of the two forms of authority (*potestas* and *auctoritas*). In this regard, independent of what the U.S. Supreme Court says, it remains clear that both functionally and legally there are differences between the power to levy taxes and the power to regulate aspects of a society's civil and commercial life.

5. Summary and Conclusions

Over the last two decades development standards and the role of the State have been revised for most of the countries in the region. As a result, and also because of changes observed in the international economy, Latin American and Caribbean countries have seen great economic, social and institutional transformations. The tax system has not remained untouched by these transformations. In the last ten years most of the countries analyzed registered important tax burden increases, after significant streamlining in the mid-90s. During this process, the neutrality of economic decisions prevailed in the tax system, as did simplicity in its administration.

These increases were complemented by considerable increases in revenue derived from the exploitation of natural resources, which benefited from the best terms of trade for raw materials seen in decades. On the other hand, changes introduced in pension system funding had an enormous fiscal impact. In this sense, various countries in the region progressed from a pay-as-you-go system administered by the State to a mixed system in which obligatory contributions to individual capitalization accounts administered by private pension funds complemented minimum pensions with public guarantees.

These three sources, taxation, revenue derived from natural resources, and financing of the social security system, constitute the Equivalent Fiscal Pressure or EFP. In our opinion, the EFP and its three components currently constitute the most adequate indicator for analyzing the tax burden of Latin American and the Caribbean and for making international comparisons. This is because the EFP takes into account the diversity of revenue sources and institutional arrangements in LAC, by which the fiscal revenues available to a State can be quantified, and recognizes the fiscal effort demanded from the State's citizens. Conceptually, the EFP should be applied to calculate the tax burden in all economies where these conditions are observed.

While the EFP concept presents differences with respect to those adopted by other multilateral entities, it should be considered their complement, allowing more precise reflection of the reality of the region and, possibly, that of other countries where natural resources play an important role in the economic structure. We will now discuss the main facts observed.

The first characteristic of the EFP in LAC countries is that this measurement presents wide variability in terms of its level, compositional structure, and changes to this structure over the last two decades. A group of countries headed by Brazil, and including Argentina, Bolivia, Chile, Trinidad and Tobago, and Uruguay, have a high EFP at between 28 and 34 percent of GDP. The percentages are comparable to, and in some cases higher than, the weighted average values for the OECD. Another group, with income in the range of 20 to 25 percent of GDP, includes Jamaica, Colombia, Costa Rica, Ecuador, Mexico and Panama. The third group includes several Central American countries, the Dominican Republic, Paraguay and Peru, where the average EFP was in the range of 14 to 19 percent of GDP in the period 2006–2010. It should be noted that this study does not seek to assess the optimum level of the EFP or the quality of its composition.

Secondly, analysis of the EFP reveals that fiscal revenue increased significantly in all of the region's countries over the past two decades. Increases in the EFP, in GDP terms, were led by Bolivia, Colombia, Argentina and Ecuador (between 70 and 90 percent), followed by El Salvador, the Dominican Republic and Guatemala (between 40 and 45 percent, albeit from very low bases). The increases in Brazil, Barbados, Belize, Costa Rica, Trinidad and Tobago and Uruguay were also significant (between 15 and 30 percent), given that most of these countries started with higher values than the countries mentioned above. Single-digit increases in the EFP are apparent only in Chile, Mexico and Panama, but even here the rate is fairly high at between 8 and 9 percent.

The increase in the EFP is closely linked to the rise in commodities prices that has been evident over the past decade and gave impetus to the fiscal effort. The direct effect stems from the income from natural-resource exploitation. The indirect effect springs from the impact of the terms of trade on economic activity, and hence on countries' level of collection. The future development of the EFP and the fiscal effort will depend on international commodities prices.

In the fourth place, these increases have allowed some countries to attain levels similar to the average of the OECD countries, a circumstance that would have been unthinkable 20 years ago. There has been an upward **convergence** of the EFP. Even in countries with a much lower EFP than the OECD average, the increases mentioned above allowed them to be part of the convergence process.

Nonetheless, differences persist in nominal terms owing to the lower per capita GDP of LAC economies. Thus, average collection (weighted) per inhabitant in the OECD for the period 2006–2010 was almost 6 times higher than the LAC average. Portugal's revenue collection in dollar terms—Portugal's income being below the OECD average—is two and a half times the (weighted) average of MERCOSUR, three of whose four members have among the highest per capita incomes and tax burdens in Latin America (Argentina, Brazil and Uruguay). Portugal's tax burden, however, was lower than MERCOSUR's in the period 2006–2010, even though its economy suffered a severe crisis during that time.

In fifth place, regarding the composition of tax revenues, there was a sharp increase in direct taxes (income tax, property tax, simplified regimes and financial transaction tax) throughout the period. Despite this rise, the amount collected through these instruments was far from the potential take, particularly for personal income tax. In a continent marked by a high degree of income concentration, it is crucial to increase the share of personal income tax in the total.

On the contrary, VAT tax collection in the majority of countries analyzed compares favorably with the average of those countries that make up the OECD. Over the last two decades, the VAT has become one of the pillars of tax collection, corresponding with the modern tax system. The flipside of this has been the relatively lesser importance of excise taxes, limited to the taxation of goods with negative health and environmental externalities, and those than tax foreign trade. The case of Argentina has been the exception to the rule, as it re-introduced export taxes following the collapse of the convertibility system.

The seventh observation refers to subnational taxes, which have not seen significant changes over the past two decades. Subnational takings are a modest share of the total, except in Brazil (9.6 percent of GDP) and, to a lesser extent, Argentina (5.6 percent). Even so, the main subnational taxes in both countries—respectively, the subnational VAT and the gross income tax—are inadequate from the viewpoint of tax system design. Almost everything remains to be done in the field of subnational taxation.

The eighth conclusion concerns revenues that finance social security. In this case, the experience of countries studied that allow for private management of compulsory contributions to social security regimes covering health and retirement services, suggested the suitability of moving away from the traditional method of handling this matter in the statistics. It should be noted that in the future, fiscal burdens of 5 to 8 percent of GDP—as recorded in Argentina, Brazil, Chile, Costa Rica, Panama and Uruguay—might be insufficient to finance the social security system, given the ageing of the population and the epidemiological transition in which chronic diseases will predominate. Note that the other countries in this study will have to make greater effort than is currently the case to finance the system, as their societies demand minimum standards of wellbeing for pensioners.

The ninth reflection relates to income from the exploitation of natural resources. Its availability may have deterred the effort of the governments of Mexico, Panama, and Trinidad and Tobago from levying taxes, in contrast to what happened in Bolivia and Ecuador. This is often apparent in economies afflicted by what the literature calls the “resource curse.” This is the case in Mexico and Panama (countries with a relatively low EFP of about 20 percent of GDP) as well as Trinidad and Tobago, where the EFP is 12 percentage points higher. The concern is not only for the possible tax-deterrent effect that natural resources might have had, but also that in both Mexico and Trinidad and Tobago these are non-renewable resources whose main oil and gas fields are in decline, while the new sources will require the use of substantially more expensive technologies.

The last observation corresponds to the modernization of the tax administration system, which has played a determinant role in obtaining the results here analyzed. Over the last twenty years, tax administrations of the region abandoned organizational structures by type of tax, replacing them with others that ranged from structures centering on functions and later to those which revolve around the client (taxpayer) segmentation. Of these structures, the latter currently prevails. For the majority of the tax administrations, the greater budgetary and technical autonomy that accompanied the institutional strengthening process has been apparent in the widespread adoption of technology. These agencies have taken advantage of information technology progress made over the last two decades and have been at the forefront of electronic government in their respective countries.

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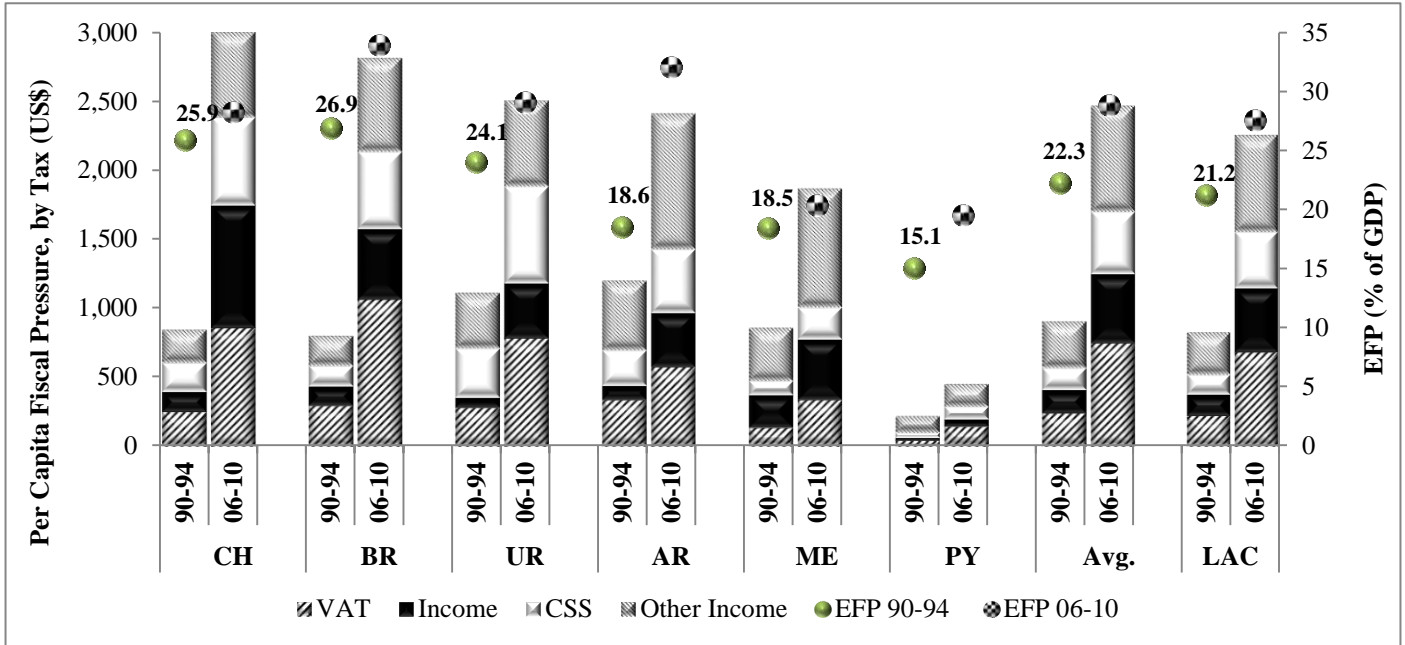
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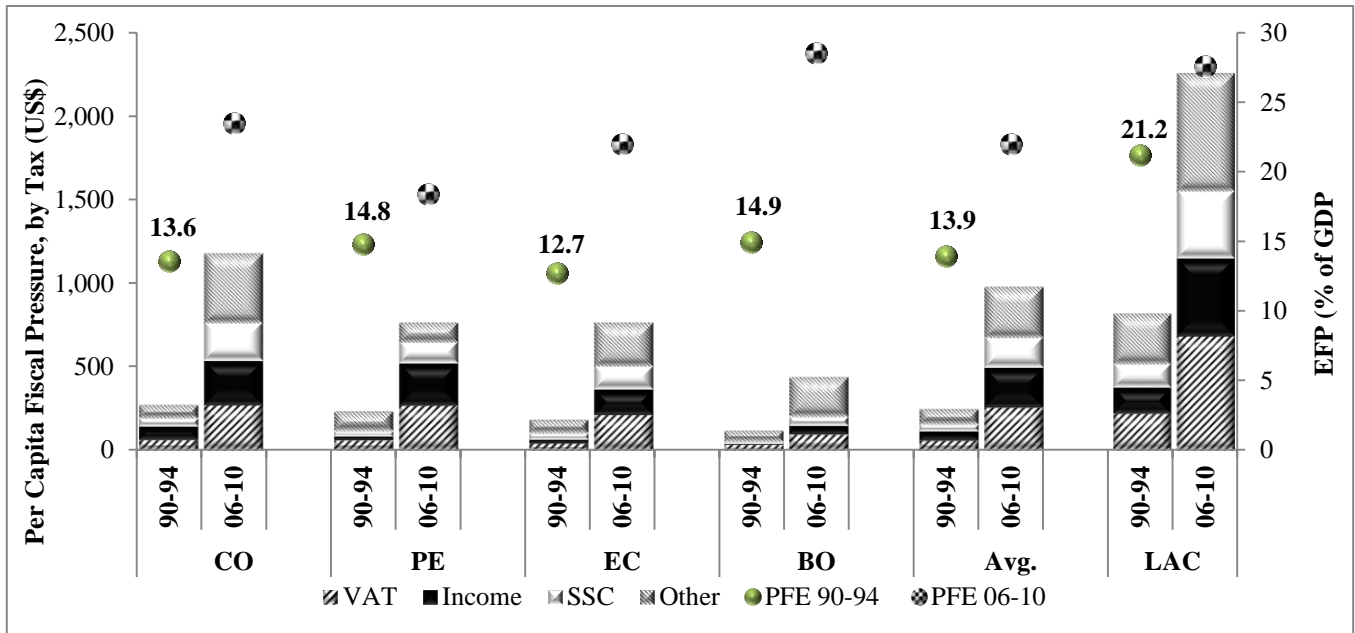
Annex 1

EFP Per Capita by Tax and as % of GDP^{1/}

Mercosur and Mexico



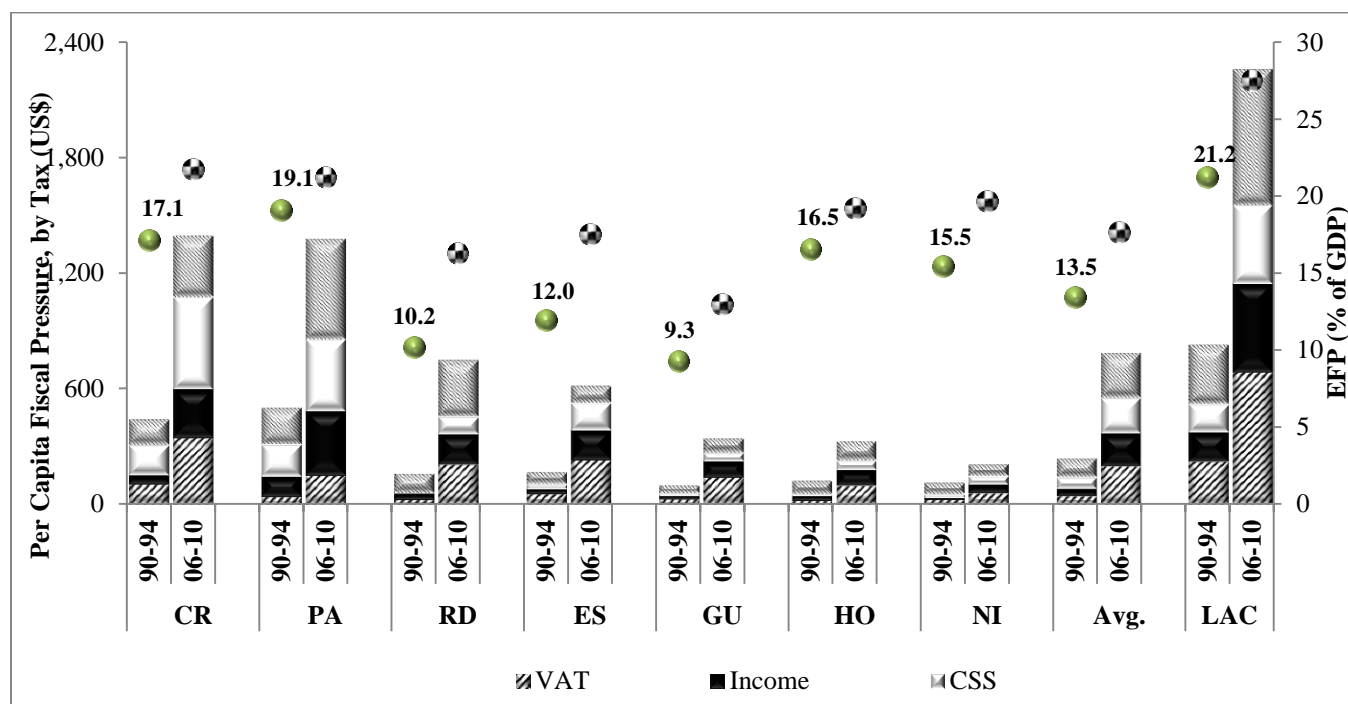
Andean Community



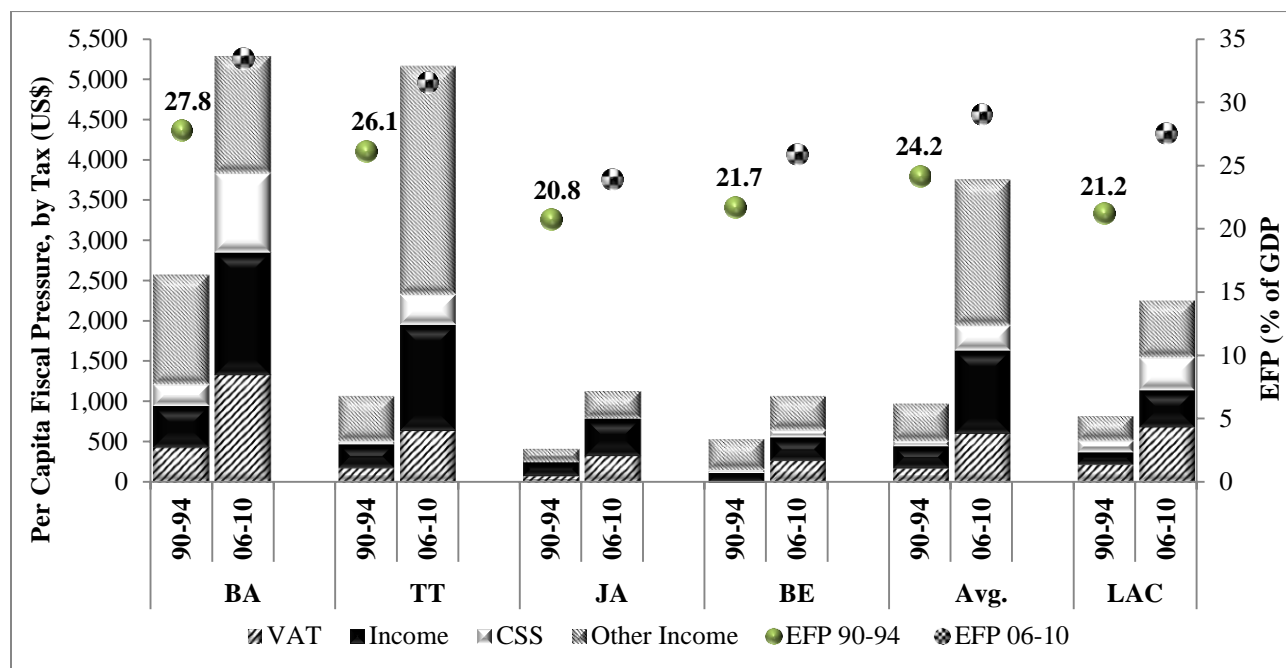
Source: IDB-CIAT (2012), WEO

1/ Averages weighted by the GDP of each country

Central America, Panama and the Dominican Republic



Caribbean

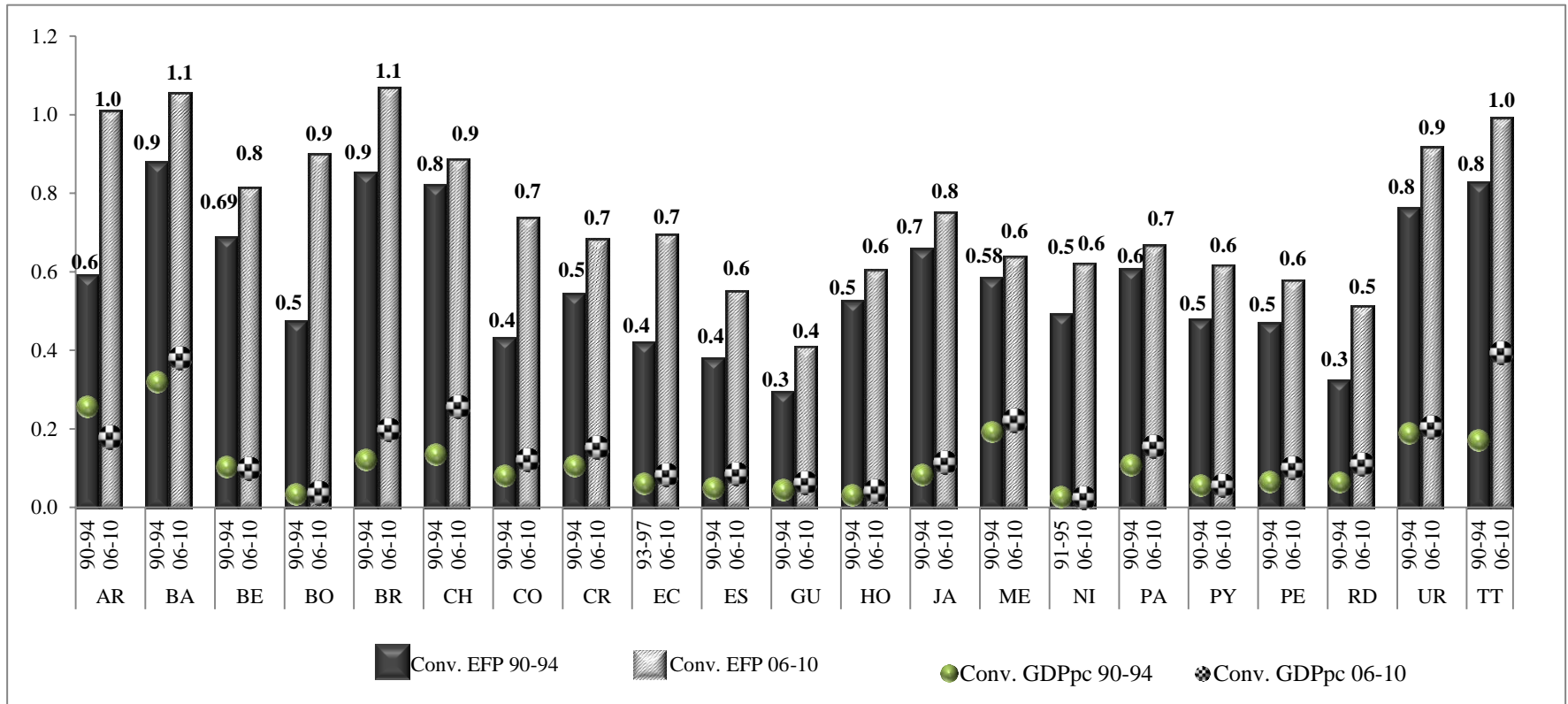


Source: IDB-CIAT (2012), WEO

1/ Averages weighted by the GDP of each country

Annex 2

Convergence of EFP and Per Capita GDP with OECD^{1/2/}



Source: IDB-CIAT (2012), WEO

1/ / Average fiscal pressure and per capita GDP weighted by GDP in current dollars of each country. 2/ For Ecuador and Nicaragua, information from 1993 and 1991 onwards, respectively.