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America**

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# **Tax Morale and Tax Evasion in Latin America**

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## **Abstract**

It is hard for tax administrations to levy and collect taxes anywhere and any time. However, taxing certain kinds of activities, sectors, or individuals – the so-called “informal sector” – is an additional challenge for tax administrations in both developing and developed countries, and the “fiscal gap” that arises from the failure to tax this sector can be quite large. This issue is especially pressing in Latin America and Caribbean (LAC) countries, where often over half of the workforce is found in the informal sector. In this paper we examine taxation and tax compliance in LAC countries – and beyond – focusing on several main questions. What is meant by the “informal sector”? What is the size of informal sector in LAC countries? What are some effects from an informal sector, including the size of the “fiscal gap”? What are the reasons for this fiscal gap? What can be done to address these various issues?

## **1. Introduction**

It is well accepted that most people do not like to pay taxes, and, because of this fundamental reason, it is hard for tax administrations to levy and collect taxes anywhere and any time. However, taxing certain kinds of activities, sectors, or individuals – the so-called “informal sector” – is an additional challenge for tax administrations in both developing and developed countries, and the “fiscal gap” that arises from the failure to tax this sector can be quite large.

Even aside from the collection of additional tax revenues from taxing those in the informal sector, there are other important tangible effects that arise from taxing the informal sector. One benefit is an improvement in horizontal and vertical equity. Another is an increase in economic efficiency. There are also significant intangible effects, including higher overall “tax morale” – or citizens’ intrinsic motivation to pay taxes – in the country. If there is a growing sense of the inability or unwillingness of tax authorities to catch tax evaders, the resulting unfairness of relative tax burdens could potentially lead over time to much lower tax yields than the lower tax yields due directly to the failure to tax this sector. This issue is especially pressing in Latin America and Caribbean (LAC) countries, where often over half of the workforce is found in the informal sector.

In this paper we examine taxation and tax compliance in LAC countries and beyond, focusing on several main questions. What is meant by the “informal sector”? What is the size of informal sector in LAC countries? What are some effects from an informal sector, including the size of the “fiscal gap”? What are the reasons for this fiscal gap? What can be done to address these various issues? We begin with an overview of the tax systems of LAC countries.

## **2. Basic structural features of LAC tax systems**

The basic structural features of LAC tax systems, as represented by the structure of personal income taxes (PIT), corporate income taxes (CIT), and value-added taxes (VAT) or other general consumption taxes, are presented in Tables A-1 to A-3 in the Appendix. These tables show a great variety of approaches as to what is taxed, what is exempted, what are the rate structures, and so on.

In the case of the PIT there are many quite varied approaches. For example, Bolivia has a flat rate tax of 13 percent, while Colombia has a multiplicity of progressive rates (132 in all) ranging from 0.26 percent to 35 percent and Chile similarly has a very progressive schedule with 8 brackets and minimum and maximum rates of 5 percent and 40 percent, respectively. In the area of exemptions, most forms of income from capital are exempt in Argentina (although Argentina imposes a wealth tax on gross asset values with rates ranging from 0.5 percent to 0.75 percent), while most other LAC countries tax capital income, even though realized capital gains are often either fully or partially exempt. Other forms of diversity in personal income taxation are provided by Mexico's important low income tax credit, which no other country in the LAC region has, or the fact that several countries provide partial or total credit for VAT paid.

There is more uniformity in the structure of the CIT, in income determination and allowable deductions, but even here the rates imposed range considerably, from 10 percent to 38.5 percent. In the case of the VAT, most LAC countries operate with a single rate, but again there are significant differences in rates, ranging from 5 percent in Panama to 23 percent in Uruguay. Although most countries zero-rate exports, there are wide differences in the scope of exempted commodities.

Diversity in tax structure is accompanied also by diversity in typical tax processes (e.g., time spent preparing taxes, number of payments for tax purposes, and so on), the overall level of

taxation as percent of GDP, and the composition of tax revenues (e.g., the direct/indirect tax revenue shares).

There is also diversity across LAC countries by size of GDP, its composition, and the level of GDP per capita. Information on these variables is presented in Appendix Table A-4. For example, in the number of payments that the average taxpayers has to make, the average for the region is 41, but it is as high as 68 in the case of Colombia and as low as 8 in the case of Ecuador. The average business spends 430 hours in filing and paying taxes, but again here there are wide variations, with 2600 hours in Brazil to 224 hours in El Salvador and 198 in Suriname.

The average ratio of tax revenue to GDP in LAC countries is relatively low (as we discuss in more detail later), at 11.85 percent as an average in the period 1995-2005. This figure is fairly representative of the countries in the region, but there are some outliers. For example, the tax revenue to GDP ratio was as high as 17.80 percent in Uruguay and as low as 9.54 in Guatemala.<sup>1</sup>

On average, taxes on domestic good and services are twice more important, as a percent of total revenues, than taxes on income, profits, and capital gains. This relatively heavier reliance on indirect domestic taxes is likely to make the tax systems more regressive. Of course, there are again significant variations across countries. The share of indirect domestic taxation in total revenues is 58 percent in Mexico and 56 percent in Guatemala but as low as 9 percent in Panama. Many countries in the LAC region still rely quite significantly on taxes on international trade, which are likely associated with significant distortions in the allocation of productive resources. For example, Argentina received on average in the period 1995-2005 over 15 percent of its revenues from taxes on international trade.

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<sup>1</sup> Although the ratio of tax revenue to GDP changes over time for some countries, it is possible to divide the LAC countries into three categories of relatively high, intermediate, and relatively low ratios. Gomez Sabaini (2005) categorizes as relatively high ratio countries Brazil, Uruguay and Argentina; as relatively low, Paraguay, Mexico, Ecuador, Venezuela, Guatemala, and Haiti; and as intermediate all other countries in the region.

It is important also to emphasize the diversity in income levels across LAC countries. GDP per capita in Argentina on average over 1995-2005 was close to \$12,000, while in Bolivia per capita GDP was \$2,400 and was \$3,210 in Nicaragua. However, both Bolivia and Nicaragua had during that period a significantly higher tax revenue to GDP ratio than Argentina. The composition of GDP, which likely affects the ability to raise taxes and the overall elasticity of tax revenues, also differed markedly across LAC countries; for example, value added from agriculture was only 6.18 percent in Chile and 7.02 percent in Argentina while it reached 23.16 in Guatemala and 24.20 percent in Paraguay.

Given the existing tax structures as stated in the tax laws and economic environments of each of the countries in the LAC region, the actual level of tax revenues raised in each country depends on the ability and willingness to administer the existing taxes. There is some evidence that the overall effectiveness in using the existing tax structure differs significantly across LAC countries. For example, as shown in Table 1, the VAT productivity, defined as the yield of each percent point of the VAT rate as a share of GDP, ranges from a high of 0.64 in Chile to a low of 0.17 in Guatemala. Although some of the differences in productivity are probably linked to different structures of the VAT, especially the structure of exemptions, Chilean tax administration practices would appear to be over three times more effective than those in Guatemala in raising VAT revenues.

**Table 1. VAT Productivity for 17 Latin-American Countries**

<b>Country</b>	<b>VAT or GST Rate<sup>a</sup> (2006, as percent)</b>	<b>VAT Productivity<sup>b</sup> (as percent of GDP)</b>	<b>Last Period of Available Information<sup>c</sup></b>
Argentina	21%	35%	2004
Bolivia	15%	21%	2004
Brazil	15%	43%	2004
Chile	18%	64%	2004
Colombia	16%	26%	2003
Costa Rica	13%	38%	2004
Dominican Republic	12%	18%	2003
Ecuador	12%	54%	2003

Guatemala	12%	17%	2004
Honduras	12%	45%	2002
Mexico	15%	24%	2004
Nicaragua	15%	20%	2003
Panama	5%	30%	2003
Paraguay	10%	49%	2004
Peru	19%	35%	2003
Uruguay	23%	43%	2004
Venezuela	14%	47%	2004

<sup>a</sup> The rate corresponds to the highest rate defined in the law. Only Brazil has defined different VAT rates, between 10 percent and 15 percent.

<sup>b</sup> “VAT Productivity” is defined as the yield of each percent point of the VAT rate, expresses as percent of GDP.

<sup>c</sup> The most recent available information on VAT collections is limited to 2004 and, in some cases, 2003 and 2002. The GDP used to compute the VAT Productivity coefficient corresponds to the same period, but the VAT rate is the one in place on 2006. Some inaccuracies can be observed for those countries where the VAT rate has changed over the last years.

Sources: For general consumption tax collections in 2002-2004 (current US\$ millions), Centro Interamericano de Administraciones Tributarias (CIAT); for GDP in 2002-2004 (current US\$ millions), World Marketing Data & Statistics; for the VAT or GST rate, PricewaterhouseCoopers’ Worldwide Tax Summaries online (December 2006).

A conventional way to look at the performance of tax systems is to ask whether the country’s tax effort is “in line” with other countries of the same level of development and general economic characteristics. Although it is clear that there is no definitive way to establish how high taxes should be in a country, the comparison with international practice allows us to know how far a particular may be below or above the “international norm”. If the level of such “tax effort” is low relative to the international norm, this would be an indication that less than the adequate level of public services and infrastructure may be being provided and that tax effort could increase without appearing to be a “high tax” country to potential foreign direct investors.<sup>2</sup>

However, as we have seen repeatedly in the discussion above, different countries may differ in their ability to collect taxes because of different economic structures. To control for these difference, regression analysis is typically used to estimate the average capacity to collect taxes for a sample of countries, controlling for GDP per capita and other proxies for the ability to

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<sup>2</sup> Of course, there are many factors other than taxes that have been shown to affect foreign direct investment. The quality of a country’s governance institutions, low levels of corruption, the quality and skill levels of the labor force and infrastructure, and other factors have been shown to be as important, if not more important, determinants of foreign direct investment flows than taxes. Even so, many of these other determinants depend heavily on the ability of a country to generate adequate revenues.

collect taxes such as value added in agriculture as a share for GDP. These regressions are then used to generate the level of *predicted taxes* that on average each country would be able to collect, given the per capita income and other characteristics of the given country. A comparison of *actual taxes* of the country versus its *predicted taxes* then gives a measure of “tax effort”. If actual taxes are greater than predicted taxes, then the country is said to have a relatively high tax effort; if actual taxes are less than predicted taxes, then tax effort is relatively low.

In order to sort out the level of tax effort exercised in the different LAC countries, we use the regression analysis approach. The dependent variable in these regressions is taxable capacity as measured by the ratio of actual tax collections to GDP. This measure of taxable capacity is regressed on several proxies for the composition of the tax bases and the ability to collect taxes. From the estimated equation, a predicted value of the tax collections to GDP ratio is obtained, that is, the amount the country could collect if it exerted an “average” tax effort. We then calculate the effective level of tax effort as the ratio of actual to predicted taxes, expressed relative to GDP.

There are many different specifications that can be used in estimating tax effort across countries. Here we have estimated tax effort for two different periods: the 1990s and the 2000s (through 2005), using a simple specification that has worked well in numerous previous studies on this issue. Our specification includes as explanatory variables per capita GDP in U.S. dollars (which proxies for a greater ability to collect taxes), the ratio of the sum of exports plus imports to GDP as a positive and favorable “tax handle”, the ratio of agricultural value added to GDP as a negative and unfavorable tax handle, and the rate of population growth. All these variables have shown to be mostly significant in this type of previous studies.

The model estimated has the ratio of tax collections to GDP as the dependent variable, and includes as explanatory variables per capita GDP (in U.S. dollars), the ratio of the sum of exports plus imports to GDP, the ratio of agricultural value added to GDP, and the rate of growth

of population.<sup>3</sup> The regression results are reported in Table A-5 in the Appendix, and the implied tax effort results (denoted “Index”) for LAC countries are reported in Table 2. (More detailed, alternative regression results are presented later in several other tables.)

**Table 2. Tax Effort in Selected LAC Countries in the 1990s and early 2000s**

Country	Average 1990s			Average 2000-2004		
	Actual	Forecast <sup>a</sup>	Index <sup>b</sup>	Actual	Forecast <sup>a</sup>	Index <sup>b</sup>
Argentina				12.176	15.297	0.796
Belize	19.819	17.119	1.158			
Brazil	10.995	16.246	0.677			
Chile				16.285	16.242	1.003
Colombia	12.039	17.123	0.703	13.148	14.231	0.924
Costa Rica	13.479	17.337	0.777	13.020	16.308	0.798
Dominican Republic				15.143	16.443	0.921
El Salvador	22.741	19.273	1.180	10.967	15.195	0.722
Grenada						
Guatemala	8.165	13.82	0.591	10.159	13.445	0.756
Jamaica	23.541	19.446	1.211	24.507	17.447	1.405
Mexico	11.041	17.536	0.630	11.650	16.159	0.721
Nicaragua	16.149	14.549	1.11	14.104	14.727	0.958
Panama	12.155	21.440	0.567	9.730	17.939	0.542
Paraguay	9.984	14.871	0.671	9.974	14.109	0.707
Peru	12.616	16.296	0.774	12.624	14.141	0.893
Trinidad and Tobago	22.440	19.984	1.123			
Uruguay	17.822	17.355	1.027			
St Kitts and Nevis	19.805	20.949	0.945	23.480	17.787	1.320
St Vincent and the Grenadines	22.286	19.182	1.162			
Venezuela	14.279	17.601	0.811	11.888	15.041	0.790

<sup>a</sup> The forecast values are based on OLS regressions using data from World Development Indicators, World Bank (2006). Due to missing data, only 105 countries (out of 219) are used for the 1990s regression, and 98 countries for 2000-2004 regression. The regressions are reproduced in the Appendix, Table A-5.

<sup>b</sup> The index is calculated as actual taxes (as a percent of GDP) divided by forecast revenues (as a percent of GDP).

The data used for the estimation are from the International Monetary Fund’s *Government Finance Statistics Yearbook* and the World Bank’s *World Development Indicators*. Due to missing data, only 105 countries (out of 219) are used for 1990s regression, and 98 countries for the 2000s regression. By estimating tax effort over time, we are less likely to draw inferences based on the impact of conditions in a single year. The most significant explanatory power is

<sup>3</sup> This variable has been used in recent tax effort studies under the rationale that higher population growth tends to generate expansions in tax bases.

displayed by the tax handles as proxied by the ratio of imports plus exports to GDP and the ratio of agricultural value added to GDP.

The results for tax effort in Table 2 show that, with the general exception of the Caribbean area, tax effort in LAC countries is below par, extrapolating from the international experience. There are some significant variations, however. For example, Chile and Nicaragua are close to an average international tax effort, but countries like Guatemala and others are well below the expected international norm. From the figures, there appears to be a generalized increase in tax effort in LAC countries between the 1990s and the 2000s.

There can be multiple causes behind the relatively low tax efforts. First, the overall buoyancy of the tax systems may have been low over time; low buoyancies may be induced, for example, by tariff/trade reforms and subsequent difficulties in recovering the revenue losses from the customs tariff with domestic taxes.<sup>4</sup> A second source of difficulties, which is further developed below, is the existence of sizable underground economies and informal sectors. Third, and relatedly, the overall level of tax compliance could be low because of a high level of tax evasion and a poor performance of the tax administration. Fourth, tax policy itself can contribute to lackluster collections by allowing excessive deductions and exemptions in the major taxes. Fifth, different tax systems show different abilities to adapt to the changes in economic structure. In many countries the area of services continues to expand while manufacturing shrinks, but service firms are more difficult to tax than manufacturing businesses. Sixth, the overall level of tax effort in a country also depends directly on the revenue performance of sub-national governments, when these jurisdictions are charged with raising their own revenues and have some degree of discretion in doing so. Seventh, there may be political

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<sup>4</sup> This issue has been recently examined by Baunsgaard and Keen (2005) and Glenday (2006). These studies find, based on the analysis of central government tax collection data for a large number of developing countries and for a period of almost three decades back, that on average low-income countries recovered at best less than one-third of the losses from taxes on international trade through increased domestic taxes. In contrast, middle-income countries recovered around half of those tax losses, and high-income countries had no problems replacing the revenue losses.

reasons for keeping the level of tax effort more or less constant.<sup>5</sup> Bird, Martinez-Vazquez, and Torgler (2006) argue that countries may tend to achieve an equilibrium position with respect to the size and nature of their fiscal systems that largely reflects the balance of political forces and institutions, and that countries may leave that position only after a significant institutional shock.<sup>6</sup>

The taxation performances in LAC countries, partial and in many ways unsatisfactory as they are, suggest several general patterns:<sup>7</sup>

- Relatively low levels of taxation in most LAC countries are not a recent phenomenon. Over the last few decades taxes have not gone up in LAC countries. Although some rates have risen, mainly for the VAT, other rates (mainly for income taxes) have declined, leading to little changes in tax effort.
- National patterns of taxation have been persistent over time. Countries that had relatively high taxes at the end of the 1970s continue to be above the regional average in the 1990s and 2000s, and countries that depended more on income than on consumption taxes continued on the whole to do so over the decades.
- Despite the relative constancy in both tax levels and composition of tax structures across and within countries, many changes have taken place in tax policy across LAC countries over the last few decades. Economic and political circumstances have changed dramatically at times in some countries, and sometimes tax systems have changed with them.

### **3. Weak tax enforcement capacity and corruption in the LAC region**

Although the data are not generally available to know with certainty, there appears to be a generalized weak enforcement capacity in the LAC region, especially with regards to audit systems that tend to be outdated and underfunded. There is more recent survey information that tax administrations in LAC countries also suffer from corruption and bribery problems, and that

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<sup>5</sup> See Martinez-Vazquez (2001) for a discussion of Mexico's tax-GDP ratio constancy over time. Similar relative constancy can be seen in other countries (e.g., Colombia) over the decades despite repeated tax reforms (McLure and Zodrow, 1997). Lledo, Schneider, and Moore (2003) and Bird, Martinez-Vazquez, and Torgler (2006) emphasize the role of political institutions, especially those that enhance legitimacy and representation, in explaining tax effort across countries in the LAC region.

<sup>6</sup> For example, in Nicaragua after the Sandinista government took over, the tax to GDP ratio rose very quickly in the first 5 years of the regime, from 18 to 32 percent of GDP, with the increase mostly coming from (regressive) indirect taxes. Nicaragua has maintained a relatively high level of tax efforts many years and several subsequent governments after the Sandinistas had left government.

<sup>7</sup> See the discussion in Bird, Martinez-Vazquez, and Torgler (2006).

the prevalence of some of these problems is worse in the LAC region than in other regions of the world. Before we look at what evidence there is on enforcement capacity, we discuss some of the survey evidence on corrupt practices in tax administration.

Table A-6 in the Appendix presents recent survey evidence of significant levels of bribery in tax administration practices across LAC countries, and also some indirect evidence on underreporting and evasion. These data are based on the World Bank's Enterprise Surveys 2005-2006. On the existence of underreporting, the average for the sample of LAC countries represented in Table A-6, indicates that the sales amount reported by a typical firm for tax purposes was just above three-fourths of "true" sales; however, there were significant differences across countries, with the typical firm in Chile reporting over 98 percent of sales, while that figure was 67 percent in Brazil and 66 percent in Nicaragua. By comparison to other regions of the world, only countries in East Asia and the Pacific average a lower percent of sales reported; notably, the survey reveals a slightly higher percent of sales reported in Sub-Saharan Africa countries than in the LAC region (see Table A-7 also in the Appendix).

On the presence of bribery in tax administration practices, the World Bank's Enterprise Survey asks questions such as the practice of "paying bribes to get things done" or "firms expected to give gifts in meetings with tax inspectors." The results by country in Table A-6 show significant variations across LAC countries. In general corrupt practices have a higher presence in LAC countries vis-à-vis countries in other regions of the world (Table A-7).<sup>8</sup>

Despite the data limitations, there is evidence that LAC countries are far from homogenous in their ability to collect taxes. This theme is well developed in Bergman (2003), who compares the success of Chile and the failure of Argentina to collect taxes over the past several decades. These two countries differ considerably in their ability to enforce taxes. As

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<sup>8</sup> The World Bank's Enterprise Survey provides more detailed information on some of the questions asked by type of firm. See Table A-8 for information by the type of firm spent in meetings with tax officials and Table A-9 the firms that were expected to give gifts in meetings with tax inspectors by type of firm.

reported by Bergman (2003), tax evasion in Argentina is close to twice that in Chile, although the tax structures and the tax administration apparatus of the two countries are roughly similar.

In Bergman's view, factors beyond tax administration capacity determine the different levels of compliance in both countries; that is, compliance is a direct function of how able governments are to create a permanent credible threat of being caught and punished. Since the 1970s both Argentina and Chile have undergone the modernization of their tax administration agencies, involving collection and audit schemes and other measures of "punitive capacity". Where these two countries have differed, argues Bergman, is in the ability of the government in the two countries to sustain these reforms over time and to "...build a strong and autonomous tax administration capable of deterring tax evaders" (Bergman, 2003, 613.) Chile has been successful, while Argentina and other major countries in Latin America (e.g., Colombia, Mexico, Peru, Bolivia) have not been successful at creating improved tax compliance on a sustained basis.

Bergman (2003) emphasizes that the different performances of Chile and Argentina lie in the very significant disparities in the subjective perception of being caught cheating in both countries, and ultimately in the credibility of sanctions. While sociological and cultural factors play a role, these are largely endogenously determined by efficient, non-corrupt, and credible government institutions, especially the tax administration. Major difference in performance between the two countries comes from significant differences in the efficacy of tax audits. While in Argentina the focus has been on raising revenues, in Chile the focus has been on enhancing compliance by matching computerized and third-party information. Argentina has relied more on penal sanctions than Chile, but this strategy has not worked because penalties only are effective deterrents when there is some certainty about being detected. In addition, Chile has been much more efficient than Argentina in the allocation and deployment of administrative resources; not only does Chile spend considerably less in tax administration per dollar raised in

revenues, but a larger share of Chile's resources have been allocated to tax audit. See also Tanzi and Shome (1993) for a discussion of the types of penalties used in LAC countries, although this information is now somewhat outdated.

#### **4. A digression on the theoretical foundations of individual compliance behavior**

In the context of penalties and other sanctions, it is useful to discuss briefly the standard economic approach to the analysis of tax compliance. This approach has relied upon the economics-of-crime methodology pioneered by Becker (1968) and first applied to tax compliance by Allingham and Sandmo (1972). In this section we first review the basic model of individual compliance behavior and the many extensions to the basic model. We then assess the relevance of this literature for LAC country experiences.

In its simplest form, this approach assumes that an individual receives a fixed amount of income  $I$  and must choose how much of this income to declare to the tax authorities and how much to underreport. The individual pays taxes at rate  $t$  on every dollar  $D$  of income that is declared, while no taxes are paid on underreported income. However, the individual may be audited with a fixed and pre-determined probability  $p$ ; if audited, then all underreported income is discovered, and the individual must pay a penalty at rate  $f$  on each dollar that he or she was supposed to pay in taxes but did not pay. The individual's income  $I_C$  if caught underreporting equals  $I_C = I - tD - f[t(I - D)]$ , while if underreporting is not caught, income  $I_N$  is  $I_N = I - tD$ . The individual chooses declared income to maximize the expected utility of the evasion gamble, or  $EU(I) = pU(I_C) + (1-p)U(I_N)$ , where  $E$  is the expectation operator and utility  $U(I)$  is a function only of income. This optimization generates a standard first-order condition for an interior solution; given concavity of the utility function, the second-order condition will be satisfied.<sup>9</sup>

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<sup>9</sup> The first- and second-order conditions are, respectively:

Comparative statics results are easily derived. It is straightforward to show that an increase in the probability of detection  $p$  and the penalty rate  $f$  unambiguously increase declared income.<sup>10</sup> An increase in income has an ambiguous effect on declared income, an effect that depends upon the individual's attitude toward risk. Surprisingly, an increase in the tax rate  $t$  has an ambiguous effect on declared income. A higher tax rate increases the return to cheating, which reduces the amount of declared income. However, a higher tax rate also reduces income; if, as is usually assumed, the individual exhibits decreasing absolute risk aversion, then the lower income makes the evasion gamble less attractive and declared income increases accordingly (Yitzhaki, 1974).

This economics-of-crime approach gives the sensible result that compliance depends upon enforcement. However, it is essential to recognize that this approach also concludes that an individual pays taxes because – and only because – of the economic consequences of detection and punishment.<sup>11</sup> Again, this is a plausible and productive insight, with the obvious implication that the government can encourage greater tax compliance by increasing the audit and the penalty rates. The many extensions of this economics-of-crime approach considerably complicate the theoretical analyses, and generally render clear-cut analytical results impossible.<sup>12</sup> Nevertheless, they retain the basic approach and the basic result: individuals focus exclusively on

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$$\partial EU(I) / \partial D = pt(f-1)U'(I_C) - (1-p)tU'(I_N) = 0$$

$$\partial EU(I)^2 / \partial D^2 = p[t(f-1)]^2 U''(I_C) + (1-p)t^2 U''(I_N) < 0,$$

where each prime denotes a derivative.

<sup>10</sup> For example, total differentiation of the first-order condition demonstrates that the impact of a change in the probability of audit on declared income is given by:

$$\partial D / \partial p = -[t(f-1) U'(I_C) + t U'(I_N)] / [pt^2(f-1)^2 U''(I_C) + (1-p)t^2 U''(I_N)].$$

Given the second-order conditions (and the obvious requirement that  $f > I$ ), the sign of this expression is unambiguously positive. Other comparative statics results are similarly derived.

<sup>11</sup> For example, it can be shown that a risk-neutral individual will optimally choose to pay taxes equal only to the expected value of the penalty on unreported income. See Alm (2000) for further discussion.

<sup>12</sup> For example, if the basic model is expanded by assuming that individuals can simultaneously use two strategies to evade taxes (e.g., underreporting income and overstating deductions), then it is no longer possible to predict that increased penalties or probabilities of detection will reduce evasion. See Martinez-Vazquez and Rider (1995).

the financial incentives of the evasion gamble, and individuals pay taxes solely because they fear detection and punishment. See Cowell (1990), Andreoni, Erard, and Feinstein (1998), and Alm (2000) for further discussions of the economics-of-crime approach to tax compliance.<sup>13</sup>

However, it is clear to many observers that compliance cannot be explained entirely by such financial considerations, especially those generated by the level of enforcement (Graetz and Wilde, 1985; Smith and Kinsey, 1987; Elffers, 1991). For example, the percentage of individual income tax returns that are subject to a thorough tax audit is generally quite small in most countries, often less than 1 percent of all returns and typically much lower in LAC countries. Similarly, the penalty on even fraudulent evasion seldom exceeds more than the amount of unpaid taxes, and these penalties are infrequently imposed; civil penalties on non-fraudulent evasion are even smaller. A purely economic analysis of the evasion gamble suggests that most rational individuals should either underreport income not subject to source withholding or overclaim deductions not subject to independent verification because it is extremely unlikely that such cheating will be caught and penalized. However, even in the least compliant countries evasion never rises to levels predicted by a purely economic analysis, and in fact there are often substantial numbers of individuals who apparently pay all of their taxes regardless of the financial incentives they face from the enforcement regime.<sup>14</sup>

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<sup>13</sup> There has also been some work to expand the basic model of individual choice by introducing some aspects of behavior or motivation considered explicitly by other social sciences, such as “overweighting” of low probabilities, “reference point” effects, deviancy, personal and situational characteristics, social contexts, and attribution theory. See Smith and Kinsey (1987) and Webley et al. (1991) for discussions and evaluations of many of these alternative theories. See also McCaffery and Slemrod (2006) for a collection of papers that discuss “behavioral economics” approaches to individual behavior, including tax compliance decisions.

<sup>14</sup> This dilemma can be illustrated more precisely, using the standard model of the individual compliance decision. Suppose that the utility function of the individual is  $I_i^{1-e}/(1-e)$ , where the subscript  $i$  refers to the state of the world ( $i=C,N$ ) and  $e$  is a measure of the individual's constant (relative) risk aversion. Using the earlier definitions of  $I_C$  and  $I_N$ , the expected utility maximization can then be solved for the optimum amount of declared income  $D^*$ . Now suppose that  $D^*$  is calculated for specific, realistic values of the various parameters. For example, if  $t=0.4$ ,  $f=2$ ,  $p=0.02$ , and  $e=1$ , then the individual will optimally declare no income. Very large values for relative risk aversion are required to generate compliance consistent with actual country experience. When  $e=3$ , declared income is only 14 percent of true income; when  $e=5$ , it is still only 44 percent; when  $e=10$ , it is 71 percent. Risk aversion must exceed 30 for compliance to exceed 90 percent. However, existing field evidence on the coefficient of relative risk

The basic model of individual compliance behavior therefore implies that rational individuals should report virtually no income. Although compliance varies significantly across countries and across taxes, and is often quite low, compliance seldom falls to a level predicted by the standard economic theory of compliance, even in LAC countries. It seems implausible that government enforcement activities alone can account for these levels of compliance; the basic model, in its reliance on expected utility theory, is certainly unable to explain this behavior. Indeed, the puzzle of tax compliance behavior is why people pay taxes, not why they evade them (Alm, McClelland, and Schulze, 1992). This observation suggests that the compliance decision must be affected in ways not captured by the basic economics-of-crime approach.

In short, the limited ability to incorporate many relevant factors or to incorporate them in a meaningful way has meant that the standard theoretical analysis of the compliance decision is largely unable to explain the level of tax reporting, even when it has more success in explaining the change in reporting in response to policy innovations. In particular, these models generally imply that rational individuals should pay far less in taxes than they actually do. This is not a mere quibble. It goes to the heart of the basic model, as well as its many extensions, for explaining compliance. Consequently, most of the theoretical analyses that economists have produced in the context of developed economies give limited help in understanding the problem of tax evasion in LAC countries. As Alm and Martinez-Vazquez (2003) argue at some length, a meaningful study of tax compliance requires recognition of the important, perhaps decisive, role of societal institutions in the tax compliance decision. It is in the context that “tax morale” plays an especially important role, as discussed in more detail later.

## **5. The presence of the “informal sector”?**

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aversion suggests that  $e$  ranges between 1 and 2. Risk aversion must be abnormally large for behavior to be even roughly comparable to actual observed choices, even in many LAC countries with low levels of compliance.

The starting point here must be to define precisely the informal sector and its participants. Are these individuals who mainly operate in small- and medium-sized enterprises? Are they mainly self-employed professionals, individual proprietors, or farmers? There is no single definition that is universally accepted. Indeed, all taxpayers are hard to tax in one way or another. However, there is a group of taxpayers that it is considerably more difficult to tax than the rest. Who are they and how do we identify them?

No precise and widely accepted definition exists of the informal sector – sometimes also referred to as the “hard-to-tax” (HTT) sector – but there are various notions. As noted by Terkper (2003), these are taxpayers who often fail to register voluntarily. Even when they do register, they generally fail to keep appropriate records of their earnings and costs, they often do not promptly file their tax returns, and they frequently tend to be tax delinquent.

Das-Gupta (1994) attempts to develop a theory of these groups based on the number of transactions involved in the derivation of income. Thus, while salaried employees derive income from a single transaction with their employers and find it hard to hide their income, professionals derive their income from multiple transactions with clients and find it easier to hide their incomes. In the context of the Allingham and Sandmo (1972) model of tax evasion, Das-Gupta (1994) argues that the penalties and taxes due decrease as the number of income-generating transactions increases. However, this approach fails to have general appeal because it is easy to find counterexamples of economic agents deriving income in multiple transactions (e.g., hotels, restaurants) that do not fall into the category of the informal sector.

Independently of the right definition or model, there is considerable consensus in the tax literature regarding the identity of those in the informal sector. Musgrave (1990), Terkper (2003), and Engelschalk (2003) identify these agents with small-and-medium-sized firms,

professionals, and farmers.<sup>15</sup> Similarly, Tanzi and Casanegra (1989) identify them mainly with individual proprietorships, farmers, and professionals. There appears to be consensus also that the more sophisticated hard-to-tax activities, such as electronic commerce or multinational corporations with highly mobile capital and sophisticated transfer pricing activities, should not be considered part of the informal sector.

What is interesting is that the so-called HTT include taxpayers in both the informal and the formal sectors of the economy. In the informal sector, the hard-to-tax may include unregistered merchants and professionals who are involved in cash transactions or even barter. As Terkper (2003) points out, these individuals may have genuine difficulty in keeping even simple accounts, and may not be familiar with banking and other financial transactions. In the formal sector, the HTT may include professionals with college educations, as well as small manufacturing firms and commercial farms who are capable of keeping accounts and who often do so for purposes other than paying taxes. Thus both types of the HTT may or may not operate in a cash economy, and they may or may not be capable, but are always unwilling, to provide the tax authorities with relevant information that the tax authorities have a hard time extracting from them (Bird and Oldman, 1990).

The idea of the informal sector is closely related to several other important concepts, including the shadow economy and tax evasion. These two sets of issues have separately received considerable attention. Even so, it seems evident that the entire problem of tax evasion is a much larger problem than the informal sector. Many forms and types of tax evasion fall outside the purview of the informal sector (or the HTT), such as evasion by large corporations and even by ordinary common taxpayers.<sup>16</sup> However, in terms of their economic base,

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<sup>15</sup> The term “hard-to-tax” appears at least as far back as the Musgrave Report for Colombia of 1971.

<sup>16</sup> We do not discuss here other possible relationships and distinctions among these concepts. See Feinstein (1999) and Lippert and Walker (1997) for discussions of the relationship between tax evasion and the shadow economy. Lippert and Walker (1997), for example, argue that tax evasion more often involves financial transactions with the

individuals in the informal sector are likely to be quite similar to those who operate in the shadow economy.

Like with the informal sector, most authors trying to measure the shadow economy face the difficulty of how to define it. Smith (1994) defines it as “market-based production of goods and services, whether legal or illegal that escapes detection in the official estimates of GDP”. A more commonly used working definition is all currently unregistered economic activities that contribute to the officially calculated and observed GNP or GDP (Frey and Pommerehne, 1984; Feige, 1989; Schneider, 2002; Schneider and Enste, 2000, 2002). As these definitions still leave many questions, Table 3 is helpful for developing a consensus definition of the legal economy and the illegal underground (or shadow) economy.

From Table 3, it becomes clear that the shadow economy includes unreported income from the production of legal goods and services, either from monetary or barter transactions, and so includes all economic activities that would generally be taxable were they reported to the state (tax) authorities. A more precise general definition seems quite difficult, if not impossible, as the shadow economy evolves over time, adjusting to taxes, enforcement changes, and general societal attitudes.

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objective of concealing income, while the shadow economy more often involves the production of goods and services with labor and other inputs.

Table 3. A Taxonomy of Types of Underground Economy Activities

Type of Activity	Monetary Transactions		Non-monetary Transactions	
<b>Illegal Activities</b>	Trade with stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling and fraud		Barter of drugs, stolen goods, smuggling, and the like; produce or grow drugs for own use; theft for own use.	
	Tax Evasion	Tax Avoidance	Tax Evasion	Tax Avoidance
<b>Legal Activities</b>	Unreported income from self-employment; wages, salaries, and assets from unreported work related to legal services and goods; informal salaried workers (e.g., employees in firms that are entirely informal and are not registered to pay taxes) and formal firms); evasion of other taxes including corporate income tax and VAT (through sales underreporting and the like)	Employee discounts, fringe benefits, abuses of tax holidays, doubtful deductions, and so on	Barter of legal services and goods	Do-it-yourself work and neighbor help

Source: Lippert and Walker (1997).

As defined by Schneider and Enste (2000), the “shadow economy” includes income unreported to the tax authorities that is generated from the production of legal goods and services, often by means of clandestine labor, involving monetary or barter transactions by agents that are not registered or do not pay taxes.<sup>17</sup> As a result, we use measures of the shadow economy to measure also the informal sector; that is, the proxy measures that we use for the size of the informal sector are estimates of the shadow economy in different countries around the world, generated from the work of Schneider (2002) and Schneider and Enste (2002). The next section presents these estimates.

<sup>17</sup> The boundary between the shadow economy and criminal activities is that in the latter both production and output are illegal while in the former only production is illegal (Thomas, 1992). Most definitions of the informal sector exclude criminal activities.

## **6. What is the size of the informal sector in LAC countries and beyond?**

Schneider (2002) and Schneider and Enste (2000, 2002) have used various methods and time periods to estimate the size of the shadow economy for single countries and groups of countries. These estimates are presented in Figure 1, and Table 4 summarizes the country estimates.<sup>18</sup> The physical input (electricity) method, the currency demand, and the model (or DYMIMIC) approach are used for developing countries. For comparison purposes we also show the results for other regions around the world in Figures A-1 to A-5 in the Appendix.

**Table 4. The Relative Size of the Shadow Economy, 1999/2000**

<b>Country</b>	<b>Shadow Economy as Percent of GNP 1999/2000</b>	<b>Country</b>	<b>Shadow Economy as Percent of GNP 1999/2000</b>
Albania	33.4	<b>Guatemala</b>	<b>51.5</b>
Algeria	34.1	<b>Honduras</b>	<b>49.6</b>
<b>Argentina</b>	<b>25.4</b>	Hong Kong, China	16.6
Armenia	46.3	Hungary	25.1
Australia	14.3	India	23.1
Austria	10.2	Indonesia	19.4
Azerbaijan	60.6	Iran	18.9
Bangladesh	35.6	Ireland	15.8
Belarus	48.1	Israel	21.9
Belgium	23.2	Italy	27
Benin	45.2	<b>Jamaica</b>	<b>36.4</b>
Bolivia	67.1	Japan	11.3
Bosnia-Herzegovina	34.1	Jordan	19.4
Botswana	33.4	Kazakhstan	43.2
<b>Brazil</b>	<b>39.8</b>	Kenya	34.3
Bulgaria	36.9	Republic of Korea	27.5
Burkina Faso	38.4	Kyrgyz Republic	39.8
Cameroon	32.8	Latvia	39.9
Canada	16	Lebanon	34.1
<b>Chile</b>	<b>19.8</b>	Lithuania	30.3

<sup>18</sup> See Schneider (2002) and Schneider and Enste (2000, 2002) for a detailed discussion of these methods and estimates.

China	13.1	Madagascar	39.6
<b>Colombia</b>	<b>39.1</b>	Malawi	40.3
<b>Costa Rica</b>	<b>26.2</b>	Malaysia	31.1
Cote d'Ivoire	39.9	Mali	41
Croatia	33.4	<b>Mexico</b>	<b>30.1</b>
Czech Republic	19.1	Moldova	45.1
Denmark	18.2	Mongolia	18.4
<b>Dominican Republic</b>	<b>32.1</b>	Morocco	36.4
<b>Ecuador</b>	<b>34.4</b>	Mozambique	40.3
Egypt	35.1	Nepal	38.4
Ethiopia	40.3	Netherlands	13
Finland	18.3	New Zealand	12.8
France	15.3	<b>Nicaragua</b>	<b>45.2</b>
Georgia	67.3	Niger	41.9
Germany	16.3	Nigeria	57.9
Ghana	38.4	Norway	19.1
Greece	28.6	Pakistan	36.8
<b>Panama</b>	<b>64.1</b>	Taiwan, China	19.6
<b>Peru</b>	<b>59.9</b>	Tanzania	58.3
Philippines	43.4	Thailand	52.6
Poland	27.6	Tunisia	38.4
Portugal	22.6	Turkey	32.1
Romania	34.4	Uganda	43.1
Russian Federation	46.1	Ukraine	52.2
Saudi Arabia	18.4	United Arab Emirates	26.4
Senegal	43.2	United Kingdom	12.6
Singapore	13.1	United States	8.7
Slovak Republic	18.9	<b>Uruguay</b>	<b>51.1</b>
Slovenia	27.1	Uzbekistan	34.1
South Africa	28.4	<b>Venezuela</b>	<b>33.6</b>
Spain	22.6	Vietnam	15.6
Sri Lanka	44.6	Yemen	27.4
Sweden	19.1	Yugoslavia	29.1
Switzerland	8.8	Zambia	48.9
Syria	19.3	Zimbabwe	59.4

Sources: Schneider (2002) and Schneider and Enste (2000, 2002). The physical input (electricity) method, the currency method, and the model (DYMIMIC) approach are used for the developing countries in Africa, Asia, and South America; the information is taken from Tables 2, 3, and 4 of Schneider (2002). The size of the shadow economy in transition countries is estimated using similar methods, and the information is taken from Table 5 of Schneider (2002). For all OECD countries except New Zealand, the size of the shadow economy is calculated using the currency demand method and taken from Table 8 of Schneider (2002); for New Zealand, the shadow economy is estimated using both the MIMIC-method and the currency

demand approach.

The results for 17 **LAC** countries for 1999/2000 (Figure 1) show an average size of shadow economy of these countries of 41.0 percent of official GNP. The largest shadow economy is in Bolivia with 67.1 percent, followed by Panama (64.1 percent), and Peru (59.9 percent); the smallest shadow economies are in Chile (19.8 percent) and Argentina (25.4 percent). Overall, the average sizes of the shadow economies of South and Latin America and of Africa are generally similar, and somewhat larger than in Asia.

On average, the size of the shadow economy in **Africa** (Figure A-1) was 41 percent of GNP for the year 1999/2000. Zimbabwe, Tanzania, and Nigeria (with 59.4, 58.3, and 57.9 percent, respectively) have by far the largest shadow economies; in the middle are Mozambique, Cote d'Ivoire, and Madagascar with 40.3, 39.9, and 39.6 percent; at the lower end are Botswana with 33.4 percent, Cameroon with 32.8 percent, and South Africa with 28.4 percent. The sizes of the shadow economies in Africa are typically quite large.

The results for **Asia** are shown in Figure A-2, recognizing that it is somewhat difficult to treat all Asian countries equally because Japan, Singapore, and Hong Kong are highly developed states and the others are more or less developing countries. Thailand has by far the largest shadow economy in the year 1999/2000 with an estimated shadow economy of 52.6 percent of official GNP; Thailand is followed by Sri Lanka (44.6 percent) and the Philippines (43.4 percent). In the middle range are India with an estimated shadow economy of 23.1 percent of GNP, Israel with 21.9 percent, and Taiwan and China with 19.6 percent. At the lower end are Singapore (13.1 percent) and Japan (11.3 percent). On average Asian developing countries have a size of the shadow economy of 26 percent of official GNP for the year 1999/2000.

The shadow economies of **Transition** countries have been estimated using the currency demand, the physical input, and the DYMIMIC approaches, and are shown in Figure A-3 in the

Appendix. The average size of the shadow economy relative to official GNP is 38.0 percent for the year 1999/2000. Georgia has by far the largest shadow economy at 67.3 percent of GNP, followed by Azerbaijan with 60.6 percent and Ukraine with 52.2 percent. At the lower end are Hungary (25.1 percent), the Czech Republic (19.1 percent), and the Slovak Republic (18.9 percent).

**OECD** countries typically have a smaller shadow economy than the other country groupings. European OECD countries are shown in Figure A-4, and the remaining OECD countries (Australia, Canada, New Zealand, and the United States) are given in Figure A-5. The average size of the 16 European OECD countries is 18.0 percent, while the average size for the remaining OECD countries is 13.5 percent. Aside from some limited information on OECD countries, we have little information on how the problem of the hard-to-tax has evolved through time in any particular country. Schneider and Enste (2000) review several reasons to expect growth over time of the shadow economy, including the increasing burden of taxes and social security contributions and the increasing complexity of the tax systems and government regulations.<sup>19</sup> The size of the informal sector may also be expected to grow as economies evolve toward a higher relative importance of services (e.g., small business and individual entrepreneurs and professionals) and a lower relative importance of manufacturing with large businesses and employers.<sup>20</sup>

All the estimates of the informal sector and the shadow economy are subject to significant data limitations and their interpretation to important caveats. In particular, the estimates and implied rankings of shadow economies may reflect cross-country differences in the

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<sup>19</sup> This process can be more pronounced in some developing countries caught in a “bad equilibrium” (Johnson, Kaufman, and Zoido-Lobaton, 1998): high taxes and high regulatory burdens lead to increases in the shadow economy, which may lead to still higher taxes and higher regulations, and so on.

<sup>20</sup> See Lyssiotou, Pashardes and Stengos (2004), Tanzi (1999), and articles in the special issue of *The Economic Journal* (June 1999, Volume 109, Issue 456).

velocity of money confounded with true variations in the size of the informal sector, since the estimates are in many cases based on residuals of money demand relations.

*Given these limitations and caveats on the size estimates, it is of some interest to examine the relationship between these and other measures. Table 5 presents some a simple correlation coefficient between some informality as a percent of sales and the Schneider and Enste (2000, 2002) and Schneider (2002) estimates of the shadow economy. Overall, the correlation coefficient does not indicate a close connection between these measures, but this does not indicate which of the two measures may be more accurate.*

**Table 5. Correlation Coefficient between Measures**

	<b>Informality as Percent of Sales Amount Reported for Tax Purposes<sup>a</sup></b>	<b>Shadow Economy as Percent of GNP 1999/2000<sup>b</sup></b>
<b>Informality as Percent of Sales Amount Reported for Tax Purposes<sup>1)</sup></b>	1	---
<b>Shadow Economy as Percent of GNP 1999/2000<sup>2)</sup></b>	-0.07001	1

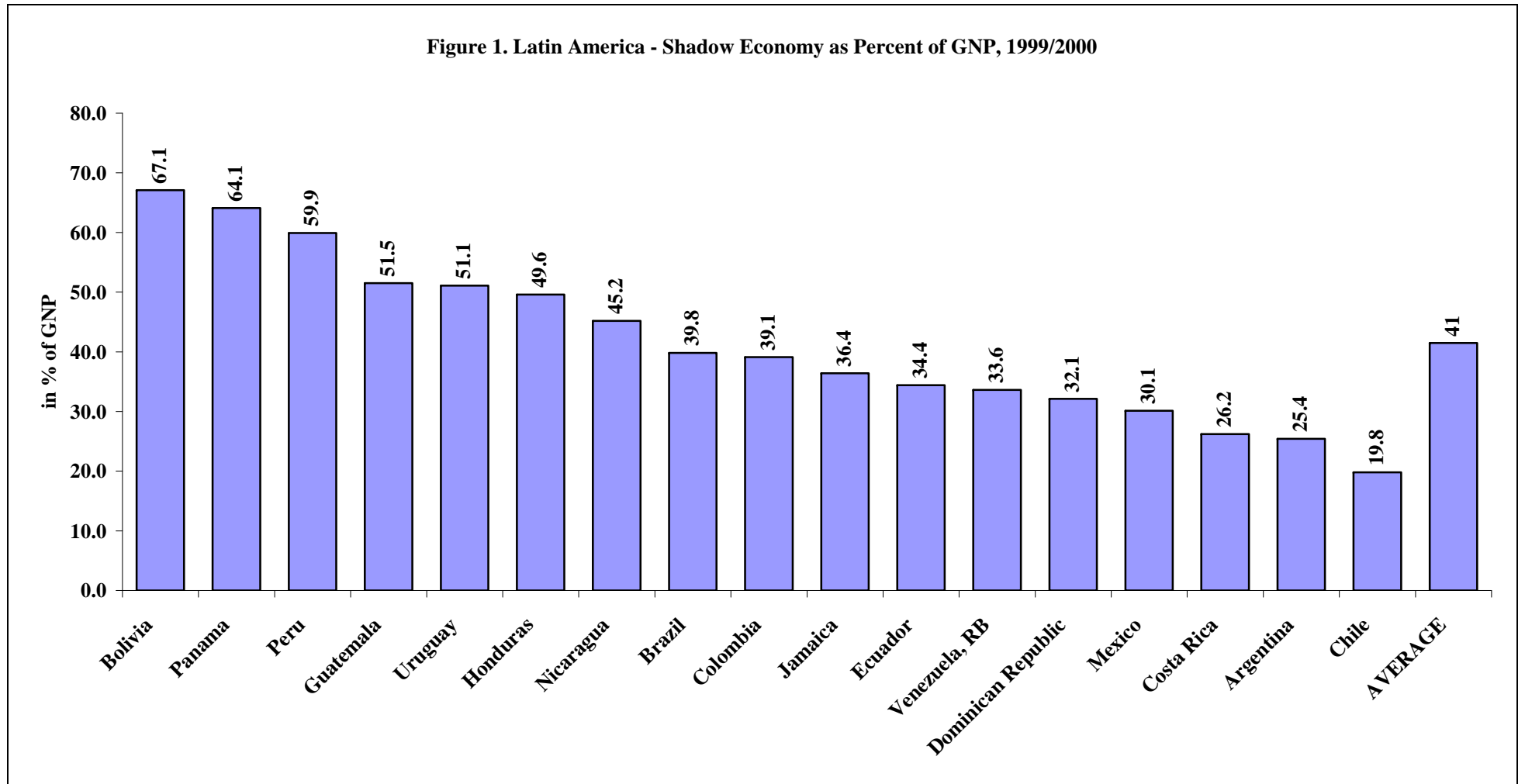
Source: Calculations by authors.

Note: The correlations are based on data from 62 countries.

<sup>a</sup> These data are from the World Business Environment Survey/ WB Investment Climate Assessment, 2002-2006, available at <http://www.enterprisesurveys.org/ExploreTopics/CompareAll.aspx?topic=informality>.

<sup>b</sup> These data are from Schneider (2002) and Schneider and Enste (2000, 2002).

Figure 1. Latin America - Shadow Economy as Percent of GNP, 1999/2000



## **7. What are some effects from an informal sector, including the size of the “fiscal gap”?**

Despite their limitations, these estimates of the shadow economy are used in the rest of the paper as a proxy measure of the informal sector in order to quantify various aspects and effects of the informal sector.

A first issue is the determinants of the size of the informal sector, and Table 6 presents some simple correlations between size and possible causes. The relative importance of the informal sector is likely to vary across countries and over time, and to vary according to some obvious determinants. A priori, there should be a larger relative presence when there are more taxpayers unprepared to keep books of accounts and where the tax administration lacks the means both to help and also to audit those other taxpayers who can keep their accounts but refuse to keep them or disclose them to the authorities. Thus, the problem of the informal sector is likely to decrease in importance with the level of economic development. This hypothesis receives some support from the simple correlation coefficient between our proxy for the informal sector and GDP per capita in Table 6.

The problem of the informal sector could also be seen as becoming more serious when the public sector is trying to raise more taxes, exercising a higher tax effort. Perhaps surprisingly, however, this hypothesis is not supported by the correlation coefficient between the size of the informal sector and tax effort in Table 6, although this result may reflect that the fact that tax effort is highly correlated with GDP per capita.

For the same level of general economic development, as measured by GDP per capita, we would expect the size of the informal sector to increase with the relative share of agriculture in GDP and decrease with the share in GDP of manufacturing.<sup>21</sup> Although we are not controlling for the level of development, the positive correlation coefficient for the share

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<sup>21</sup> Of course, we do not know precisely the relative predominance of the self-employed in developing and developed economies. Interestingly, the self-employed seem to be increasing in importance in mature economies.

of agriculture in Table 6 supports the notion of higher incidence of the informal sector with a larger relative presence of agriculture.

We would also expect the problems of the informal sector to become more acute in societies with higher levels of corruption. We measure the latter through the CPI score from Amnesty International, which "...relates to perceptions of the degree of corruption as seen by business people, risk analysts and the general public, and ranges between 10 (highly clean) and 0 (highly corrupt)". This hypothesis is supported by the negative correlation coefficient in Table 6. Thus, the shadow economy seems highly complementary with corruption: a less corrupt economy (and so an economy with a higher CPI score) tends to be an economy with a smaller informal sector.

**Table 6. Correlation Coefficients between the Shadow Economy and Selected Variables**

	<b>GDP per Capita</b>	<b>Tax Revenue/ GDP</b>	<b>Manufacturing Value Added/ GDP</b>	<b>Agriculture/ GDP</b>	<b>Corruption Index</b>
Shadow Economy/GNP	-0.50	-0.26	0.02	0.45	-0.60

Source: Calculations by authors.

Recent work by Dabla-Norris, Gradstein, and Inchauste (2005) looks at the determinants of the size of the informal sector, including tax and regulation burdens, financial market development, and the quality of the legal system. They find evidence that practically all the factors previously identified in the literature play a role in explaining the presence of informality. They particularly emphasize the role played by the quality of the legal system. Similarly, Loayza, Oviedo, and Serven (2005) also find that a heavier regulatory burden in product and labor markets leads to the higher presence of informality. Schneider and Enste (2000) find that increasing taxation and social security contributions, rising state regulations, and possibly corruption all lead to a higher incidence of informality.

On this last point, there is a growing empirical literature linking corruption to informality (Dreher, Kotsogiannis, and McCorriston, 2005; Johnson, Kaufmann, McMillan

and Woodruff, 2000; Friedman, Johnson, Kaufmann, and Zoido-Lobaton, 2000). Also, there is some evidence of differential effects of corruption, effects that depend upon the level of income in the country. According to Dreher and Schneider (2006), corruption may cause larger (smaller) informal shadow economies in low (high) income countries.

As for some effects of the informal sector on taxation, an obvious and immediate effect of the presence of a large informal sector is to reduce the revenue potential of any given tax structure; that is, the existence of an informal sector increases the size of the “fiscal gap”. In addition, however, we argue that it is likely that the presence of the informal sector also affects the choice of tax structure (e.g., the composition of taxes).

Measuring the fiscal gap – indeed, measuring tax evasion more generally – is notoriously difficult. Still, there is widespread evidence that tax evasion is extensive and commonplace in nearly all countries. For the United States, the most recent estimates from the Internal Revenue Service suggest that the amount of unpaid federal individual and corporate income taxes totaled \$345 billion for 2000, with an annual growth rate of 10 percent since 1973. There is also some evidence for other countries, based on examination of individual tax returns, on tax effort/tax capacity estimations, on survey methods, on discrepancies between tax-related information and national income accounts or between income and consumption in the national income accounts, and the like. One approach has been to use estimates of the “shadow economy” as a proxy for the size of the informal sector and/or the amount of tax evasion, but there are numerous other approaches to estimating the shadow economy.

To our knowledge, there exists very limited direct information on the revenue losses implied by the informal sector per se. For the United States, Kenadjian (1982) reports on the findings of a 1979 IRS study that estimated total unreported legal sector income of \$74.9 billion in 1976, of which self-employment income was \$33 billion; a considerable share of unreported self-employment income could be considered as belonging to the hard-to-tax

group.<sup>22</sup> Also, Terkper (2003) states that developing countries lose tax revenue in proportionally greater amounts than developed countries from the informal sector because small and medium traders (e.g., the hard-to-tax) tend to thrive in underground economies. He estimates that the tax losses could constitute as much as 35 to 55 percent of GDP. As discussed below, our calculations lend some credence to these conjectures.

There are at least two possible ways that we can examine the impact of the informal sector on tax revenues. First, we can explore how its presence affects the overall tax effort in any country. As discussed earlier, there is a quite extensive literature on the determination of tax effort, as well as on its limitations (Bahl, 1971; Bird, 1980).<sup>23</sup> Despite these limitations, our hypothesis is that a greater presence of the informal sector will reduce the tax effort in any country. The regressions in Table 6 explore the effects of the relative size of the informal sector/shadow economy on “tax effort”, defined as total tax revenues in 2000 divided by GNP for the same year. We follow the literature on tax effort in our specification of different models. We include as one control variable GDP per capita, and we interact the relative size of the informal sector with GDP per capita. This interaction variable allows for a differential impact of the informal sector on tax effort at different levels of development. In particular, higher income countries may have better coping mechanism in tax enforcement to deal with the problems presented by the informal sector. In Model 1, we also introduce a group of variables that account for the existence of particular tax handles or that represent features of the economy that may facilitate tax collections (e.g., the share of mining in GDP) or impede tax collections (e.g., the share of agriculture in GDP). Because of the lack of data on these two variables, the number of usable observations becomes quite small. Therefore, we run

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<sup>22</sup> The IRS definition of self-employment bears a significant resemblance to an operational definition of the hard-to-tax: “...self-employment income covers net earnings of farm and non-farm proprietorships and partnerships (at times referred to as unincorporated business income) as well as net earnings of self-employed individuals working outside the context of regularly established businesses in the legal sector” (Kenadjian, 1982).

<sup>23</sup> See Table A-10 in the Appendix for a summary of this literature.

another equation (Model 2) without some of the control variables but with more observations. The estimation results are reported in Table 7, and are, of course, only suggestive.

The impact of the informal sector on tax effort in Table 7 is consistent across both models. As conjectured, the intensity of the informal sector reduces overall tax effort for a sample of developed and developing countries in 2000. However, this impact on tax effort gets dampened with increases in the level of economic development.

**Table 7. Determinants of Tax Effort<sup>a</sup>**

<i>Independent Variable</i>	<b>Model 1</b>	<b>Model 2</b>
GDP per Capita	-0.02 (-3.58)	-0.01 (-2.69)
Shadow Economy/GNP	-0.40 (-2.06)	-0.23 (-2.59)
(Shadow Economy/GNP) X GDP per Capita	.0001 (3.53)	9.17E-05 (3.42)
Taxes on Internal Trade/GDP	-2E-05 (-0.55)	-1.1E-05 (-0.46)
Agriculture/GDP	-0.001 (-0.72)	---
Mining/GDP	0.003 (2.02)	---
Constant	0.32 (4.37)	0.24 (5.94)
Observations	15	41
R-squared	0.83	0.34
<sup>a</sup> The dependent variable is total tax revenue divided by GNP in year 2000. White corrected t-statistics are in parentheses. The equations are estimated by OLS methods. Source: Calculations by authors.		

The second approach to examining the impact of the informal sector on tax revenues is to estimate directly the revenue losses induced by this group. To do this, we continue to make use of the assumption that the tax base of the informal sector can be approximated by the size of the shadow economy, and we also assume that the effective average tax rate in the formal (non-shadow) economy is also the effective average tax rate that would apply to the hard-to-tax. Both assumptions are open to question, and so our approach is only suggestive. Indeed, our estimates of the revenue loss from the informal sector seem likely to be upper-boundary

estimates, for several reasons. First, the actual size of the hard-to-tax may be smaller than the underground economy. Second, the effective average tax rate that would apply to activities in the informal sector is likely to be lower than that of the regular formal economy.

Table 8 shows the summary statistics for the losses in revenues for two groups of developing and developed countries, with the losses in revenues expressed as a percentage of potential tax revenues, where potential tax revenues are derived from the estimates in Table 7 and losses in revenues are calculated as the difference between potential tax revenue and actual tax revenues. Revenue losses tend to be considerably higher (in relative terms) in developing countries than in developed countries; they also tend to show higher dispersion in developing countries. The estimates of losses can represent up to 40 percent of total potential revenues in developing countries.

**Table 8. Ratio of Revenue Loss from the Hard-to-tax to Potential Tax Revenue**

<b>Sample</b>	<b>Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Developing	57	0.25	0.07	0.11	0.40
Industrialized	19	0.15	0.05	0.08	0.22
Whole World	76	0.22	0.07	0.08	0.40

Source: Calculations by authors.

Also, there is some work that examines the role of societal institutions on tax effort. For example, governance, corruption, the rule of law, trust in government, and similar factors seem likely to affect estimates of tax effort. In this regard, Bird, Martinez-Vazquez, and Torgler (2006) have studied the role of demand factors such as societal institutions in explaining relative revenue performance in developing countries. Their basic premise is that although traditional “supply factors”, such as the availability of tax handles and the structure of tax bases, clearly matter in explaining tax effort, there is also a need to account for citizen attitudes in response to government performance as shaped by societal institutions. To

account for such “demand factors”, or societal institutions, they study the explanatory power of the following variables:

- Quality of governance index, as in Kaufmann, Kraay, and Mastruzzi (2003). These data capture several governance dimensions (e.g., voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption). They also use an alternative data set based on the *International Country Risk Guide* (Knack, 1999), which includes other variables such as bureaucratic quality, ethnic tension, repudiation of government contracts, and expropriation risk.
- Regulation of entry, as a measure of public rents, using data from Djankov et al. (2002).
- Tax morale and the shadow economy, using data from the Latinobarómetro, the World Values Survey, and the European Values Survey.
- Inequality in income and wealth distribution, since more unequal distributions can lead to lower levels of solidarity by the elites toward lower income groups, using data from Galbraith and Kum (2003).
- Fiscal decentralization, since a more decentralized system of government tends to be more responsive and can better meet taxpayers’ needs and preferences, and since a more decentralized system of government imposes more restrictions on the ability of government to act as a Leviathan, using GFS data from the IMF.

*The empirical results of Bird, Martinez-Vazquez, and Torgler (2006) strongly suggest that institutions play a significant role in the determination of the level of tax effort of developing and transition countries. Although the conventional supply factors continue to play a robust and significant role, demand factors also clearly matter. Their empirical findings are summarized in Table 9. From the demand factors, voice variables, especially for the Quality of Governance and International Country Risk Guide indexes, yield the most robust results*

**Table 9. Determinants of Tax/Revenue Effort: Summary of the Results in Bird, Martinez-Vazquez, and Torgler (2006)**

Dependent Variables	Estimations without Societal Institutions		Estimations with Societal Institutions		Fuller Specifications	
	Tax Effort	Revenue Effort	Tax Effort	Revenue Effort	Tax Effort	Revenue Effort
<b>Independent Variables</b>						
<b>DEVELOPMENT</b>						
GDP Per Capita	(+/-)	(+/-)	(-)	(-)	(-)	-
Population Growth	-	-	(-)	(-)	(-)	(-)
<b>OPENNESS</b>						
(Exports+ Imports/GDP	((-))	((-))	((-))	(-)	(-)	((-))
<b>ECONOMIC STRUCTURE</b>						
Agriculture/GDP	+	+	+	+	+	+
<b>REGIONS</b>						
Latin America	(-)	(-)	(-)	(-)	(-)	(-)
<b>INEQUALITY</b>						
			(-)	(-)	((-))	((-))
<b>WILLINGNESS TO PAY</b>						
Size of Shadow Economy			(-)	-	((-))	((-))
Tax Morale			((+))	+	((-))	((-))
<b>INSTITUTIONS</b>						
Governance Variables			+	+	+	+
ICRG Variables			+	+	+	+
<b>REGULATION OF ENTRY</b>						
Number of Procedures			(-)	(-)	-	-
Time			(-)	-	((-))	-

Source: Bird, Martinez-Vazquez and Torgler (2006).

Note: +/- denotes always significant positive or negative coefficient signs; (+/-) denotes positive or negative coefficients signs although these are not always statistically significant; and ((+/-)) denotes positive or negative coefficient signs without these coefficients being statistically significant.

Figures 2 and 3 show the plots of the estimates of relative revenue losses versus GDP per capita, for developing countries (Figure 2) and for developed countries (Figure 3). Although there is a high level of dispersion, clearly there is a tendency in both developing and industrialized countries for relative revenue losses to become smaller with the level of development. This, of course, reflects the fact that tax efforts on average tends to be higher in more developed countries. However, as discussed earlier, there is a wide dispersion of relative revenue losses, which begs the question of what are the underlying causes for the different performances.

**Figure 2**

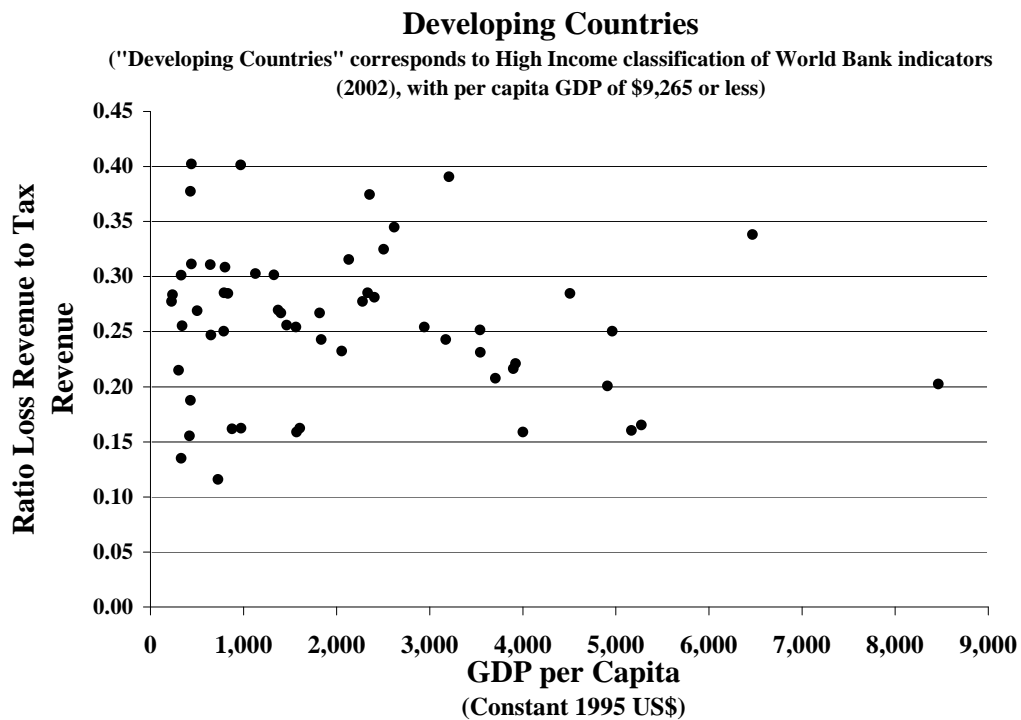
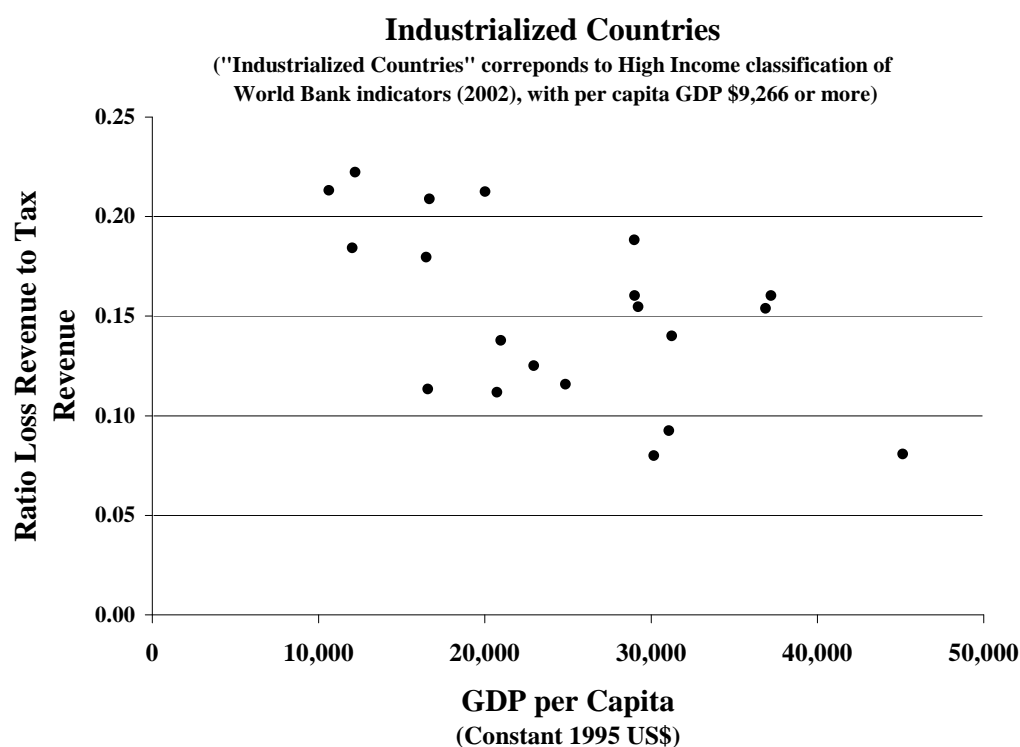


Figure 3



Consider now the impact the informal sector on the structure of the tax system itself. Shoup (1990), among others, points out the constraints imposed by economic structure, administrative capabilities, and taxpayer voluntary compliance on the choice of tax structure. Clearly, a higher presence of the informal sector in developing countries and also in developed countries may constrain the optimal choice of the tax mix. A heavy presence of informal activity leaves less room for sophisticated taxes requiring more reporting by taxpayers and more complex auditing by tax administrators. Thus, we hypothesize that a larger informal sector should be associated with more reliance on indirect taxes (especially excises), on taxes on international trade, and on natural resource extraction.<sup>24</sup>

Before we examine some preliminary evidence on this hypothesis, it is important to note that we might also expect to find a reverse causality between the tax mix and the shadow economy in general. For example, Brou and Collins (2001) study the impact of the tax mix on the informal

<sup>24</sup> See Boadway et al. (1994) for an analysis of the impact of tax evasion on the direct-indirect tax mix. They show that a tax mix is favorable to other methods of taxation when individuals are able to evade certain taxes.

economy in a general equilibrium model, and they conclude that direct taxation is a better instrument to raise revenues when government is concerned with controlling the growth of the informal sector.<sup>25</sup> They also blame recent policy changes favoring indirect taxation for the rapid growth internationally of the informal economy. We look here at some preliminary evidence on the hypothesis that a more significant presence of the informal sector leads countries to rely more heavily on indirect and simplified methods of taxation. Empirically, we find no evidence of simultaneity between the shadow economy and tax structure.

We can approximate the tax mix in a variety of ways. Five possible measures, or dependent variables, are:

**Ratio of Direct Taxes to Indirect Taxes:**

$$Dependent\ 1 = \frac{\text{Taxes on Income, Profit, and Capital Gains}}{(\text{Domestic Taxes on Goods and Services} + \text{Taxes on International Trade})}$$

***Ratio of Direct Taxes to Indirect Domestic Taxes:***

$$Dependent\ 2 = \frac{\text{Taxes on Income, Profit, and Capital Gains}}{\text{Domestic Taxes on Goods and Services}}$$

**Ratio of Special Taxes to Total Tax Revenue:**

$$Dependent\ 3 = \frac{(\text{Excises} + \text{Taxes on International Trade})}{\text{Total Tax Revenue}}$$

***Ratio of Direct Taxes to Total Tax Revenue:***

$$Dependent\ 4 = \frac{\text{Taxes on Income, Profit, and Capital Gains}}{\text{Total Tax Revenue}}$$

**Ratio of Domestic Taxes on Goods and Services to Total Tax Revenue:**

$$Dependent\ 5 = \frac{\text{Domestic Taxes on Goods and Services}}{\text{Total Tax Revenue}}$$

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<sup>25</sup> With direct taxation, Brou and Collins (2001) argue that lower taxes on labor than on capital will help shrink the labor-intensive informal sector.

Table 10 shows the results of simple OLS regressions explaining the variation across the sample of countries in tax mix, measured in the above five possible ways; independent variables include the relative size of the informal sector (again measured by the share of the shadow economy in GDP), as well as several control variables, including GDP per capita, the share of the manufacturing sector in GDP, and the openness of the economy.

The results in Table 10 are generally supportive of the hypothesis that, after controlling for the level of economic development and other factors, a larger informal sector leads to a heavier reliance on indirect taxation. As expected, the coefficient for the shadow economy is negative and statistically significant for dependent variables 1, 2, and 4, and positive and significant for variable 5. Note that the shadow economy coefficient for dependent variable 3 is negative, opposite of what was expected, but it is not statistically significant. The shadow economy should be much harder to reach through direct taxation, with the personal identification of taxpayers and so on, than through indirect taxation. Not surprisingly, the openness of the economy also leads to a heavier reliance on indirect taxation. It is, however, surprising that higher levels of GDP per capita seem to lead to greater reliance on indirect taxation. To test for the potential simultaneity of the informal sector and tax structure we run a Hausman Chi-square test with corruption as an instrument for the informal sector, and we fail to detect any presence of simultaneity.

**Table 10. Shadow Economy Effects on Tax Composition (2000)<sup>a</sup>**

<b>Explanatory Variable</b>	<b>Dependent 1</b>	<b>Dependent 2</b>	<b>Dependent 3</b>	<b>Dependent 4</b>	<b>Dependent 5</b>
GDP per Capita	0.21 (0.92)	-0.02 (-1.55)	-0.02 (2.36)	0.001 (0.29)	0.005 (3.08)
Shadow Economy /GNP	-1.48 (-2.34)	-2.71 (-1.85)	-0.04 (-0.24)	-0.34 (-2.15)	0.41 (2.94)
Manufacturing Valued Added/GDP	-0.01 (-0.51)	-0.05 (-0.81)	-0.002 (-0.56)	-0.001 (-0.30)	-0.005 (-1.17)
Openness	-0.004 (-2.04)	-0.006 (-1.62)	-0.001 (-1.56)	-0.002 (-2.41)	0.001 (1.55)
Constant	1.72 (2.03)	3.38 (1.70)	0.44 (3.46)	0.52 (3.96)	0.29 (2.61)
Observations	41	42	38	43	42

R-squared	0.11	0.10	0.24	0.21	0.19
<sup>a</sup> White corrected t-statistics for the OLS regressions are in parentheses.					
Source: Calculations by authors.					

## **8. What are the reasons for the fiscal gap?**

There are many suggested causes for the high informality, the fiscal gap, and/or tax evasion. The most obvious reason is poor tax administration (e.g., weak enforcement technology, capture of the tax administration by “elites”). There is much casual, and also some systematic, evidence that suggests that enforcement capacity, with the exception of Chile, is very low throughout the LAC region (Taliercio, 2004; Bergman, 2003; Tanzi and Shome, 1993). Tax auditing systems tend to be outdated and under-funded. Firms and workers may find it advantageous to collude to evade their share of payroll, income, and property taxes through informal hiring. Smaller firms are particularly costly to monitor. As a result, there tends to be a high concentration of tax collection on a small number of large firms (Gallagher, 2004). At the same time, larger firms usually have the political leverage to affect tax policy in ways that shift part of the tax burden to the non-rich. However, as discussed in some detail earlier, there is also considerable heterogeneity in the region with regards to the level and structure of taxation.

Some have also suggested that the intrinsic motivation to pay taxes (Frey, 1997) – what is sometimes termed “tax morale” – may differ across countries, for reasons related mainly to tax administration and enforcement but also to such factors as cultural norms. If taxpayer values are influenced by cultural norms, with different societal institutions acting as constraints and varying between different countries, then tax morale may be an important determinant of taxpayer compliance and other forms of behavior. However, isolating the reasons for these differences in tax morale is notoriously difficult.

Torgler (2005) presents information on tax morale in LAC countries, based on survey evidence from the World Values Survey (WVS) and the Latinobarómetro. The WVS is a

worldwide investigation of socio-cultural and political change that collects comparative data on values and belief systems among peoples around the world. It is based on representative national samples of at least 1000 individuals in a country, and has been conducted in more than 80 countries over multiple waves (or time periods). All surveys are done via face-to-face interviews at the respondents' homes and in their respective national languages. The sampling design consists of a multi-stage, random selection of sampling points with a number of individual observations drawn from all administrative regional units, after stratification by region and by degree of urbanization. The survey results can be weighted to represent national population parameters.<sup>26</sup> The Latinobarómetro is a similar survey that focuses on 17 LAC countries for 1998. Both ask an identical question to all individuals in the sampled countries that can be used to derive an estimate of tax morale. Both also ask a range of other questions on individual economic and demographic characteristics, as well as questions on societal attitudes about religion, and culture.

The general question to assess the level of tax morale is:

“Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between: ..... Cheating on tax if you have the chance (% “never justified” – code 1 from a ten-point scale where 1=never and 10=always).”

The natural cut-off point is at the survey response of 1 because many respondents assert that cheating on tax is “never justified”. Torgler (2005) then rescales the responses to create a TAX MORALE variable that ranges from from 0 to 3, where 3 is the highest tax morale (e.g., evasion is “never justified”) and 0 is the lowest tax morale. He uses this variable as a dependent variable in an ordered probit estimation, scaled from 0 to 3, in an attempt to determine whether variables (e.g., country/region, trust that people obey the law, trust in the president, in institutions, the perceived probability of being caught), as well as various socio-demographic and economic variables (e.g., age, sex, education, marital status, employment status), are significant determinants of TAX MORALE. The aggregate averages of tax morale in the 17 countries in the Latinobarómetro are

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<sup>26</sup> For a comprehensive discussion of the WVS, see Inglehart et al. (2000).

given in Table 11. See also Alm and Torgler (2006) for a similar analysis that examines OECD countries, as well as for a detailed discussion of the advantages and disadvantages of the WVS.

**Table 11. Tax Morale in Latin America and the Caribbean, 1998**

Country	Tax Morale <sup>a</sup>
Argentina	2.266
Bolivia	2.044
Brazil	2.165
Colombia	2.214
Costa Rica	2.100
Chile	2.209
Ecuador	1.910
El Salvador	2.205
Guatemala	2.556
Honduras	2.159
Mexico	1.732
Nicaragua	2.395
Panama	2.228
Paraguay	2.373
Peru	2.058
Uruguay	1.948
Venezuela	2.310
<sup>a</sup> “Tax Morale” is calculated as the simple average of individual responses in a country, scaled from 0 to 3, where 3 is the highest Tax Morale score (e.g., tax evasion is “never justified”). Source: Latinobarómetro.	

Torgler (2005) finds that people who say that they know or have heard that others practice tax avoidance have a significantly lower tax morale than others. He also finds lower tax morale in South America and Mexico than in the Central American or Caribbean regions; individuals in South America have a lower tax morale than those in Central America, by 10 percentage points, and individuals in Mexico have an especially lower tax morale (20 percentage points) than those in Central America. Also, Torgler (2005) finds that, if individuals say that they trust that others will obey the law, if they say that they have trust in government officials, and if they say that they have “pride” in their country, then tax morale increases significantly. Individuals who are older, married, self-employed, salaried, and heads of a household tend to have a higher tax morale. Of

special importance, individuals who are more supportive of democratic government also have a higher tax morale. Torgler (2005) also finds that there is a significant positive correlation between tax morale and the size of the shadow economy.

The structural features of the tax system, including its administration aspects, also seem likely to be important determinants of the fiscal gap, and these basic structural features must be identified: what is taxed (e.g., income, consumption, wealth), what is exempted from taxation, and what are the rate structures of the various taxes? Some taxes are inherently harder to collect than others, and individuals are more resistant to some taxes (and some rate structures) than others. These structural features are explored in more detail later.

## **9. What can be done to address the problem?**

Methods to address the broad issue of tax evasion and tax compliance fall into several main categories.

First, there is scope for an improvement in tax administration. Traditionally, there are three main aspects of tax administration: taxpayer registration, taxpayer audit, and collections. Improvements in each of these areas are feasible. For example, taxpayer registration can be increased via better use of third-party information (e.g., cross-references between tax reporting, social security records, and data from the financial system). Audits can be made more effective via adoption of modern audit technology, including more systematic selection of returns for audit. There are fairly recent good examples of this in a number of countries, such as Chile (Bergman, 2003) or Spain (Martinez-Vazquez and Sanz, forthcoming). Collections could be increased by adding interest income to the tax base for the income tax even if at reduced rates with a schedular treatment (Owens, 2006) by applying non-harsh penalties often and consistently (Alm, 1999), by facilitating payments through the banking system, by allowing for simple cross-tax deductions (e.g., of interests payments on loans or mortgages), and by relying more heavily on source-

withholding (Tanzi and Zee, 2000). These approaches are consistent with the traditional approach to taxpayer compliance, in which the taxpayer is seen mainly as a potential criminal who must be deterred from criminal activities; Alm and Martinez-Vazquez (2003) have termed this the “punishment paradigm” of tax compliance.

The administrative dimension of taxation has long been recognized by tax administrators and practitioners in a long list of country studies, and it has frequently been flagged by economists working on tax policy in developing countries (Goode, 1981; Bird, 1989; Das-Gupta and Mukhaje, 1999). As emphasized by Bagchi, Bird, and Das-Gupta (1995), it is helpful to view the tax administration process as a production function in which “inputs” like personnel, materials, information, laws, and procedures are used to produce several outputs, the most important of which is government revenue, but which also includes taxpayer satisfaction, equity, and social welfare.

This approach to tax administration reform emphasizes a variety of measures, including such traditional “punishment paradigm” policies as:

- Introducing an effective audit program that identifies individuals who do not file tax returns as well as those who underreport income or overclaim deductions and credits
- Applying non-harsh penalties often and consistently
- Using source-withholding whenever possible
- Facilitating payments through the banking system
- Making use of third-party sources of information to verify reporting behavior.

Again, these inputs view the taxpayer as a potential criminal who must be deterred from cheating.

It is also – and increasingly – the case that reforms are not limited to these traditional enforcement mechanisms that tend to emphasize detection and punishment. Instead, tax administration may be changed by introducing policies that see the taxpayer more as a client in need of services. This alternative approach to tax administration reforms leads to a different set of policies, which emphasize the provision of taxpayer services via such things as:

- Promoting taxpayer education and developing taxpayer services to assist taxpayers in every step of their filing returns and paying taxes
- Broadcasting advertisements that link taxes with government services
- Simplifying taxes and the payment of taxes

- Promoting voluntary compliance by lowering the costs for taxpayers associated with filing their taxes
- Ensuring relative stability of the tax system
- Adopting the general principle of self-assessment
- Promoting a taxpayer - and a tax administrator - “code of ethics”.

Put differently, here the taxpayer is no longer seen simply as a potential criminal but as a potential client. This new approach suggests a different paradigm for tax compliance than one that emerges from traditional analysis, what Alm and Martinez-Vazquez (2003) term a “service paradigm” of tax compliance. This second paradigm recognizes the role of enforcement, but also emphasizes the role of tax administration as a facilitator and a provider of services to taxpayer-citizens. As discussed later, this new paradigm for tax administration fits squarely with the perspective that emphasizes the role of “social norms” in tax compliance; that is, government can change tax compliance by changing the social norm of tax compliance.<sup>27</sup>

Second, there is scope for changes in tax structure (e.g., rates and bases) that can encourage more compliance. There is some evidence that lower tax marginal tax rates give incentives for greater payment of taxes (Alm, Bahl, and Murray, 1991, 1993). The effect of broader tax bases on incentives to comply is not known.

Third, the modernization and greater autonomy and specialization of tax administrations may facilitate the reorientation from the “punishment paradigm” to the “service paradigm”. The use of Semi-autonomous Revenue Authorities (SARAs) and Large Taxpayer Units (LTUs) has been shown in several countries to improve tax administration with a more service oriented approach to

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<sup>27</sup> Several of the economists who developed and extended the standard economic model of tax evasion have also examined the issue of the optimal enforcement by the tax administration agency (Sandmo, 1981; Slemrod and Yitzhaki, 1984; Usher, 1986; Kaplow, 1990; Slemrod, 1990). The important themes of this literature are two. First, tax administration and taxpayer compliance costs need to be considered in designing an optimal enforcement policy. Second, changes in tax collections stemming from changes in enforcement may be a poor guide to the optimal level of enforcement because enforcement uses up real resources in the economy while increased collections simply represent a transfer of resources. The rule for optimal tax enforcement should therefore equate the marginal enforcement cost to the marginal increase in welfare caused by the decrease in excess burdens and other costs (including “anxiety costs”) associated with tax evasion. However, with the exception of additional resource cost spent on administration and the additional revenues generated, all costs and benefits of increased tax enforcement are extremely difficult to measure. In this sense, the policy impact of the optimal enforcement literature has been limited.

tax enforcement (Silvani, 1992; Taliercio, 2004; Mann, 2004; and Baer et al. 2002). See Box 1 for a discussion of the pros and cons of adopting a SARA.

### **Box 1**

#### **Advantages and Disadvantages of Adopting a Semi-Autonomous Revenue Authority\***

An increasing number of countries around the world have been adopting an institutional setup for tax administration known as a Semi-autonomous Revenue Authority (SARA). In the LAC region Argentina, Bolivia, Colombia, Ecuador, Guatemala, Guyana, Jamaica, Mexico, Peru, and Venezuela have introduced this approach to organizing their tax administrations. Under a SARA arrangement, tax administrations – sometimes including customs departments – are separated from the Ministry of Finance and granted a semi-autonomous legal status. These agencies are typically provided personnel management systems different from those of the general civil service, especial compensation packages, different levels of self-financing and management systems responding to a board of directors with representatives of the public and private sectors. Under certain circumstances SARAs can be used to improve the performance of tax administrations from collections to audits and taxpayer services through higher skilled, merit based, and better paid employees and through more independence from political pressures and patronage. Typically, SARAs may also be provided with more financial autonomy and stability. On the other hand, SARAs have been criticized for creating an “enclave” approach to reform, for diverting focus on improving basic administration functions, for creating resentment and friction in other areas of the civil service, for reducing accountability and authority of ministries of finance. In all the value of SARAs should be assessed on the basis of the net benefits (e.g., improved compliance and collections, etc) and the costs (e.g., disruptions in the civil service, higher budgets, etc) that would bring in a country with a particular set of characteristics and institutions. Recent studies of SARAs’ performances around the world (Mann, 2004; Taliercio, 2004) conclude that even though not all SARAs have been successful in terms of improved sustained performance, well-designed SARAs with continued political support can make a significant difference in how effectively tax administrations and customs services operate.

\* Sources: Mann (2004) and Taliercio (2004).

More generally, and as suggested by our earlier discussion and critique of the difficulties of the standard economics-of-crime approach to tax compliance, we believe that societal institutions, broadly defined, have a major impact on tax evasion. Here we highlight two, as suggested by the earlier discussion.

A first institution is what might be termed the “social norm” of compliance, what we have discussed above as “tax morale”. Although difficult to define precisely, a social norm can be distinguished by the feature that it is process-oriented, unlike the outcome-orientation of individual rationality (Elster, 1989). A social norm therefore represents a pattern of behavior that is judged in a similar way by others and that therefore is sustained in part by social approval or disapproval.

Consequently, if others behave according to some socially accepted mode of behavior, then the individual will behave appropriately; if others do not so behave, then the individual will respond in kind.<sup>28</sup>

The existence of a social norm suggests that an individual will comply as long as he or she believes that compliance is the social norm. Conversely, if noncompliance becomes pervasive, then the social norm of compliance disappears.<sup>29</sup> It is also likely, though not without controversy, that the social norm of compliance differs significantly across countries. If we take “tax morale” as a measure of this social norm, then there is much evidence that tax morale differs, and differs systematically, across countries. See Torgler (2005) and Alm and Torgler (2006) for some evidence and discussion.

This perspective also suggests that, if government can affect the social norm of compliance, then such government policies represent a potentially significant tool in government's battle with tax evaders. Of course, policies to change the social norm of compliance are difficult to determine in theory. However, there is some evidence from various social sciences that suggests that these norms can be affected by government institutions and policies.

The role of process in individual and group decisions is becoming increasingly recognized. For example, there is much behavioral science evidence that implies that greater individual participation in the decision process will foster an increased level of compliance, in part because participation implies some commitment to the institution and such commitment in turn requires behavior that is consistent with words and actions. This notion implies that one dimension by which social norms can be affected is via individual participation in the decision process, say, by

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<sup>28</sup> There are other concepts that describe the same basic phenomenon as social norms and tax morale, such as “psychic cost” (Gordon, 1989), “moral sentiments” (Erard and Feinstein, 1994), “group conformity and social customs” (Myles and Naylor, 1996), and “intrinsic motivation” (Frey, 1992, 1997).

<sup>29</sup> Some degree of tax evasion exists in every country. However, when does tax evasion become the accepted norm? Practically, nothing is known about the “critical mass” or the “tipping point” of tax evasion, where the social norm of tax compliance switches to one of tax evasion. To our knowledge, no empirical research has been conducted on this important issue. There is, however, some experimental evidence that examines this issue. See Alm (2000) for a discussion.

voting. Also, survey evidence suggests that compliance is higher when taxpayers feel that they have a voice in the way their taxes will be spent. Under such circumstances, they are likely to feel more inclined to pay their taxes.

Another dimension by which social norms may be affected by government actions is related to the level of popular support for the government program. Widespread support tends to legitimize the public sector, and so imposes some social norm to pay taxes. Consequently, it seems likely that there will be more tax compliance when the public good provided to a community is popular. Survey evidence is largely consistent with this hypothesis.

Still another dimension by which social norms can be changed is the government's commitment to enforcing the tax laws. In fact, as we emphasize later, it seems likely that there is a constant interaction between social norms and tax administration. If the perception becomes widespread that the government is not willing to detect and penalize evaders, then such a perception legitimizes tax evasion. The rejection of sanctions sends a signal to each individual that others do not wish to enforce the tax laws and that tax evasion is in some sense socially acceptable, and the social norm of compliance disappears. Such an outcome is common in many countries, such as those in the LAC region, where it seems to be accepted that tax evasion is the norm. The introduction of a tax amnesty may also affect the social norm of compliance. A tax amnesty gives individuals an opportunity to pay previously unpaid back taxes without being subject to the penalties that the discovery of evasion normally brings. Such amnesties may reduce compliance if honest taxpayers resent the tax forgiveness given to tax cheats (and if individuals believe that the amnesty may be repeated again). The role of tax amnesties is discussed in more detail in Box 2.

**Box 2**  
**World-wide Experiences with Tax Amnesties\***

Governments of all kinds have frequently turned to tax amnesties as part of their fiscal programs. An amnesty typically allows individuals or firms to pay previously unpaid taxes without being subject to some or all of the financial and criminal penalties that the discovery of tax evasion normally brings. In the last twenty years, nearly forty states in the United States have enacted some form of tax amnesty, sometimes

more than once. Many other countries have also used one or more amnesties. These countries include those in all parts of the world: in Europe (Belgium, France, Ireland, Italy, Switzerland), Latin America (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Honduras, Mexico, Panama, Peru, Uruguay), Asia (India, Malaysia, Pakistan, Sri Lanka), and the Pacific (Australia, Indonesia, New Zealand, the Philippines).

The benefits and costs of a tax amnesty are many and varied. On the *Benefits* side, amnesties can:

- generate an immediate increase in tax revenues
- reduce administrative costs
- improve post-amnesty voluntary compliance through better post-amnesty recordkeeping and monitoring of individuals who previously were not on the tax roles
- improve post-amnesty voluntary compliance if the amnesty is part of a larger effort to reform the tax system with improved enforcement efforts, reasonable and equitable civil and criminal penalties, and better and more extensive taxpayer services and education.

On the *Costs* side, however, amnesties can:

- produce small and overstated amnesty revenues
- reduce post-amnesty voluntary compliance from previously honest taxpayers who view the amnesty as unfair, from individuals who are now less motivated by guilt to pay their taxes, from individuals who are now aware of the presence of noncompliance, from taxpayers who now realize that the government is unable to enforce the tax laws, and from taxpayers who anticipate that another amnesty may be given in the future.

Evidence from a large number of past tax amnesties suggests the following general conclusions:

**1. Tax amnesties typically generate only a small amount of additional tax revenue.** Revenues from a tax amnesty are generally small and, in any case, amnesty revenues are often overstated because they are from known delinquents and would likely have been collected anyway. This suggests that a tax amnesty should not be viewed as any kind of fiscal panacea. Multiple amnesties are even less successful in generating additional revenues, and they have perverse effects on voluntary compliance as taxpayers incorporate the expectation that future grace periods will occur. Furthermore, most revenues collected in an amnesty generally come from those individuals with relatively small amounts of previously unreported taxes. Hard-core evaders, or those with large amounts of evasion, typically do not participate in an amnesty at very high rates. Consequently, the ability of an amnesty to get these hard-core evaders on the tax roles seems small, which is part of the reason that amnesties rarely generate significant amounts of additional revenue.

**2. Individuals or firms are more likely to participate if a tax amnesty is accompanied by a significant change in the tax system.** Empirical evidence indicates that amnesty programs most effective in generating revenues are those that reduce taxes, interest, and penalties on items reported in the amnesty, that allow known delinquents to participate, and especially those that increase post-amnesty enforcement. Individuals will not voluntarily admit past tax evasion in a tax amnesty unless they believe that tax enforcement will be increased following the amnesty. An individual with unpaid tax liabilities has made the decision that the benefits of evasion (e.g., reduced taxes) exceed the costs (e.g., the risk of detection and punishment). If it was rational for the individual to evade taxes in the past, then in an unchanged environment it is rational for him or her to continue to evade taxes even if a tax amnesty is enacted. The individual will participate in an amnesty and report past evasion to the authorities only if he or she believes that audit and penalty rates will increase. A significant reduction in liabilities on previous evasion is also effective in encouraging participation; this reduction occurs by lowering tax rates, waiving penalties, and reducing interest charges. Also, there is some evidence that voluntary compliance generally falls somewhat after an amnesty that is unaccompanied by greater audit rates, penalty rates, and taxpayer education programs. This decline is due to a variety of factors, notably taxpayer expectations of another future amnesty and taxpayer feelings of unfair treatment of evaders. An amnesty that is followed by an enhanced enforcement regime and improved taxpayer education generally increases or at least does not decrease voluntary tax compliance.

**3. Citizens must believe that the amnesty is a one-time opportunity – the government must have**

**credibility.** To the extent that an amnesty is successful in raising revenues during and after the amnesty, citizens must believe that the amnesty is a one-time opportunity. An amnesty should not be used as an emergency-revenue measure because this will only encourage further non-compliance in anticipation of the next revenue-emergency. In addition, citizens must believe and must eventually see that the amnesty is accompanied by enhanced enforcement. At the very least an amnesty should be part of a major shift of the tax system and a reorganization of the tax administration. In fact, if increased enforcement and reorganization is already planned by the tax authorities, then a tax amnesty is an effective tool for easing the transition to a new, tougher tax regime. Such an amnesty offers several advantages: the amnesty generates some immediate tax revenue; individuals with past evasion are not locked into continued evasion; and the government both clears its ledgers of accounts receivables and adds the names of past evaders to its records. It is essential, however, that individuals believe that improved enforcement will occur.

\* Source: Alm, Martinez-Vazquez, and Wallace (2006).

In their entirety, the various influences of the social norm of compliance can be classified into two basic categories. The first relates to how the taxpayer judges his or her own compliance behavior in light of the individual's own feelings about what is proper, acceptable, or moral behavior, what might be termed “internal norms”. The second relates to whether other taxpayers are perceived as paying their fair burden of taxes and to how the taxpayer feels he or she is treated by government in such areas as the payment of taxes, the receipt of government services, or the responsiveness of government decisions (or “external norms”).

We believe that there is considerable intuitive appeal to the potential importance of social norms in tax compliance behavior.<sup>30</sup> There is strong evidence that countries with roughly the same fiscal system exhibit far different patterns of compliance; for example, see Bergman (2003) for a comparison of Argentina and Chile. There is also much survey evidence from many countries that indicates that compliance is strongly affected by the strength and commitment to the social norm of compliance.<sup>31</sup> These surveys conclude, among other things, that those who comply view tax evasion as “immoral”, that compliance is higher if a “moral appeal” to taxpayers is made by government, that the low social standing of tax evaders can be an effective deterrent, that individuals with tax evaders as friends are more likely to be evaders themselves, and that

<sup>30</sup> A growing theoretical literature has formally developed this conjecture. See, for example, Gordon (1989), Myles and Naylor (1996), Bergman (2002), and Chang and Lai (2004).

<sup>31</sup> See, for example, Westat, Inc. (1980), Yankelovich, Skelly, and White, Inc. (1984), and Harris and Associates, Inc. (1988) for the United States; Vogel (1974) for Sweden; Lewis (1979) for the United Kingdom; and de Juan, Lasheras, and Mayo (1993) for Spain.

compliance is greater in communities with a stronger sense of social cohesion. Other survey evidence suggests that some people will not pay their taxes if they dislike the way their taxes are spent, if they feel they have no say in the decision process, if they feel that government is unresponsive to their wishes, or if they feel that they are treated unfairly by government. There is also some empirical, experimental, and simulation evidence that compliance is affected by the nature of the collective decision process, at least in democratic countries (Pommerehne and Weck-Hannemann, 1989; Alm, Jackson, and McKee, 1993; Pommerehne, Hart, and Frey, 1994). It may well be that such sentiments play an important, perhaps a dominant role, in tax compliance.

However, there is not full agreement on this issue. Tanzi and Pellechio (1995) argue that the role of social norms in overall compliance is often exaggerated. In their view, given the right incentives and institutions, taxpayers would tend to behave the same, regardless of where they reside. To support their argument, they cite a number of countries (e.g., Chile, Peru, Mexico, Uganda, Ghana) where overhauls of tax administrations produced significant increases in revenue collections. However, it is not clear that these improved performances have been sustainable (e.g., Mexico's revenues eventually decreased, as documented in Martinez-Vazquez (2001)), without a deeper transformation of the fiscal exchange between governments and taxpayers (e.g., this may have been the case in Chile, as discussed by Bergman (2003)). At any rate, in our view the hypothesized impact of social norms on tax compliance does not contradict but rather has a symbiotic relationship with the strengthening and effectiveness of tax administration institutions in a country.

In summary, the investigation of the impact of social norms on compliance behavior is a promising avenue of research for understanding tax evasion in LAC countries and beyond. To the extent that these norms are influenced by the responsiveness of government to its citizens' needs and the effectiveness of government institutions, including the tax administration, the scope of government policies to combat tax evasion is significantly broader than implied by the standard

economic approach. It should not come as a surprise to many government officials in LAC countries that controlling tax evasion will require improving overall governance and delivering value for money to taxpayers-citizens.

*A second and obvious institution is, as noted above, the tax administration machinery of the government tax agency. Indeed, much of the most recent literature on tax administration reform for developing countries (Bird and Casanegra de Jantscher, 1992; Bagchi, Bird, and Das-Gupta, 1995; Tanzi and Pellechio, 1995; and Silvani and Baer, 1997) has emphasized the new “service paradigm” of the role of tax administration, as a facilitator and a provider of services to taxpayer-citizens. Some recent administrative reforms around the world have also embraced this new paradigm with great success. One of the best examples is provided by Singapore’s tax administration reform over the last decade (Bird and Oldman, 2000). The main tenet of Singapore’s reform is service-oriented: the conversion from a hard-copy filing system to a paperless imaging system, the extensive use of electronic filing, a one-stop service to answer inquires about any type of tax, the ability for filers to see the entire tax form with any corrections before it is submitted, the use of interest-free installment plans for paying taxes with direct deduction from bank accounts, separate functional areas within the tax administration with little opportunity for corruption, and a changed attitude of officials toward taxpayers. During the last decade, the tax administration service of Singapore went from being the lowest rated government agency in public satisfaction to one that ninety percent of the taxpayers found to provide courteous, competent, and convenient services. Of course, most countries, especially LAC countries, will not be able to fully imitate Singapore’s reforms. Nevertheless, there is much to be gained in improved tax compliance by reforming the tax administrations along the lines of the new paradigm.<sup>32</sup>*

*Note that the criminalization of certain tax offenses (e.g., by their inclusion in penal codes) is not uncommon around the world, having been legislated also in many developing countries. What is more unusual is the developing world is its actual application. For example, Pakistan has criminalized certain tax offenses, but these statutes do not appear to have ever been used.<sup>33</sup> On the other hand, the criminalization of tax offenses and the effective use of the new statutes in combination with a modernized tax administration agency have been credited as playing a key role, among other factors, in Spain’s success in the late 1970 and 1980s for drastically reducing tax evasion and eventually doubling the tax revenue to GDP ratio.<sup>34</sup>*

*Boxes 3, 4, and 5 illustrate the effects of government policies, and other external forces somewhat outside the control of government, on the social norm of compliance (or tax morale), looking specifically at the experiences of Spain, Russia, and Puerto Rico.*

**Box 3**  
**Fiscal Reform and Tax Morale in Spain\***

Spain has undergone fundamental changes in the role and effectiveness of the public sector since the transition to a democratic system after the death of General Francisco Franco in 1975, all of which have had a deep impact on tax morale. Besides the advent of a fully democratic state and

<sup>32</sup> Note that the available evidence from government budgetary information indicates that the budget cost of collecting individual income, business income, and sales taxes is generally in excess of 1 percent of the revenues from these taxes, and can sometimes be substantially higher (Sandford, 1995). However, there is little information on how these costs vary with various policy tools. It seems likely that the administrative costs change in large and discrete amounts with the scale of collections and that they may also display economies of scale in their collections, but these aspects of the collection cost technology are not known.

<sup>33</sup> See Martinez-Vazquez (2006).

<sup>34</sup> See Martinez-Vazquez and Sanz (forthcoming). Other key factors in Spain’s successful experience was a widespread consensus among political parties about the need for the reform of the tax system, improved democratic governance, and highly visible enhancements in social and other public services. Martinez-Vazquez and Torgler (2005) find evidence of significant changes in tax morale among Spanish taxpayers over this period.

joining the European Union, Spain has adopted major tax policy and tax administration reforms, an extensive redirection in public expenditures with the development of a social welfare system, and a significant push for decentralized governance. All these policies provide excellent benchmarks for institutional changes that are expected in the compliance literature to change the tax morale in the country. Martinez-Vazquez and Torgler (2005) use data from the World Values Survey and the European Values Survey to observe the evolution of tax morale in Spain at four benchmark years: 1981, 1990, 1995, and 1999/2000. Their findings strongly support the conjecture that during the time Spain succeeded in designing general institutional reforms, including tax policy and tax administration reforms, the country experienced significant increases in tax morale. At the individual level, Martinez-Vazquez and Torgler (2005) also find that “social capital” variables, the extent to which citizens can identify themselves with the state, and the national institutions of the country itself have played a strong positive effect on tax morale. There can be little doubt that the tremendous success of Spanish tax reforms and tax administration modernization efforts in practically doubling tax effort for general revenues in the country, from 22 percent of GDP in 1976 to 40 percent of GDP in 2002, has had much to do with the improved tax morale of Spanish citizens. Martinez-Vazquez and Torgler (2005) argue that the level of tax morale is an endogenous variable affected by, among other things, tax policy and tax administration reforms and that keeping tax morale high is a valuable asset for taxpayer compliance and the overall performance of the country’s fiscal system.

\* Source: Martinez-Vazquez and Torgler (2005).

#### **Box 4**

##### **Tax Morale in the Russian Federation Before, During, and After the Transition\***

Fundamental changes in the role and effectiveness of the public sector occurred during the transition years of the 1990s in the Russian Federation. Alm, Martinez-Vazquez, and Torgler (2007) used the dynamic changes in Russia during the transition decade of the 1990s to examine citizens’ attitudes toward paying taxes and especially to analyze the ways in which these attitudes were affected by (or reflected in) changes in government policies and institutions. They used micro-level data for Russia from the World Values Survey and the European Values Survey for the years 1991, 1995, and 1999 to examine how these attitudes changed during the tumultuous events of the 1990s.

Alm, Martinez-Vazquez, and Torgler (2007) found that tax morale decayed in the first four years of the transition from 1991 to 1995, and then exhibited a small recovery in 1999. These results are consistent with the relevance of social norms in tax compliance. The widespread perception of tax evasion along with the economic convulsions revealed inadequate social institutions, and led to an initial crowding out of the intrinsic motivation to pay taxes from 1991 to 1995. Tax morale improved following the restoration of a higher level of trust in the state in 1999 after some progress in the transition to a market economy had been made, a transition that positively influenced individual attitudes toward paying taxes. Their analysis of disaggregated data for Russian regions also shows significant regional differences in tax morale, reflecting self-interest and the degree of trust different regions have toward Moscow’s institutions and policies.

These broad swings in tax morale in the aggregate data parallel quite well what was happening to and around Russian citizens at those different periods during the transition. Although government was still providing many basic services just before the beginning of the transition process in 1991, the overall performance of the public sector was poor. From the very start of the transition at the end of 1991 and through the early months of 1992, the socio-economic conditions confronting Russian citizens suddenly deteriorated, on a massive scale, as the level and quality of public services declined even further. Large proportions of the Russian population suffered

income declines during the early 1990s. The rapid collapse of institutional structures also produced a vacuum in the country, followed by worsening income inequality and poverty rates, and taxpayers reacted adversely to the economic and tax policy changes that were necessary for the transition from a centrally controlled to a market economy. Further, in a shift from a centrally controlled to a market economy, the fiscal system needed to be reformed. Individuals were faced for the first time with the direct payment of taxes, including being asked to file different tax returns. However, voluntary compliance and self-filing, two important pillars in a modern tax system, were completely absent just after the planned socialism. The connection between the payment of taxes and the provision of public goods had been largely concealed under socialism, which might have reduced the identification with the state and thus the willingness to pay taxes. Finally, law and order were strongly violated in the former Soviet Union and later in Russia. The lack of a “rule of law” tradition did not help with the institutional transformation process or the improvement of tax morale, at least in the first phases of the transition. Corruption also increased in the early years, which reduced citizens’ trust in government authority, and corruption was likely heightened by a privatization process that lacked effective legal regulation and impartial oversight. Overall, then, in the first years of the transition, Russia did not succeed in designing tax systems, tax administrations, or other government structures and institutions (especially improved public service delivery) that would have helped to maintain tax morale.

However, there was a trend toward some improvement in tax morale from 1995 to 1999. The increase may have been influenced by the start of reform discussions related to the draft Tax Code and the Budget Code and also by some new initiatives such as the Law on Financial Foundations of Local Self-government and the Concept of Reform of Intergovernmental Fiscal Relations in the Russian Federation, both of which had the goal of increasing revenue autonomy at the subnational level. Changes in tax morale over time were also likely related to the significantly improved performance of the economy in the latter half of the 1990s. If taxpayers can relate poor economic performance to poor government policy decisions, then this will affect negatively voluntary compliance with the taxes; conversely, taxpayers may credit improved economic performance to improved government performance, and thereby increase their willingness to pay taxes.

Alm, Martinez-Vazquez, and Torgler (2007) also examined micro-level data. They found that an increase in trust in government and the legal system, and an increase in national pride, improves significantly tax morale. Individuals who are older, who are more educated, who are self-employed have a higher tax morale; the sex of the individual and the individual’s marital status were not significant determinants of tax morale. Of some importance, individuals who believed that tax evasion was pervasive had a significantly lower tax morale, which supports the conjecture that taxpayers’ judgments about the compliance of others have a strong impact on their intrinsic motivation to pay taxes.

In sum, these trends suggest several lessons for any government in its efforts to improve tax morale. A more transparent tax system, a reduction in public corruption and public waste, a stronger involvement of individuals in the political process, a more modern role of the tax administration as a provider of services, and, especially, an increase in trust in government and the legal/justice system would likely improve the compliance norm in any society, as demonstrated by the experience of the Russian Federation. Even so, the results in Russia suggest that, once tax morale is crowded out, it is difficult to raise very quickly back to previous levels.

It should also be noted that stricter enforcement of the tax laws, while an important factor improving tax morale, must be done carefully. In Russia, the early 1990s tax administration adopted highly repressive and antagonistic policies toward taxpayers, even those who wanted to comply with the tax laws, and the Russian tax enforcement strategy was strongly based on coercion methods, mainly increasing the mandate of law enforcement agents. The tax police gained increased power, and grew into a bureaucracy with around 50,000 employees, or one third of the size of the tax administration, and the number of criminal investigations by the tax police

increased from 2,500 in 1994 to 16,000 in 1999, a number that represents four times more investigations than in the United States in 1999. It took time for the federal tax authorities to realize that a strategy that emphasizes enforcement and punishment alone cannot be the only solution to improving voluntary tax compliance. Indeed, it is likely that such a strategy had a counter-productive effect. If the majority of taxpayers are not treated as responsible persons with an intrinsic motivation to pay taxes, they may soon feel that they can as well be opportunistic. Even so, such strict enforcement policies are not expected to crowd out the tax morale of honest taxpayers if honest taxpayers perceive the stricter policy to be directed mainly against dishonest taxpayers.

\* Source: Alm, Martinez-Vazquez, and Torgler (2007).

### **Box 5**

#### **Government Actions and Declining Tax Morale in Puerto Rico\***

The Puerto Rico fiscal system has undergone some major changes in recent years, changes that have been beneficial in a variety of dimensions. Nevertheless, the system is plagued by a number of problems, and many specific actions of the government of Puerto Rico have contributed to what appears to be a sizeable decline in tax morale over time, including:

- The quality of public expenditures in such basic areas as education, public infrastructure, and security is so lacking that many individuals and businesses have resorted to using their own resources to ensure adequate services.
- The current tax system is an outdated and an ad hoc system, as tax policy has, apparently and increasingly, become focused on accommodating the requests of specific individuals and of specific sectors of the economy and as the tax system has failed to evolve to reflect the changing economic circumstances of governments in small, open economies.
- The government has allowed tax evasion to persist, even to grow.
- Even aside from tax evasion, the government has allowed the tax base to be narrowed via administrative actions like exemptions or preferential treatments.
- There is widespread use of tax incentives, especially in the corporate income tax.
- There are significant limitations in tax administration, as indicated in part by the extent of tax evasion.
- The tax system is excessively and unnecessarily complex, which magnifies the limitations in tax administration.
- Of perhaps most significance for the decline in tax morale, there are significant horizontal and vertical inequities in taxation:
  - Individuals who work in the formal sector of the Puerto Rico economy are subject to employer withholding on their wage income, while those who are self-employed or who work in the informal sector are much less likely to pay the personal income tax.
  - Some individuals receive non-taxable benefits from their employer while others do not receive them or receive them at a lower rate.
  - Some consumers face very different effective excise tax rates than others, given the uneven pattern of exemptions on the excises.
  - The corporate income tax discriminates among firms, largely because of the existence of tax preferences that are available to some firms and sectors and not to others.
  - In addition to the formal administrative provisions for tax relief, there is discretionary relief on a case-by-case basis.
  - Although effective rates of individual income taxation increase with income, there has been a significant decline in the actual degree of progressivity over time, and the degree of effective progressivity is considerably less than that implied by the

statutory rate structure in the income tax.

Based upon the experience of other countries, reforms of the current Puerto Rico tax system that would improve its overall functioning and would also improve tax morale include:

- Changing the tax structure, not increasing tax effort
- Changing the composition of taxation toward more reliance on indirect taxation
- Simplifying the tax system, especially in the ways in which tax incentives are used
- Expanding the bases of the various taxes, especially those of the individual and the corporate income taxes, thereby reducing the burden on wage earners in the formal sector, allowing reductions in the marginal tax rates, and reducing the distortions now present in the tax system
- Improving tax administration by such means as relying more heavily on source withholding, updating penalties, using computerization to integrate more fully third-party sources of information, improving audit coverage by the use of quicker, less intensive audits, avoiding tax “gimmicks” like tax amnesties, and creating a more stable tax environment by avoiding frequent changes in tax laws.

\*Source: Alm (2006).

### **10. Conclusions: How can tax evasion be reduced?**

*Tax evasion is among the most vexing problems in LAC countries. Our motivation for this paper has been to examine what we have learned from the analyses of tax evasion and what we can apply from these lessons to reducing the problem of tax evasion in LAC countries. Our general conclusion on this last issue is simple and basic. Institutions matter everywhere, but they are especially decisive in developing countries where their quality is generally lower than in developed countries. Because of the crucial role of such institutions, improving tax compliance requires focusing primarily upon improving societal institutions, especially the social norm of compliance (or tax morale) and tax administration itself.*

In sum, we believe that societal institutions, such as the social norm of compliance and the presence of an effective tax administration, are critical in understanding tax compliance issues in LAC countries and beyond. From a policy viewpoint, it would appear that it may be equally important to strengthen the social norms of compliance as to improve and modernize a service-oriented tax administration.

In this regard, recent work by Gould (1996) emphasizes that it is grossly misleading to represent a complex system by a single, so-called representative agent, who behaves in some average or typical way. Instead, most systems have incredible variety – or a “full house” of individual behaviors – and the proper understanding of any system requires recognition of this basic fact. Indeed, Gould (1996) argues that the way in which a system changes over time is attributable largely to changes in the amount of variation within the system, rather than to changes in some largely meaningless “average” behavior across its individual members.

This lesson is especially apt for tax compliance. People exhibit a remarkable diversity in their behavior. There are individuals who always cheat and those who always comply, some who behave as if they maximize the expected utility of the tax evasion gamble, others who seem to overweight low probabilities, individuals who respond in different ways to changes in their tax burden, some who are at times cooperative and at other times free-riders, and many who seem to be guided by such things as social norms, moral sentiments, and tax equity. Any government approach toward tax compliance must address this “full house” of behaviors in devising policies to ensure compliance. Consequently, a government compliance strategy based only on detection and punishment may well be a reasonable starting point for tax administration but not a good ending point. Instead, what is needed is a multi-faceted approach that emphasizes enforcement, but that also emphasizes the much broader range of actual motivations that explain why people pay taxes.

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Table A-1 Personal Taxation in LAC Countries

## Individual Income Tax

Country	Range and Number of Brackets <sup>a</sup>	Taxable Income	Exemptions	Deductions	Tax Credits
Argentina	9%-35% (7)	All remuneration paid in cash or in kind.	Capital gains and interest on savings, term deposits and gov. bonds.	- Businesses: losses, expenses and social security contributions. - Several non-business expenses - Allowances: differ for spouse, child, other dependents, employees, and self employed. Are reduced with income.	For income taxes paid abroad on foreign-source income
Bolivia	13% on salaries (flat); 12.5% other income (1)	Salaries and any form of income earned as an employee.	Capital gains	- Businesses: no deductions - Non-business: social security taxes paid - Allowances: two minimum salaries	VAT paid; 13% of two minimum salaries per month
Brazil	15%-27.5% (3)	Salary, bonuses, premiums, allowances, etc.	Some expenses incurred by the employer.	- Businesses: no deductions - Several non-business expenses - Allowances: flat for each dependent	Income taxes paid in country with tax treaty.
Chile	5% to 40% (8)	Salary minus social security contributions.		- Businesses: all expenses incurred in employer's interest. - Non-business: social security contributions. - Allowances: no	Income taxes paid in country with tax treaty.
Colombia	0.26% to 35% (132)	Salary, bonuses, living and housing allowances, etc.	Contributions to the pension system, and savings for housing.	- Businesses: no deductions - Non-business: mortgage interest paid in Colombia (or prepaid medical assistance and educational expenses) and some donations. - Allowances: no	Taxes paid abroad (for residents)
Costa Rica	10% to 25% (5)	Any form of remuneration plus interests and rental income.	Any income earned abroad, capital gains.	- Businesses: Self-employed individuals may deduct up to 25% of the gross income. - Non-business expenses: the amount of mandatory year-end bonus not exceeding 1/12 of net salary. - Allowances: differ for spouse and child.	Personal allowances
Dominican Republic	15% to 30%	Entire remuneration for personal services.	Interest from time deposits, savings accts, and others.	Businesses: expenses incurred in the production of business activities. Non-business expenses: no Allowances: one standard deduction.	No
Ecuador	5% to 25% (6)	Total compensation	Occasional capital gains, dividends and interest on savings.	- Businesses: expenses incurred in order to generate, maintain, or improve taxable Ecuadorian-source income. - Non-business expenses: social security conts. - Allowances: no	Income taxes paid in another country.
Guyana	20% to 33.3%	Benefits and allowances from employment.	Capital gains from public companies.	- Businesses: all expenses related with income. - Non-business expenses: no - Allowances: one standard deduction.	Income taxes paid in country with tax treaty.
Honduras	10% to 25% (5)	Salary, bonuses, living and housing allowances, etc.	Income from investment in government's bonds pensions.	- Businesses: representation expenses. - Non-business expenses: educational and medical expenses; and some donations (educational and charitable). - Allowances: no	No
Mexico	3% to 29% (5)	Salaries, commissions, and allowances of all types.	Fringe benefits, some capital gains.	- Businesses: no - Non-business expenses: unreimbursed medical, dental, funeral expenses, some charitable conts., health insurance premiums, mortgage interest, and some retirement accounts. - Allowances: foreign income tax paid on foreign-source taxable income.	Low-income tax credit.
Nicaragua	10% to 30% (6)	Salary, bonuses, housing and allowances, etc.	Interest from savings, and dividends.	- Businesses: all deductible. - Non-business expenses: no - Allowances: no	No
Panama	4% to 30% (11)	Salary, premiums, profits compensation s in kind, etc.		- Businesses: 25% of fixed allowances from representation expenses. - Non-business expenses: mortgage interest paid, medical expenses, educational insurance tax, some donations, and contributions to public funds. - Allowances: fixed, but differ for married and non-married, and by child.	50% of VAT paid.
Peru	15% to 30% (3)	Any payment in cash or in kind.	Occasional capital gains and fringe benefits.	- Businesses: no - Non-business expenses: rentals, royalty payments and independent professionals apply different rates. Donations are also deductible. - Allowances: one standard deduction.	Income taxes paid abroad.
Uruguay	No income tax on individuals				

Venezuela	6% to 34% (8)	Any remuneration for personal service, plus capital gains and dividends.	Pensions and termination benefits.	Businesses: Some expenses, travel expense reimbursements and limited representation allowances. Business deductions from salary income are not allowed. Non-business expenses: rentals, royalty payments and independent professionals apply different rates. Donations. Allowances: standard amount for worker, spouse and child.	Income taxes paid abroad.
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<sup>a1</sup> The exempt income bracket is included.

### Other Individual Taxes

Country	Social Security Contributions		Employee	Local Tax	Wealth Tax
		Employer			
Argentina	Pension Fund	10.17 or 12.71	5 or 11	Provincial tax: self-employed indivs. on gross earnings. 3% in the Federal Capital, where professionals are exempted.	0.5%-0.75% on the worldwide personal assets without consideration of liabilities.
	Family Allowance Fund	5.33 or 6.67	—		
	Social Health	6	3		
	Social Services	1.50 or 1.62	3		
	Total social tax	23 or 27	11 or 17		
Bolivia	Pension Fund (private)		12.21	12.5% of income from independent activities and local investments.	
Brazil	Social Security		7.65 to 11	No	No
Chile	Pension Fund (private)		13	No	No
	Health		7		
Colombia	Pension, health and professional risks:	11.6	3.9 to 5.9	No	No
Costa Rica	Social Security		9	No	No
	Self-employed:		4.75 to 7.75		
Dominican Republic	Social Security	6.42	2.58	No	No
	Technical education	1			
Ecuador	Social Security		9.35	No	No
	Professional fee-based		17.50		
Guyana	Social Security	5.2	7.2	Property tax	On net asset worth
Honduras	Social Security	7	3.50	1.5 to 5.25 (9 brackets)	No
	Social Housing Fund	1.5	1.5		
	Professional Formation	1			
Mexico	Social Security (varying rates), maximum:	US\$8,065	US\$1,060	Relatively low rate of tax on salaries	No
Nicaragua	Social Security	15	6.25	No	No
Panama	Social Security		7.25	No	No
	Educational insurance tax	1.25 to 2.75			
Peru	National (or Private) Pension Fund		13	No	No
	Health System		9		
Uruguay	Retirement contributions	12.50	15	No	No
	Health insurance	5	3		
	Payroll tax	1	0,2		
	Labor restructuring	0.125	0.125		
Venezuela	Mandatory Social Security	10	4	No	No
	Employee Benefit Regimen	2	0,5		
	Housing and Habitat Benefit Regime	2	1		
	Labor Health and Security Benefit Regime	0,75 to 10			
	National Employee Training Program a	2			

Source: PricewaterhouseCoopers' Worldwide Tax Summaries Online (December 2006).

**Table A-2 Business Taxation in LAC Countries****Corporate Income Tax**

Country	Base	Rate	Income Determination	Deductions
Argentina	Profits	35%	Inventory valuation is based on the latest purchase. Capital Gains and Foreign Income are taxed. Stock dividends exempt.	Straight line depreciation. Buildings: 2% per year. Losses can be carried forward. Some tax payments, Donations, Director's Fees, etc.
Bolivia	Profits	25%	Foreign Income Exempted.	Standard depreciation applies. Some tax payments. Loss carryforward.
Brazil	Taxable Income	15% + 10% surcharge if applies	Inventory valuation by actual average cost. LIFO not accepted. Capital gains and foreign income are taxed. Stock dividends exempted.	Straight-line depreciation. Rates: 10% for machinery, equipment, furniture and installations; 20% for vehicles; and 4% for buildings. Loss carryforward. Some tax payments.
Chile	Taxable Income	16-5 - 35%	Inventory valuation: LIFO not allowed. Capital gains and foreign income are taxed. Stock dividends exempt.	Straight line Depreciation based on assets useful life. Loss carryforward. Some tax payments.
Colombia	Taxable Income	38.50%	Standard inventory valuation methods. Capital gains taxed at 35%. Foreign income taxed. Stock dividends exempt.	Straight line Depreciation based on assets useful life. Loss carryforward. Some tax payments.
Costa Rica	Taxable Income	30.00%	Inventories valued using (FIFO), (LIFO) and weighted-average cost methods. Capital gains and foreign income excluded. Stock dividends taxed at 15%	Straight-line and sum-of-the-years-digits methods, rates from 2-10%. Loss carryforward. Some tax payments.
Ecuador	Profits	15-44%	Inventories valued using (FIFO), (LIFO) and weighted-average cost methods. Capital gains and foreign income are taxed. Stock dividends exempted.	Straight-line depreciation, rates from 5-33%. Loss carryforward 5 years. Some tax payments.
Guatemala	Two options: a. Gross Corporate Income b. Taxable Income (Optional)	5%  31%	Capital gains taxes:10% in the General Regime, 31% in the Optional Regime (flat tax). Capital losses can be netted only against capital gains.  Inter-company dividends are not subject to income tax withholdings if Guatemalan income tax has been paid. Foreign Source Income is generally exempt. Stock dividends subject to a 3% stamp tax upon dividend payment.	Straight-line Depreciation. Rates (%):  Buildings 5; Machinery and equipment 20; Vehicles 20; Computer equipment and software 33.33; Other 10
Honduras	Worldwide Income	25%	Inventories valued using (FIFO), (LIFO) and weighted-average cost methods. Capital gains taxed at 10%. Losses can not be carried back	Straight-line basis. Maximum Rates (%): Buildings 2.5 to 10%; Plant and machinery 10%; Vehicles 10 to 33%; Equipment 10%
Mexico	Taxable Income	29%	Inventories valued using (FIFO), (LIFO) and weighted-average cost methods. Inter-company dividends exempted. Foreign source income taxed. Double taxation reduced by tax credits. Stock Dividends taxed at 29%.	Straight-line Depreciation. Losses may be deducted from income ten subsequent years. Some Tax Payments.
Nicaragua	Taxable Income	30%	Inventories valued using (FIFO), (LIFO) and weighted-average cost methods.  Capital Gains and Losses taxed. Foreign Income Exempted. Stock dividends exempted for residents.	Straight-line Depreciation.  Buildings (3-10); Vehicles (12-20), Plant and Equipment (10-20); Other (10-20). No loss carrybacks. Some tax payments.
Panama	Taxable Income	30%	Inventories valued using LIFO, weighted-average cost methods, specific cost, etc. Capital gains taxed by formula. Foreign income and stock dividends are exempted.	Straight-line Depreciation, sum of digits or declining balance. Carryback losses allowed.
Paraguay	Taxable Income	25-30%	Inventories valued using LIFO, weighted-average cost methods, specific cost, etc. Capital gains taxed at 30%. Foreign income and stock dividends exempted.	Depreciation rates 2.5-25%. Loss carry forward allowed. Some tax payments.
Peru	Taxable Income	30%	Inventories valued using FIFO, average, specific-identification, retail, and normal or base-stock methods. LIFO not permitted. Capital Gains taxed at 30%. Foreign Income taxed, tax credits granted thereafter.	Main depreciation rates: Vehicles 25%; Machinery and equipment 20%; Data-processing equipment 25%; Buildings 3%. Losses can be carried forward. Some tax payments.
Uruguay	Net Income	30%	Inventory valuation: Replacement cost, FIFO, LIFO or average. Capital gains are treated as ordinary income. Foreign income and stock dividends exempted.	Depreciation Rates: 2% urban buildings, 3% rural buildings; no more than 10% for new vehicles. Losses may be carried forward. Income and capital taxes are not deductible.
Venezuela	Taxable Income	15-24%	Inventories valued using LIFO, weighted-average cost methods, specific cost, etc. Capital gains are treated as ordinary income. Foreign income and stock dividends are taxed.	Straight-line Depreciation, sum of digits or declining balance. Losses may be carried forward. Some tax payments.

Source: PricewaterhouseCoopers Worldwide Tax Summaries Online (December 2006).

**Other Taxes on Corporations**

Country	Real Estate		Withholding Tax		Other Taxes
	Base	Rate	Base	Rates	
Argentina			Payments to Residents (Interests and Royalties)	6-28%	Turnover tax, Excise tax, Tax on Credits and Debits from bank accounts.

			Payments to non-residents (Interests and Royalties)	12-28%	
Bolivia			Payments to non-residents (Interests and Royalties)	12.50%	Excise tax, Hydrocarbon tax, Gross income tax.
Brazil			Payments to non-residents (Interests and Royalties)	10-25%	Social security, social integration, financial transactions.
Chile			Payments to non-residents (Interests and Royalties)	35%	Excise tax
Colombia	Land and buildings, estimated commercial value		Payments to non-residents (Interests and Royalties)	40%	Remittance, gross income tax, stamp tax, financial transactions.
Costa Rica	Land and buildings, appraised value registered	0.25%	Payments to non-residents (Interests and Royalties)	15-25%	Franchise tax, Selective consumption tax.
Ecuador	Land and buildings, estimated commercial value	0.25 to 5 per thousand	Payments to non-residents (Interests and Royalties)	25%	Special consumption Tax, Assets Tax.
Guatemala	Declared Property Value	0.2-0.9%	On payments to non domiciled foreign corporations or individuals	Dividends, earnings (1) 10%; Salaries 10%; Interest (2) 10%; Fees, royalties 31%	Stamp tax, annual business tax.
Honduras	Real Estate Value (Corporations only)	0.00015-0.0003	Payments to foreign corporations or individuals/Taxes (Gross Income) Payments to Residents	Interest 5%; Leasing 30%; Mining Royalties 10%; Salaries and Services 35% Wages, salaries and other remuneration 0-29; Dividends Nil; Sporadic payments 20	
Mexico					Compulsory profit sharing; Excise tax.
Nicaragua	Fiscal Appraisal Value	1%	Royalties, interest, and technical service fees (Residents)	2%	Selective consumption tax; Registration tax.
Panama			Payments to Residents	10%	Annual company tax; license tax, selective consumer tax, complementary tax.
			Payments to Foreigners	6-10%	
Paraguay	Fiscal Valuation	1%			
Peru			Domestic Corporations	Interest from credits granted by foreign affiliates 30%; Royalties 30%; Other income received by non-domiciled recipients 30%	Excise tax
Uruguay			Payments to Foreigners	Royalties: 30%	Capital Tax, Tax on Commissions.
Venezuela			Payments to Residents Payments to non-residents	Royalties, Commissions, Professional fees 3-5% Royalties, Commissions, Professional fees 5-34%	

Source: PricewaterhouseCoopers. Worldwide Tax Summaries Online (Dec. 2006)

**Table A-3. General Consumption Taxes in LAC Countries**

Country	VAT/Sales Tax <sup>a</sup> Base: Goods and Services	
	Rate	Main Exemptions/Zero Rating
Argentina	21%	Exports
Bolivia	15%	Exports
Brazil	10% to 15%(a)	Exports
Chile	18%	Exports
Colombia	16%	Exports, basic goods
Costa Rica	13%	Land, buildings, exports, medicines and veterinary products
Ecuador	12%	Agricultural goods and machinery; Medicines; Fertilizers; Exports; Books
Dominican Republic	12%	Exports, living essentials, some services. Advertisement taxed at 6%.
Guatemala	12%	Imported machinery; Banking services; stocks and bonds; interests from bonds; exports; donations.
Honduras	12%	n/a
Mexico	15%	Food and Medicines (0%), Education, Land trade, residential construction, interest paid by banks, medical services, education, etc.
Nicaragua	15%	Medicines, real estate transfer, basic food products; credit instruments, tuition, textbooks, and educational supplies
Panama	5%	Food, Medicines, Education, Exports
Paraguay	10%	Selling land and buildings, goods of the basic basket, farming products, pharmaceutical products and loans taxed at 5%
Peru	19%	n/a
Uruguay	14% and 23%	n/a
Venezuela	14%	Food; Fertilisers, Medicines, Books, Vehicles for passenger transport, Machinery for agribusiness. Education, health care, housecleaning, etc.

<sup>a</sup> The tax rate is the General Rate,

Source: PricewaterhouseCoopers' Worldwide Tax Summaries Online (December 2006).

**Table A-4. Indicators for Paying Taxes, Tax Revenue Collections, and GDP per capita for LAC Countries in Recent Years**

<b>Tax Indicators</b>	<b>LAC</b>	<b>Argentina</b>	<b>Bolivia</b>	<b>Brazil</b>	<b>Chile</b>	<b>Colombia</b>	<b>Costa Rica</b>	<b>Ecuador</b>	<b>El Salvador</b>	<b>Guatemala</b>
<b>Paying Taxes <sup>a)</sup></b>										
payments (number)	41.3	34	41	23	10	68	41	8	66	50
time (hours)	430	615	1080	2600	432	456	402	600	224	294
total tax rate (% profit)	49.10	116.80	80.30	71.70	26.30	82.80	83.00	34.90	27.40	40.90
Tax rates (% of managers surveyed ranking this as a major business constraint) <sup>b)</sup>				84.50				38.10	22.60	56.50
Time to prepare and pay taxes (hours) <sup>a)</sup>	549	580	1,080	2600	432	432	402	600	224	260
<b>GDP <sup>c)</sup></b>										
GDP per capita, PPP (constant 2000 international \$)	7048.92	11981.74	2400.15	7278.55	9333.64	6460.84	8161.34	3468.34	4547.62	3888.33
GDP per capita, PPP (current international \$)	7118.37	12080.46	2423.98	7350.50	9462.92	6518.93	8258.69	3504.46	4591.70	3925.32
Agriculture, value added (% of GDP)	7.70	7.02	15.65	8.69	6.18	13.62	10.49	11.10	11.45	23.16
GNI per capita, PPP (current international \$)	6892.83	11648.18	2350.91	7116.36	8982.73	6323.64	7893.64	3310.91	4500.00	3879.09
Mining and quarrying, value added (current 000 000U S\$)	-	6033	526	-	6837	4734	-	-	-	-
GDP (current 000 000U US\$)	1,928,444	229,670	8128	644,181	79,807	93,327	15,535	24,097	13,138	21,222
<b>Tax Revenues <sup>c)</sup></b>										
Tax revenue (% of GDP)	11.85	12.18	13.75	11.65	16.24	13.23	12.64		10.95	9.54
Taxes on goods and services (% of revenue)	39.55	27.84	39.08	22.34	47.57	31.29	38.37		40.77	56.04
Taxes on goods and services (% value added of industry and services)		5.51	12.29	6.76	11.71	7.00	10.05		7.60	7.38
Taxes on income, profits and capital gains (% of revenue)	17.28	15.99	6.69	18.79	20.20	32.70	12.87		21.01	23.01
Taxes on income, profits and capital gains (% of total taxes)		21.65	11.26	38.45	26.62	43.87	21.68		30.22	24.36
Taxes on international trade (% of revenue)	6.17	15.30	3.41	2.74	3.72	5.73	7.00		7.17	13.85
Total tax payable by businesses (% of gross profit)	54.47	97.90	64.00	147.90	46.70	75.10	54.30	33.90	32.20	53.40

Tax Indicators	LAC	Guyana	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Suriname	Uruguay	Venezuela, RB
<b>Paying Taxes <sup>a)</sup></b>											
payments (number)	41.3	45	48	49	64	59	33	53	17	41	68
time (hours)	430	288	424	552	240	560	328	424	198	300	864
total tax rate (% profit)	49.10	44.20	51.40	37.10	66.40	52.40	43.20	40.80	27.80	27.60	51.90
Tax rates (% of managers surveyed ranking this as a major business constraint) <sup>b)</sup>		16.70	35.60		34.70						
Time to prepare and pay taxes (hours) <sup>a)</sup>	549	288	424	536	240	424	328	424		300	864
<b>GDP <sup>c)</sup></b>											
GDP per capita, PPP (constant 2000 international \$)	7048.92	4071.05	2547.51	8574.87	3210.33	6071.70	4616.90	4838.29		8575.75	5730.67
GDP per capita, PPP (current international \$)	7118.37	4107.32	2567.75	8668.38	3241.48	6147.80	4642.62	4892.48		8639.57	5761.87
Agriculture, value added (% of GDP)	7.70	33.98	16.89	4.69	21.30	7.51	24.30	9.71	11.85	7.98	4.72
GNI per capita, PPP (current international \$)	6892.83	3799.09	2484.55	8444.55	3055.45	5823.64	4657.27	4730.00		8449.09	5626.36
Mining and quarrying, value added (current 000 000U S\$)	-	94	86	6941	32	-	31	-	66	48	15,934
GDP (current 000 000U US\$)	1,928,444	719	5866	533,376	3,889	11,637	7842	58,886	949	17,851	98,513
<b>Tax Revenues <sup>c)</sup></b>											
Tax revenue (% of GDP)	11.85			10.87	13.74	11.00	10.28	13.16		17.80	13.12
Taxes on goods and services (% of revenue)	39.55			58.27	45.81	8.91	36.53	42.82		40.25	28.71
Taxes on goods and services (% value added of industry and services)				9.76	13.37	2.64	7.76	9.10		11.74	6.70
Taxes on income, profits and capital gains (% of revenue)	17.28			31.92	11.84	18.12	12.26	19.71		10.84	24.92
Taxes on income, profits and capital gains (% of total taxes)				42.21	18.56	39.07	19.14	26.16		17.11	38.29
Taxes on international trade (% of revenue)	6.17			4.06	6.41	8.57	12.55	7.95		3.91	7.37
Total tax payable by businesses (% of gross profit)	54.47	20.70	43.20	31.30	54.30	32.90	37.90	50.70		80.20	48.90

Source: the WorldBank Notes: a) 2005, b) averages 2002-2005 c) averages 1995-2005

**Table A-5. Tax Effort Regressions for Selected LAC Countries****Tax Effort Regression (Average of 1990s)**

Dependent Variable: Tax Ratio to GDP				
Method: Least Squares				
Included observations: 105				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	17.61901	2.511518	7.015284	0.0000
Agriculture to GDP ratio	-0.169424	0.048650	-3.482521	0.0007
Per Capita GDP	9.14E-06	0.000115	0.079156	0.9371
Population Growth	-0.428311	0.881766	-0.485742	0.6282
Trade to GDP ratio	0.033353	0.017259	1.932479	0.0561
R-squared	0.212271	Mean dependent var		16.88813
Adjusted R-squared	0.180762	S.D. dependent var		7.029267
S.E. of regression	6.362316	Akaike info criterion		6.585110
Sum squared resid	4047.906	Schwarz criterion		6.711489
Log likelihood	-340.7183	F-statistic		6.736792
Durbin-Watson stat	1.657464	Prob(F-statistic)		0.000077

**Tax Effort Regression (Average of 2000-04)**

Dependent Variable: Tax Ratio to GDP				
Method: Least Squares				
Included observations: 98				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	13.96209	1.893823	7.372439	0.0000
Agriculture to GDP ratio	-0.035023	0.076315	-0.458924	0.6474
Per Capita GDP	0.000153	7.69E-05	1.993611	0.0491
Population Growth	-0.737223	0.728769	-1.011601	0.3144
Trade to GDP ratio	0.037799	0.014835	2.547856	0.0125
R-squared	0.141403	Mean dependent var		17.28516
Adjusted R-squared	0.104474	S.D. dependent var		7.695281
S.E. of regression	7.282214	Akaike info criterion		6.858420
Sum squared resid	4931.850	Schwarz criterion		6.990306
Log likelihood	-331.0626	F-statistic		3.829069
Durbin-Watson stat	1.385679	Prob(F-statistic)		0.006318

**Table A-6. Bribery in Tax Administration: Survey Evidence for LAC Countries (2005-2006)**

Indicators	Latin America and Caribbean	Brazil	Chile	Costa Rica	Ecuador	El Salvador	Guatemala	Guyana	Honduras	Nicaragua
<b>Informality</b>										
Sales amount reported by a typical firm for tax purposes (%)	76.51	67.35	98.24	71.63	79.76	76.95	77.83	73.82	68.4	66.42
<b>Bribery and Tax Administration</b>										
Unofficial payments for typical firm to get things done (% of sales)	1.2		0.31	2.25	2.83	1.14	2.56	0.43	1.72	1.77
Firms expected to give gifts in meetings with tax inspectors (%)	30.4	9.93	1.59	0	1.44	0.82	17.5	5.41	4.35	12.79
Pays Bribes to get things done (% firms)	36.3		10.38	33.8	56.18	29.97	48.57	20	45.93	31.72
Firms expected to give gifts to get an import license (%)	14.6	4.98	1.12		9.09	6.56	9.02	8.33	8.96	6.12
Value of Gifts for tax inspector (% sales)	0				0	0	0	0	0	0.01
Average time firms spent in meetings with tax officials (days)	3.5		1.69	0.53	5.91	3.61	3.12	1.3	2.53	5.51

Source: The World Bank, Enterprise Surveys 2005-2006, <http://www.enterprisesurveys.org/>

**Table A-7. Bribery in Tax Administration: Survey Evidence for Different Regions Around the World, 2005-2006**

Indicators	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	OECD	South Asia	Sub-Saharan Africa
<b>Taxes</b>							
Average time firms spent in meetings with tax officials (days)	4.91	2.78	<b>2.89</b>	3.52	1.65	3.37	5.08
Time to prepare and pay taxes (hours)	270.06	437.92	<b>548.80</b>	281.36	197.19	331.71	394.00
<b>Corruption</b>							
Unofficial payments for typical firm to get things done (% of sales)	1.81	0.76	<b>1.48</b>	2.72	0.13	1.28	1.64
Firms expected to give gifts in meetings with tax inspectors (%)	33.59	42.84	<b>30.4</b>	40.09	28.26	44.27	18.86
Value of gift expected to secure government contract (% of contract)	1.82	1.36	<b>4.08</b>	1.3	0.55	2.04	3.52
<b>Trade</b>							
Average time to clear direct exports through customs (days)	3.71	3.3	<b>4.45</b>	5.14	4.63	6.25	4.09
Average time to claim imports from customs (days)	4.89	3.92	<b>8.59</b>	10.3	5.28	9.46	7.68
<b>Informality</b>							
Sales amount reported by a typical firm for tax purposes (%)	69.3	89.35	<b>76.51</b>	73.55	93.55	93.7	78.39

Source: The World Bank Enterprise Surveys 2005-2006, available at <http://www.enterprisesurveys.org/>.

**Table A-8 Average Time Firms Spent in Meetings with Tax Officials (in days) in LAC Countries, by Firm Characteristics**

	Chile	Costa Rica	Ecuador	El Salvador	Guatemala	Guyana	Honduras	Jamaica	Nicaragua
Average	1.69	0.53	5.91	3.61	3.12	1.3	2.53	1.79	5.51
<b>Firm Size</b>									
Small (1-19 employees)	1.28	0.29	5.69	2.66	1.13	0.99	1.63	1.79	3.91
Medium (20-99 employees)	1.48	0.89	4.61	3.77	2.60	1.61	2.63	1.81	7.93
Large (100+ employees)	2.42	1.08	9.24	5.22	8.11	2.55	4.44	1.89	10.83
<b>Exporters vs Non Exporters</b>									
Exporter	2.46	1.08	6.16	4.14	6.21	1.23	4.03	2.07	6.85
Non-Exporter	1.45	0.40	5.85	3.37	1.99	1.30	1.99	1.74	5.33
<b>Domestic vs Foreign</b>									
Domestic	1.66	0.48	5.57	3.63	2.87	1.26	2.19	1.79	5.07
Foreign	1.86	1.03	8.41	3.36	5.36	2.33	4.43	n/a	9.85
<b>Sectors</b>									
Auto and auto components		n/a							
Chemicals and pharmaceuticals	1.38		6.74	4.87	4.16	n/a	5.26	n/a	8.64
Electronics		n/a							
Food	2.39	0.54	5.60	3.79	5.45	1.35	1.93	1.62	8.62
Garments		0.27	4.61	3.13	3.32	0.44	3.04		2.60
Hotels and restaurants								n/a	
Leather		0.86	7.42	2.89	n/a				2.53
Metals and machinery	1.45	0.59	3.96	4.26	2.08		1.62	n/a	7.51
Non-metallic and plastic materials		0.58	5.95	3.31	1.26		2.81	n/a	5.24
Other manufacturing	1.89	0.72	7.91	0.57	2.17	0.67	1.30	1.11	7.17
Other services	1.36							n/a	
Retail and wholesale trade									
Textiles		0.50	6.42	2.60	2.63	0.33	5.75	2.63	6.07
Wood and furniture	1.41	0.35	7.64		1.81	1.79	2.15	1.13	3.97
Other	2.07							1.40	

Source: The World Bank Enterprise Surveys 2005-2006, available at <http://www.enterprisesurveys.org/>.

**Table A-9. Firms in LAC Countries Expected to Give Gifts in Meetings with Tax Inspectors (in percent), by Firm Characteristics**

	Brazil	Chile	Costa Rica	Ecuador	El Salvador	Guatemala	Guyana	Honduras	Nicaragua
Average	9.93	1.59	0	1.44	0.82	17.50	5.41	4.35	12.79
<b>Firm Size</b>									
Small (1-19 employees)	8.15	3.21	0	0	0	9.09	6.06	0	12.77
Medium (20-99 employees)	11.17	1.14	0	2.34	1.03	23.08	6.25	0	12.50
Large (100+ employees)	8.76	0.58	0	1.85	1.72	18.75	0	11.11	14.29
<b>Exporters vs Non Exporters</b>									
Exporter	6.88	2.08	0	0	1.23	25	10	11.11	10
Non-Exporter	10.64	1.39	0	1.80	0.61	10	3.77	0	13.16
<b>Domestic vs Foreign</b>									
Domestic	10	1.44	0	1.69	0.9	15.63	5.88	5.26	13.16
Foreign	8.96	2.30	0	0	0	25	0	n/a	10
<b>Sectors</b>									
Auto and auto components	6.02								
Chemicals and pharmaceuticals	9.38	0		0	0	n/a	n/a	n/a	0
Electronics	9.8								
Food	9.78	0	0	5.66	1.69	0	7.14	0	21.05
Garments	12.15		n/a	0	1.75	37.5	n/a	n/a	n/a
Hotels and restaurants									
Leather	9.57		n/a	0	0	n/a			20
Metals and machinery	8.94	4.12	0	2.22	0	0		n/a	7.69
Non-metallic and plastic materials			0	0	0	n/a		n/a	28.57
Other manufacturing		0	0	0	n/a	n/a	n/a	n/a	9.09
Other services		1.06							
Retail and wholesale trade									
Textiles	10.61		0	0	0	n/a	n/a	n/a	n/a
Wood and furniture	9.63	1.79	0	0		12.5	4.17	0	0
Other		5							

Source: The World Bank Enterprise Surveys 2005-2006, available at <http://www.enterprisesurveys.org/>.

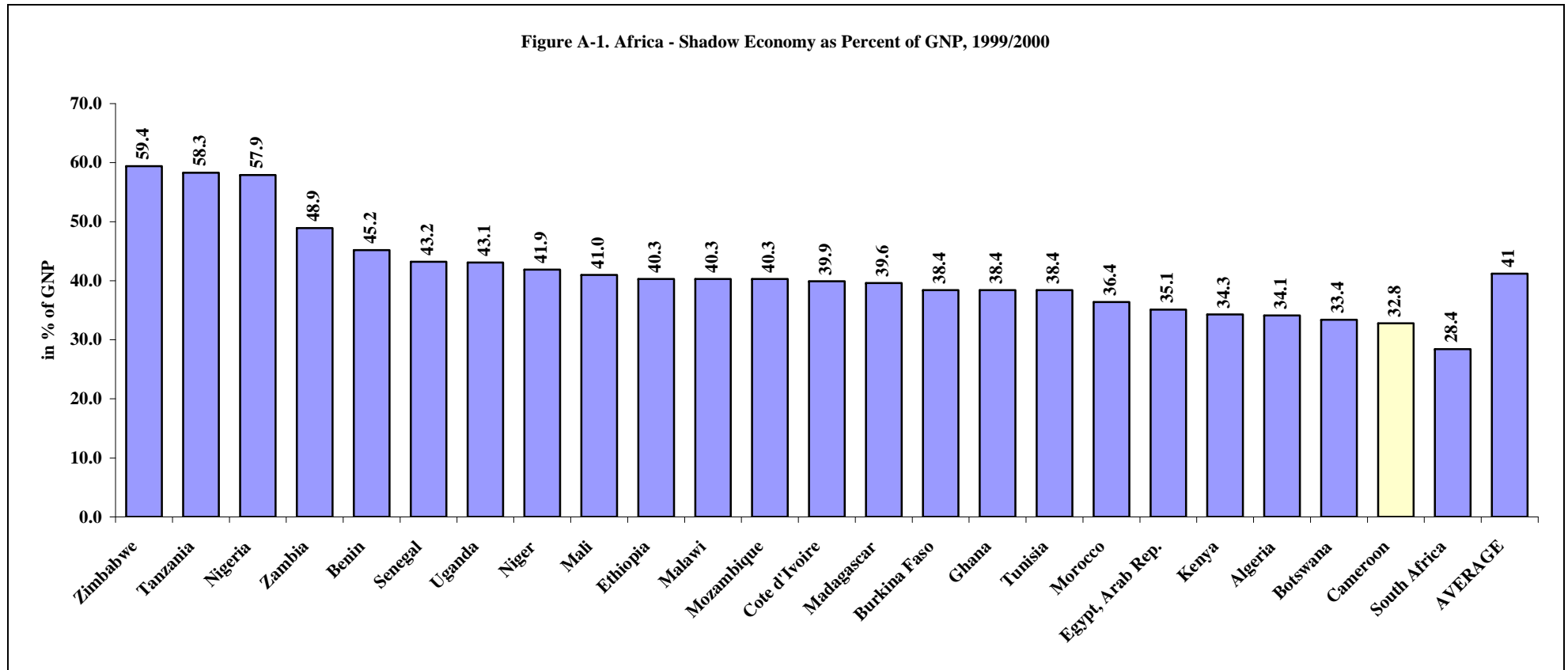
**Table A-10. Summary of Previous Conventional Studies of Tax Effort**

	Bahl (2003) OECD and less developed economies	Alm and Martinez-Vazquez (2003b) Developed and Developing countries	Teera (2002) Developed and Developing Countries	Piancastelli (2001) Developed and Developing Countries	Stotsky and WoldeMariam (1997) Sub-Saharan African countries	Tanzi (1992) Developing countries	Leuhold (1991) African countries	Bahl (1971) Developing countries	Shin (1969) Developed and Developing countries	Lotz and Morss (1967) Developed and Developing countries
<i>Dependent Variable</i>	Ratio of tax revenue to GDP	Ratio of total tax revenue to GDP	Tax to GDP ratio	Total Tax Revenues/GDP	Tax share in GDP	Tax share	Tax share	Taxable capacity	Tax Ratio	Ratio of tax revenue to GNP
Explanatory Variables	The non-agricultural share of GDP (positive, statistically significant)	Agriculture/GNP (negative, statistically not significant)  Mining/GNP (positive, statistically significant)	Ratio of agriculture to GDP (negative and positive depending on the estimation, strong negative impact for low income countries)  Ratio Manufacturing to GDP (negative, not statistically significant)	Agriculture GDP share (negative and positive, negative and statistically significant in a panel analysis)  Industry GDP share (positive, statistically significant in a time series analysis)  Service GDP share (positive, not always statistically significant)	The share of agriculture (negative, statistically significant)  The share of mining (negative, statistically significant)  Manufacturing share (positive, negative, not statistically significant)	The share of agriculture in GDP (negative, statistically significant)	The share of agriculture in income (negative, but not always statistically significant)  The share of mining in income (positive, negative, not statistically significant)	The agricultural share (negative, statistically significant)  The mining share (positive, statistically significant)	Per Capita GNP (positive, statistically significant only for the whole sample and the sub-samples high an low income countries )	Per capita GNP (positive, statistically significant for the entire sample and the low income countries, not significant for the high income countries)
	Openness ratio (the sum of the value of exports and imports as a share of GDP) (positive, statistically significant)	GNP per capita (negative, statistically significant)	GDP per capita (negative and positive, not always statistically significant)	GNP per capita (positive/negative tendency: positive, but not always statistically significant)	Per capita income (positive, statistically significant)	Per capita income (positive, but not statistically significant for some years)	The share of foreign trade (share of imports and exports in income) (positive, statistically significant)	Per capita income (positive, not statistically significant)	Foreign Trade Ratio (positive, not statistically significant)	Sum of exports and imports as a percentage of GNP (positive, statistically significant for the entire sample and the low-income countries, not significant for the high-income countries)

	The rate of population growth (positive, statistically significant)	Taxes on international trade/GNP (negative, not statistically significant)	Ratio of exports plus imports to GDP (negative and positive, not statistically significant, strong positive effect for lower middle income countries)	Trade/GDP (positive, statistically significant)	The share of imports in GDP (positive/negative, not statistically significant)  The share of exports in GDP (positive, statistically significant)	The share of imports in GDP (positive, statistically significant)	The share of foreign grants and loans in income (positive, statistically significant)	The export ratio (positive, but not always statistically significant)	The agricultural income ratio (negative, not statistically significant)	
	Simple correlation between tax effort and the size of shadow economy (negative, but not statistically significant)	Shadow economy / GDP (negative, statistically significant)	Shadow economy (positive, not always statistically significant, negative and statistically significant in one estimation for OECD countries)			Level of foreign debt in GDP (Positive, but not statistically significant in all estimations)			The rate of change in prices (positive, only statistically significant for the low income countries)	
			Further variables: Ratio of aid (tendency: negative impact) Ratio of expenditures to GDP (tendency: positive) Ratio of total expenditures (tendency: negative and positive)						The rate of rowth in population (negative, statistically significant for the whole sample and the low income countries)	

Source: Bird, Martinez-Vazquez, and Torgler (2006).

Figure A-1. Africa - Shadow Economy as Percent of GNP, 1999/2000



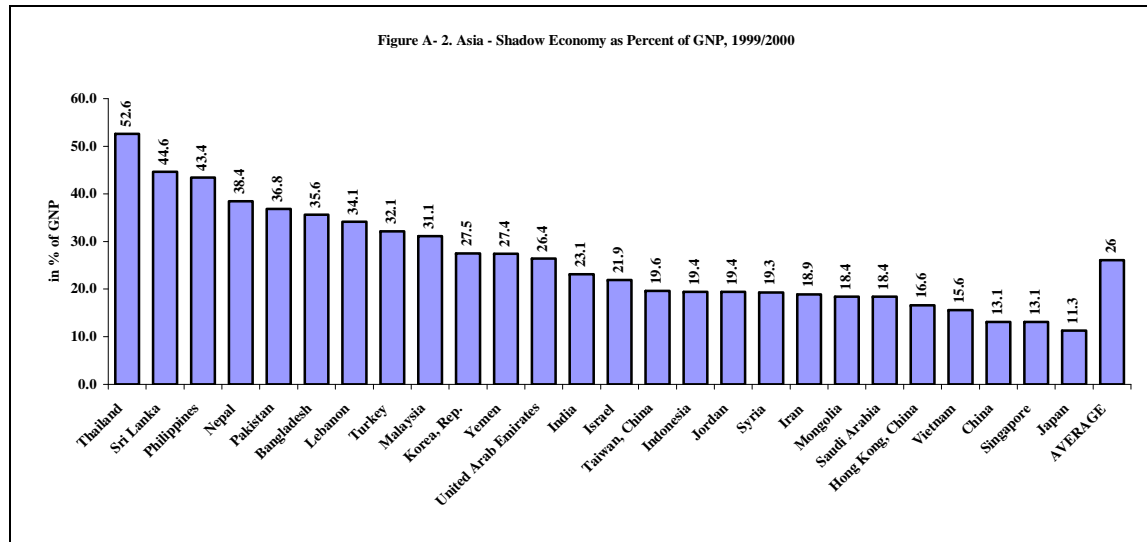


Figure A-3. Transition Countries - Shadow Economy as Percent of GNP, 1999/2000

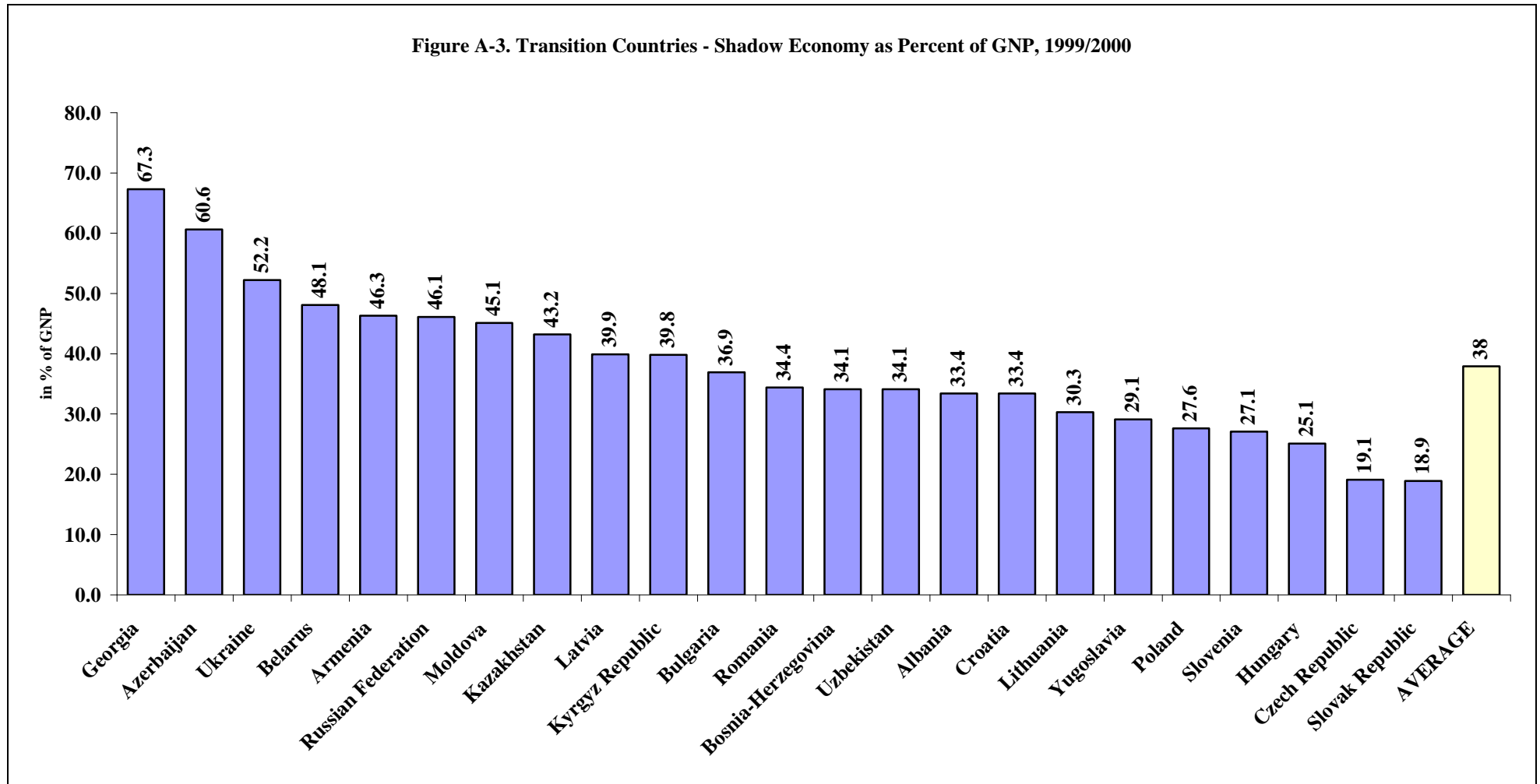


Figure A-4. OECD/West European Countries - Shadow Economy as Percent of GNP, 1999/2000

