EXPANDING TAXABLE CAPACITY AND REACHING REVENUE POTENTIAL: CROSS-COUNTRY ANALYSIS*

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INTRODUCTION

THE CONVENTIONAL ARGUMENT FOR RAISING tax revenues as an underpinning for economic and social improvement is being coupled with additional lessons emerging from recent aid-effectiveness dialogues. The idea is that attention to tax policy and administration is necessary if a country is to avoid the external aid dependency trap that undercuts accountable governance and, in turn, sustainable efforts toward poverty reduction.

The World Bank's (1997) report emphasized the essential role of government in allocating resources and highlights that taxation and expenditure are essential tools for macroeconomic stabilization, growth, and development. In the long run, countries must rely on an effective tax system to meet the needs of the public sector. However, most developing countries have not been able to raise sufficient revenues for essential public infrastructure and human development services (World Bank, 2005).

An effective tax system is fundamental for successful development. There is a large volume of theoretical and empirical literature on taxation that attests to the increasing attention that this topic has received from both academics and policymakers. The problems for developing countries to raise revenues are twofold. First, they typically have limited taxable capacity and a large share of economic activity in the informal sector.[1] Second, their tax regimes may be riddled with numerous tax relief initiatives and/or tax expenditures, which further deplete the tax base and tend to reduce the efficiency and effectiveness of tax collection efforts.

A first step in understanding revenue systems is to establish some commonly agreed upon performance measures and accompanying benchmarks. This is the motivation for and main focus of this paper. The paper particularly deals with the concept and empirical estimation of countries' taxable capacity and tax effort. The analysis and findings of the paper are intended to provide a starting point for tax policy discussion and design. The structure of the paper is as follows.

The second section highlights some critical problems in using the tax-GDP ratios to measure tax performance and extends the existing literature to the empirical estimation of a country's taxable capacity. The third section presents a comparison between a country's actual collection and its estimated taxable capacity to derive an index of tax effort. On the basis of their respective level of actual collection and tax effort, four distinct groups of countries are classified distilling some policy implications for revenue reforms. The fourth section concludes with a summary of the overall pattern and worldwide trends in tax performance and brief remarks on the challenges in designing an effective tax reform program.

EXPANDING TAXABLE CAPACITY AND REACHING REVENUE POTENTIAL: EMPIRICAL EVIDENCE AND POLICY IMPLICATIONS

The Concepts of Taxable Capacity and Tax Effort

The actual tax to GDP (or GNP) collection ratio is usually interpreted as a measure of tax effort and used as the basis for cross-country tax comparison. The use of such ratio is reasonable if one attempts to establish trends or to compare tax revenue performance across countries with similar economic structure and at the same level of income (Musgrave, 1987).[2] The advantage of using this approach is that it is simple and provides a quick overview of the trends of the worldwide tax collections.

However, when used to compare the effectiveness in revenue mobilization across countries in different income groups, the tax-GDP ratio could provide a "completely distorted" picture due to different

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economic structures, institutional arrangements, and demographic trends (Prest, 1979). In essence, this ratio does not reflect the tax capacity of a country and hence it is impossible to assess whether or not a country is out of line in comparison with its peers in its effort to raise domestic tax revenues.

A number of tax economists have attempted to deal with this problem by applying an empirical approach to estimate the determinants of tax collection and identify the impact of such variables on each country's taxable capacity.[3] *Taxable capacity* is the predicted tax-GDP ratio estimated from a regression, taking into account the country's specific characteristics. *Tax effort* is the index of the ratio between the share of the actual collection to GDP and the predicted taxable capacity. A tax effort of above 1 (high tax effort) implies that the country utilizes well its tax base to increase revenues (Stotsky et al., 1997). On the other hand, a country with the tax effort below 1 (low tax effort) is likely to have relatively substantial scope or potential to raise revenues.

The concepts of taxable capacity and tax effort can be extended to measure *(fiscal) revenue capacity* and *(fiscal) revenue effort*. Total fiscal revenue, by definition, consists of both tax and non-tax collection; it represents cash receipts from taxes, social contributions, and non-tax sources such as fines, fees, rent, and income from property or sales.

One should be cautious about the methodology used to estimate and interpret the tax effort index. The calculation of the index is sensitive to the predicted results of a country's taxable capacity. There exist certain caveats typical in empirical work such as systematic errors in measurement of independent variables. Other caveats, including the quality of the GDP measurement, are inherent in both tax effort indexes and tax-GDP ratios. More importantly, the measurement of the taxable capacity is based on, a priori, a set of explanatory variables that determine the potential capacity of a country to tax, but it does not reflect either the demand for higher public expenditures or the political willingness to tax (Bird, 1978;Toye, 1978). In addition, as the taxable capacity is estimated from a regression specification, inherently the tax effort index reflects the tax collection performance of a country in comparison with the average effort exercised by an average country in the selected sample. However, the "average" performance may not be directly relevant to the actual performance of a particular country; thus one may need to simply interpret the tax effort index as an indication for assessing the feasibility of raising additional revenues, given the tax mix policy and collection effort attained at the average level (Ahmad and Stern, 1989).

Due to multiple potential issues related to the methodology used to estimate and interpret tax effort indexes, Chelliah et al. (1975) emphasize that "the tax effort indexes are not intended to be applied in a mechanistic fashion but rather to be considered useful additional information in judging the scope for more taxes." (p.195) Tax effort cannot substitute for a comprehensive study of taxation in direct relation with the need for and composition of public expenditures of a particular country. This section provides an overall assessment of worldwide tax performance, using the concept of tax effort with due attention to its potential caveats. We conduct an empirical analysis to estimate a country's taxable capacity and tax effort over the period of 1994-2003 and the two sub-periods of 1994-99 and 2000-03.

Empirical Analysis of Taxable Capacity and Tax Effort: *The Model and Data*

In this study, we extend the empirical methodology applied by Tanzi and Davoodi (1997), and Bird, Martinez-Vazquez, and Torgler (2004) to cover a large sample of 104 countries for the 10-year period 1993-2004. To analyze the dynamics of taxable capacity and tax effort across countries between the 1990s and early 2000s, we also look at the two sub-periods: 1993-1999, and 2000-2004. Following Bird et al. (2004), we apply the empirical approach to both tax and total fiscal revenue efforts to test the robustness. The basic specification is:

$$Y_{it} = f(GDP_{it}, POP_{it}, TRADE_{it}, AGR_{it}, CORR_{it}, BUREAU_{it}),$$

where,

Y_{it}: Tax (including social contributions) or total fiscal revenue ratio to GDP.
GDP_{it}: GDP per capita (constant US$2000).
POP_{it}: Rate of population growth or age dependency ratio as a share of the total population.
$TRADE_{it}$: Trade openness (measured as ratio of exports plus imports of goods and services to GDP).
AGR_{it}: Agricultural value added.
$CORR_{it}$: Corruption index.
$BUREAU_{it}$: Bureaucracy quality.

The underlying hypothesis of the specification is that the tax or fiscal revenue capacity of a country is determined not only by economic factors but also by key demographic and institutional characteristics. In particular, high corruption, high population growth rates, and high age dependency ratios tend to depress the taxable capacity of a country, other things being equal.

There are two major sets of the independent variables tested. The first part consists of traditional supply side factors, including GDP per capita, population growth rate, international trade, and agricultural value added as a fraction of GDP. The data are mainly obtained from the World Bank's WDI (World Bank, 2006). The second part includes the proxies for the institutional setting of a country. To test the robustness of the institutional impact on a country's taxable income, two alternatives are used: the corruption index and the bureaucratic quality scores. The indexes are obtained from the Institutional Country Risk Guide (ICRG, 2006).

GDP per capita. GDP per capita is included in the regression as a proxy for the level of development of a country. In our analysis, GDP per capita is measured in constant US$2000. As a higher level of income typically correlates with a greater demand for public goods and services, and higher income increases the overall ability to pay in a society, one should expect higher tax payment and collection (Bahl, 1971; Fox and Gurley, 2005). By analyzing the recent worldwide trend and pattern of revenue collection, we also demonstrate that richer countries tend to collect more revenues, and similarly, countries tend to collect more revenues as they become more affluent. One would expect the sign of the coefficient on GDP per capita in the regression to be positive.

Population growth rate and age dependency ratio. To test the impact of demographic characteristics on a country's taxable income, we use two alternatives, specifically population growth rate and age dependency ratio. Bird et al. (2004) suggest that as the rate of population growth increases, the tax system may lag behind in its ability to capture new taxpayers. This problem is more pronounced when a country has weak tax administration capacity. Thus, the population growth rate is expected to be negatively related to the tax capacity. An alternative approach to measure the impact of the demographic feature on the taxable capacity is to use the age dependency ratio indicator. Consistent to the World Bank (2006) definition, this indicator is the ratio of the dependents – people younger than 15 or older than 64—to the working age population—those in the productive age between 15 and 64. It is expected that the higher the age dependency ratio, the lower the productive population and hence the narrower the tax base. Thus, we would predict that demographic characteristics, both population growth and age dependency ratio, are negatively correlated to the tax and fiscal revenue collections.

Trade openness. Trade openness is an aggregated level of export and import calculated as a fraction of GDP. Traditionally, trade taxes have been one of the key sources of revenue in the developing world. The sector is more formalized and it is relatively easy to tax. However, globalization and international competition have gradually led countries to reduce their reliance on trade taxes. The governments, especially those in middle- and high-income countries, are obligated to reduce tariffs at their borders over time. A growing concern in developing countries is how to strengthen the domestic revenue system to compensate for the expected losses in trade taxes. However collections from the borders remain high, especially in low-income countries in Africa. We expect to observe a positive relationship between trade openness and taxable capacity, but the strength of this correlation should be gradually decreased (Rodrik, 1998).

Agricultural value added. Agricultural value added is measured as a fraction of GDP. Value added is the net output of the agricultural sector after adding up all outputs and subtracting intermediate inputs. Agriculture is one typical hard-to-tax sector; most developing countries exempt from taxes a large share of agricultural activities due to its inherent difficulty to collect the tax or due to equity and political reasons. Thus a higher level of agricultural value added is expected to correlate with a lower level of taxable capacity. In addition, countries with a relatively larger share of agriculture in the economy generally have lower demand for public goods and services since most high-value public services are city-based (Tanzi, 1992).

Corruption index and bureaucratic quality. ICRG (2006) provides alternatives for gauging the quality of the institutional setting of a country, particularly the corruption index and bureaucratic quality. The ICRG staff collects political information and financial and economic data, converting these into points for each individual component on the basis of a consistent pattern of evaluation. The

political risk assessments are made on the basis of subjective analysis of the available information and the assessments are conducted on an annual basis. The corruption index measures the extent of corruption by assigning a numerical value to a country. The index ranges from 1 to 6, where a higher number means lower corruption.

The bureaucracy quality index is an alternative institutional indicator of governance. The index assesses political stability of a country and ranges from 1 to 4. The higher scores are given to countries where the bureaucracy has the better strength and expertise to govern without having to resort to drastic and frequent changes in policy or to interruptions in government services (ICRG, 2006). To make the comparison of the regression results based on the use of these two alternative indicators and to facilitate our presentation of the institutional impact on tax effort, we follow Tanzi and Davoodi (1997), by rescaling the original ICRG corruption index and bureaucracy quality indicator to a range of -6 (least corrupt or best bureaucratic quality) and -1 (most corrupt or worst bureaucratic quality). Our hypothesis is that lower bureaucratic quality is correlated with lower taxable capacity, other things being equal.

It is observed that all the intended independent variables, GDP per capita, population growth rate, age dependency ratio, trade openness, agriculture value added, corruption index and bureaucratic quality indicator, have the predicted sign of correlation with either tax or revenue-GDP ratios. In addition, all the correlations are sizable, ranging from 0.35 to more than 0.6 in absolute terms (results available upon request).[4]

Several considerations regarding the model specification should be mentioned. First, there are a number of institutional variables that have high correlation. For example, bureaucratic quality highly correlates with political stability and rule of law—leading to constraints in using a larger number of the institutional variables without the risk of multi-colinearity. Second, some of the institutional variables may be endogenous. For example, a conventional conjecture is that higher institutional quality may lead to higher taxes and revenues, and on the other hand, better tax and revenue performance may result in higher institutional quality. Bird et al. (2006) test the presence of an endogeneity problem, applying Two-Stage Least Squares (2SLS) approach and Hausman Chi-square test. The instrumental variables include ethnic fractionalization, language, and latitude. The Hausman Chi-square tests fail to detect the presence of simultaneity of the tax/revenue effort and institutional variables.

EMPIRICAL ESTIMATION OF TAX AND TOTAL FISCAL REVENUE CAPACITY

The empirical results are presented in Tables 1 and 2 for taxable capacity and for fiscal revenue capacity, respectively.[5] Each table has two panels: Panel A presents results of the specifications using population growth as proxy for the demographic influence on taxable capacity, and Panel B replaces population growth with age-dependency ratios. The regressions capture the entire period of 1994-2003 and the two subperiods of 1994-1998 and 1999-2003 to test the dynamics of tax and fiscal revenue capacity. In each table, equation 1 (the first column of the estimated coefficients) represents the regression on traditional tax handles. Equations 2 and 3 show results when institutional elements (corruption index and bureaucratic quality indicator) are respectively added on the right hand side.

In Table 1, coefficients on the entire set of independent variables generally have predicted signs and are statistically significant. The exception is the coefficients on GDP per capita in equations 1-3 (Panel A) and equations 2-3 (Panel B) for the period 1994-98, which are not statistically significant or have unpredicted sign (equation 3, Panel A). Table 2, Panel A, shows similar results: the coefficients on GDP per capita are insignificant for equations 1-3 for the sub-period 1994-98 and unpredicted sign in equations 2-3. In Table 2, Panel B, the coefficients on GDP per capita are, again, insignificant for the period 1994-98 but have predicted sign. It is worth noting that while the coefficients on population growth are statistically significant and have predicted signs in all equations, the coefficients on age dependency ratio are generally insignificant, except for equations 2 and 3 for the 1999-2003, and have an unpredicted sign for equation 1 (period 1994-2003) and equations 1-3 (sub-period 1994-98).

In general, the results support the previous studies on the determinants of taxable and revenue capacity and particularly the recent empirical work by Bird (2007), and Tanzi and Davoodi (1997).[6] A country with higher income level, lower population growth rate, more trade openness, lower agriculture share in GDP, and higher institutional

Table 1
Determinants of Taxable Capacity
Panel A (population growth used as proxy for demographic characteristic)

Tax/GDP	*1994-2003*			*1994-1998*			*1999-2003*		
	(Eq. 1)	(Eq. 2)	(Eq. 3)	(Eq. 1)	(Eq. 2)	(Eq. 3)	(Eq. 1)	(Eq. 2)	(Eq. 3)
GDP per capita[1]	2.273	2.171	2.051	0.094	0.146	-0.233	3.493	2.730	2.647
	(8.06)**	(5.46)**	(5.15)**	(1.26)	(0.16)	(0.25)	(8.08)**	(4.79)**	(5.00)**
Population Growth	-2.157	-2.662	-2.560	-2.525	-2.647	-2.753	-2.37	-2.903	-2.767
	(8.60)**	(10.64)**	(10.63)**	(7.28)**	(5.50)**	(5.75)**	(6.40)**	(7.29)**	(7.50)**
Trade Openness	0.059	0.046	0.046	0.062	0.040	0.038	0.048	0.039	0.040
	(9.11)**	(7.78)**	(7.70)**	(5.23)**	(3.74)**	(3.64)**	(5.43)**	(4.63)**	(4.58)**
Agriculture Value Added	-0.185	-0.129	-0.118	-0.196	-0.155	-0.154	-0.212	-0.141	-0.120
	(9.18)**	(5.79)**	(5.28)**	(6.75)**	(4.30)**	(4.34)**	(6.42)**	(3.93)**	(3.37)**
Corruption		-0.612			-0.693			-0.694	
		(4.04)**			(2.61)**			(2.81)**	
Bureaucracy			-0.560			-0.638			-0.666
			(4.59)**			(2.87)**			(3.60)**
Constant	19.559	17.321	17.093	21.053	18.185	19.015	20.341	17.913	16.976
	(22.65)**	(15.84)**	(15.71)**	(12.96)**	(7.72)**	(9.25)**	(16.82)**	(11.38)**	(10.58)**
Observations	884	724	724	329	252	252	380	333	333
R-squared	0.49	0.52	0.52	0.42	0.39	0.40	0.56	0.58	0.58

Panel B (Age dependency ratio used as proxy for demographic characteristic)

Tax/GDP	*1994-2003*			*1994-1998*			*1999-2003*		
	(Eq. 1)	(Eq. 2)	(Eq. 3)	(Eq. 1)	(Eq. 2)	(Eq. 3)	(Eq. 1)	(Eq. 2)	(Eq. 3)
GDP per capita[1]	3.037	2.731	2.614	1.621	1.343	1.402	3.535	2.680	2.620
	(8.39)**	(6.46)**	(6.14)**	(1.97)*	(1.37)	(1.50)	(7.57)**	(4.40)**	(4.33)**
Age Dependency Ratio	-5.337	-8.593	-7.315	-6.859	-6.114	-5.815	-6.301	-12.680	-10.175
	(2.75)**	(4.34)**	(3.80)**	(2.11)*	(1.84)	(1.71)	(2.05)*	(3.84)**	(3.24)**
Trade Openness	0.058	0.044	0.045	0.059	0.028	0.028	0.049	0.042	0.044
	(7.80)**	(6.21)**	(6.22)**	(4.17)**	(2.30)*	(2.23)*	(4.84)**	(4.15)**	(4.12)**
Agriculture Value Added	-0.184	-0.134	-0.133	-0.163	-0.127	-0.134	-0.236	-0.142	-0.139
	(7.60)**	(4.90)**	(4.91)**	(4.85)**	(3.16)**	(3.20)**	(5.79)**	(3.19)**	(3.23)**
Corruption		-0.451			-0.647			-0.693	
		(2.76)**			(2.18)*			(2.64)**	
Bureaucracy			-0.445			-0.429			-0.661
			(3.37)**			(1.93)			(2.95)**
Constant	20.055	19.967	18.963	21.310	18.109	19.341	21.808	22.291	20.158
	(13.15)**	(12.84)**	(11.35)**	(7.24)**	(5.51)**	(6.13)**	(10.14)**	(9.22)**	(7.49)**
Observations	868	724	724	323	252	252	374	333	333
R-squared	0.41	0.44	0.44	0.30	0.29	0.28	0.50	0.52	0.52

[1]GDP per capita*10,000

Notes: The dependent variable is Taxable capacity. Estimation technique is OLS.

Robust *t* statistics in brackets.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 2
Determinants of Fiscal Revenue Capacity
Panel A (population growth used as proxy for demographic characteristic)

Revenue/GDP	*1994-2003*			*1994-1998*			*1999-2003*		
	(Eq. 1)	(Eq. 2)	(Eq. 3)	(Eq. 1)	(Eq. 2)	(Eq. 3)	(Eq. 1)	(Eq. 2)	(Eq. 3)
GDP per capita[1]	2.157	1.555	1.624	0.359	-0.510	-0.984	2.966	2.251	2.666
	(5.39)**	(3.36)**	(3.48)**	(0.45)	(0.55)	(1.01)	(6.00)**	(3.47)**	(4.33)**
Population Growth	-1.246	-1.605	-1.504	-1.508	-1.590	-1.691	-1.635	-2.133	-2.054
	(5.64)**	(6.65)**	(6.36)**	(4.41)**	(3.16)**	(3.28)**	(4.41)**	(5.60)**	(5.60)**
Trade Openness	0.070	0.057	0.057	0.077	0.051	0.050	0.054	0.046	0.047
	(10.02)**	(9.26)**	(9.08)**	(5.83)**	(4.52)**	(4.41)**	(5.69)**	(5.12)**	(4.96)**
Agriculture Value Added	-0.285	-0.268	-0.264	-0.289	-0.298	-0.294	-0.309	-0.264	-0.266
	(13.18)**	(11.97)**	(11.37)**	(8.72)**	(7.33)**	(7.28)**	(9.51)**	(8.26)**	(8.12)**
Corruption		-0.545			-0.545			-0.603	
		(3.29)**			(1.90)			(2.25)*	
Bureaucracy			-0.392			-0.587			-0.260
			(3.27)**			(2.79)**			(1.41)
Constant	23.278	21.704	22.079	24.332	23.236	23.501	24.337	22.434	23.449
	(24.92)**	(18.93)**	(20.50)**	(13.82)**	(9.06)**	(11.27)**	(19.05)**	(13.62)**	(15.30)**
Observations	886	725	725	330	252	252	381	334	334
R-squared	0.47	0.50	0.50	0.41	0.39	0.39	0.54	0.57	0.57

Panel B (Age dependency ratio used as proxy for demographic characteristic)

Revenue/GDP	*1994-2003*			*1994-1998*			*1999-2003*		
	(Eq. 1)	(Eq. 2)	(Eq. 3)	(Eq. 1)	(Eq. 2)	(Eq. 3)	(Eq. 1)	(Eq. 2)	(Eq. 3)
GDP per capita[1]	2.488	2.094	1.970	1.098	0.559	0.233	2.984	2.286	2.523
	(6.14)**	(4.37)**	(4.17)**	(1.31)	(0.57)	(0.25)	(5.92)**	(3.37)**	(3.82)**
Age Dependency Ratio	1.488	-1.200	-0.224	0.830	0.407	0.725	-2.061	-7.569	-6.309
	(0.75)	(0.57)	(0.11)	(0.24)	(0.11)	(0.19)	(0.77)	(2.70)**	(2.25)*
Trade Openness	0.066	0.055	0.055	0.071	0.042	0.041	0.051	0.047	0.048
	(9.01)**	(8.13)**	(8.11)**	(5.13)**	(3.66)**	(3.54)**	(5.09)**	(4.70)**	(4.62)**
Agriculture Value Added	-0.315	-0.310	-0.308	-0.290	-0.309	-0.307	-0.345	-0.289	-0.294
	(12.68)**	(10.36)**	(10.39)**	(7.92)**	(6.22)**	(6.08)**	(10.25)**	(7.65)**	(7.84)**
Corruption		-0.336			-0.454			-0.490	
		(1.95)			(1.50)			(1.79)	
Bureaucracy			-0.357			-0.494			-0.283
			(2.95)**			(2.56)*			(1.35)
Constant	21.214	21.874	20.963	21.525	21.217	21.062	24.658	25.693	25.489
	(13.72)**	(14.94)**	(13.52)**	(7.13)**	(6.71)**	(6.93)**	(12.23)**	(11.94)**	(10.58)**
Observations	871	726	726	324	252	252	375	334	334
R-squared	0.44	0.48	0.48	0.36	0.36	0.36	0.52	0.54	0.54

[1]GDP per capita*10,000

Notes:The dependent variable is Taxable capacity. Estimation technique is OLS.

Robust *t* statistics in brackets.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

quality is likely to have higher tax and revenue capacity. It is interesting to observe that in addition to the traditional tax collection determinants, corruption has highly statistically significant and sizable impact on both taxable and revenue capacity. Particularly, the results in equation 2 (Tables 1 and 2) indicate that, (controlling for the level of income, demographic characteristics, trade openness, and agriculture) an increase in corruption by one-standard deviation (2.2) reduces the mean tax and revenue collection as a share of GDP by approximately 1.4 and 1.2 percentage points, or by 6.7 and 4.9 percent, respectively.

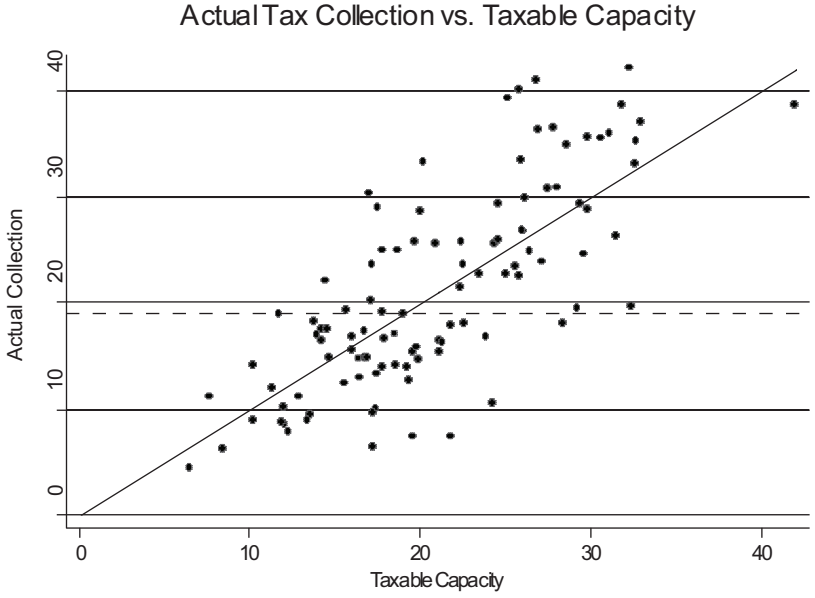
ESTIMATION OF TAX EFFORT INDEXES AND POLICY IMPLICATIONS

To capture the direct impact of corruption, we select equation 2 (in Tables 1 and 2, Panel A) for the estimation of the tax capacity and total fiscal revenue capacity. (Note corruption index is used as proxy for institutional quality, but bureaucratic quality is excluded from equation 2.) The index of tax effort is calculated by dividing the actual tax-GDP ratio by the taxable capacity, and the results are shown in Annexes 5-6. In general, countries' tax efforts are relatively stable over the two sub-periods 1994-98 and 1999-2003, except for some countries, specifically, Costa Rica, Denmark, Germany, Iceland, Moldova, Nicaragua, and Vietnam. Interestingly, all the three developed countries in the sample (Denmark, Germany, and Iceland) have lowered their tax efforts in the second sub-period.

Similar to the findings in Chelliah et al. (1975), and Stosky and WoldeMariam (1997), the predicted tax efforts are positively correlated with the actual collection: higher collection tends to be associated with higher tax effort. The correlation between the two is estimated to be greater than 0.65 for the period of 1994-2003. A possible conjecture is that countries with higher collection tend to exhibit their above-average tax effort (Chelliah et al., 1975). This implies that tax effort and actual tax-GDP ratios can be used as compliments in measuring tax performance across countries. However, one should also observe a number of exceptions, notably Uganda and Ethiopia with low collection but high effort, and Estonia, Latvia, Ireland, and Switzerland with high collection and low effort.

Figure 1 depicts the relationship between actual collection and the predicted taxable capacity during 1994-2003. The 45-degree line represents countries

Figure 1: **Actual Tax Collection vs. Taxable Capacity (1994-2003)**



with the unitary tax effort, along which tax collection exactly equals the predicted taxable capacity. Countries located above the line are those with tax efforts greater than 1 (high tax efforts), and below the line are those with tax efforts less than 1 (low tax efforts). Let's use 1 as the benchmark for tax effort and 19 percent (the median of the tax-GDP ratios in the country sample) for actual tax collection. A country is regarded as a low-collection country if its actual collection is lower than the median of 19 percent, and regarded as a high-collection country if its collection is above the median threshold. The use of tax effort and actual tax collection benchmarks allows us to rank countries into four different groups: (1) low tax collection, low tax effort; (2) high tax collection, high tax effort; (3) low tax collection, high tax effort; and, (4) high tax collection, low tax effort. Consistent to our observation that tax effort is positively correlated with actual collection, the majority of countries clusters in the first two groups (low tax collection and low tax effort; or high tax collection and high tax effort). Table 3 provides a list of the countries in the four different groups.

We argue that while taxation is always a critical dimension of fiscal policy for all countries, countries at various stages of development and with different initial levels of tax collection and effort should rely on different strategies for tax reforms. Our analysis focuses on tax performance and broad directions for reforms in developing countries. A caution should be emphasized again in interpreting our broad country classification by tax effort and tax collection and subsequent comments. They serve as complimentary but not substituting for detailed analysis of a country's specific fiscal policies and its path on taxation reforms. The later is essentially based on comparison with the sample's average performer, which may not necessarily be relevant to the specific country under consideration. Different countries may have different sets of fiscal preferences regarding relative size of government and pressing needs to rely on taxation to finance public expenditures.

Group 1: Low Collection and Low Effort

Countries listed in this group share some critical similarities. Except for the two high-income countries (Korea and the United States), all others are from the developing world, of which three-fourths are ranked as low-income or lower-middle-income countries. Some of the countries (for example, Cameroon and Madagascar) are heavily aid dependent. The majority of the developing countries in this group have numerous problems in both tax policy and tax administration. Some countries (e.g., Cameroon, Madagascar, the Philippines, and India) have their tax policies riddled with overly complex structures and multiple—largely ad-hoc—incentives that narrow the already limited tax base, create more loopholes for tax avoidance and evasion, intensify the public perception of unfairness of taxes, and generate opportunity for corruption. In response to the challenge of increasing capital mobility and deepening globalization, some countries (e.g., India and Cameroon) choose to retain generous tax incentives to compensate for their relatively high statutory rates on corporate income. Such complex tax regimes combined with the existing weak revenue administration capacity have led to chronic low tax collection at high administrative and compliance costs. Given this existing tax system, an improvement in tax collection would require that these low and lower-middle-income countries undertake comprehensive reforms of both tax policy and tax administration. Revenue enhancement should be one of the key objectives, as long as it is compatible with efficiency and equity criteria. They particularly need to broaden the base, rationalize the rate structure and incentive schemes, and remove tax-induced economic distortions with focus on enhancing revenue productivity of major taxes, particularly the broad-based consumption VAT.

Group 2: High Collection and High Effort

Included in this group typically are middle- and high-income countries. For these countries, there appears to be relatively little scope for further enhancing revenue collection without generating disproportionately high economic costs.

It is worth noting that the initial condition of high collection and high tax effort in a number of developing countries does not necessarily mean their tax structures or administrations could be regarded as conforming to international best practices. In reality tax regimes in many countries remain highly complex and inefficient. For example, in Brazil, the complexity of the coexistence of both federal VAT (IPI) and state VAT (ICMS) is further aggravated by a multiple rate structure (with 24 positive rates effective at the current stage), numerous exemptions and special VAT regimes, which

Table 3

List of Countries according to Tax Efforts and Tax Collections Level

		TAX EFFORT						
		LOW				*HIGH*		
TAX COLLECTION		*Developing Countries*			*Developed Countries*	*Developing Countries*		*Developed Countries*	
	LOW	Albania	Dominican Republic	Nicaragua	Korea, Rep	Bolivia			
		Argentina	Ecuador	Oman	United States	Cote D'Ivoire			
		Armenia	El Salvador	Panama		Ethiopia			
		Azerbaijan	Guatemala	Paraguay		Ghana			
		Bahrain	India	Peru		Kenya			
		Bangladesh	Indonesia	Philippines		Pakistan			
		Botswana	Iran	Sierra Leone		Senegal			
		Cameroon	Kazakhstan	Sri Lanka		Syria			
		Chile	Lebanon	Sudan		Turkey			
		China	Madagascar	Thailand		Uganda			
		Colombia	Malaysia	Venezuela		Vietnam			
		Congo, DR	Mexico	Yemen		Zambia			
		Congo, Rep				Bolivia			
		Developing Countries			*Developed Countries*	*Developing Countries*		*Developed Countries*	
	HIGH	Estonia			Australia	Algeria	Namibia	Austria	Norway
		Latvia			Canada	Belarus	PNG	Belgium	Portugal
		Lithuania			Germany	Brazil	Poland	Cyprus	Slovenia
		Moldova			Ireland	Bulgaria	Russian Fed	Denmark	Spain
		Romania			Luxembourg	Croatia	Slovak Rep	Finland	Sweden
		Trinidad &Tobago			Switzerland	Czech Rep	South Africa	France	UK
		Ukraine				Egypt	Tunisia	Greece	
						Hungary	Uruguay	Italy	
						Jamaica	Yugoslavia	Morocco	
						Jordan	Zimbabwe	Netherlands	
						Mongolia		New Zealand	

have triggered pervasive interstate competition. In all of these countries, widespread deductions, exemptions, and other incentives are also granted in major direct income taxes (PIT, CIT).

Revenue enhancement should not be the key objective of tax reforms in these countries with already high level of collection and high tax effort. Instead, revenue neutrality or even lower overall tax burden in some countries with excessively high tax rates may be strategically sought. Reform activities should primarily aim to enhance the economic efficiency of existing taxes, reduce tax-induced distortions and improve the business climate through further rationalizing the tax regimes, rebalancing the tax mix, and simplifying the administration procedures.

Group 3: Low Collection and High Effort

Listed in this group are only a small number of countries, the majority of which (approximately 80 percent) are still at their early stage of development.[7] In the low-income countries, administration capacity is notably low and the tax regime is highly unstable. They have low collections, whereas high tax efforts are usually achieved by either enforcing easy taxes (particular trade taxes) or imposing high taxes on the formal sector, or both. Uganda is the case in point. The country's tax system represents a combination of multiple contrasts: relatively high tax effort, low collection, and taxation being considered as a significant impediment to investment and formality (Chen et al., 2001). Revenue collection has stagnated at about 12 percent since the early 2000s. The recent tax policy reform strategies have been largely inconsistent: an increase of statutory rates in some major taxes was blended with introduction of new exemptions and zero rates in the VAT. In addition, Uganda, being a land-locked country, still relies heavily on distorting trade taxes; and a high tax burden is being imposed on a limited number of taxpayers, and medium-sized firms that already bear disproportionately high share of taxes (Gauthier and Reinikka, 2006). Short-term tax reform measures should aim at streamlining tax policy and tax administration procedures to reduce compliance costs and encourage formality, and to lower tax barriers to firms' entry and operations. Medium- to long-term reform priorities are to expand the scope for raising revenue by broadening the effective tax base and enhancing the functioning of the tax administration.

Group 4: High Collection, Low Effort

Of the total 13 countries listed in this group, about 77 percent are from the rank of upper-middle-income and above. Six are developed countries, and four—upper-middle-income countries. Of the ECA countries, Estonia, Latvia, and Lithuania are part of the EU-8, and Romania just joined the EU at the beginning of 2007. Ukraine, with a robust increase in revenue collection in 2005 to 35 percent, has apparently shifted to the group of countries with high collection, high effort (Group 2). These countries demonstrate that they have high revenue potential and that their existing high level of tax collection but low effort may reflect their choice of the level of taxation.

A close look at the experience of the ECA countries in this group reveals that with the already high level of collection, they need to consider restructuring their tax mix, particularly reducing the excessive burden on production factors and shifting toward taxation of broad-based consumption sources. These countries typically impose high factor income taxes, specifically taxes on labor. The tax wedge on labor, defined as the ratio of the total taxes (income taxes and Social Security contributions) over wages plus employer's Social Security contributions, in EU-8 and Romania is on average greater than 45 percent, which is probably the highest in the world (for comparison, the average rate in OECD countries is around 40 percent; Rutkowski and Scarpetta, 2005).

CONCLUSION

Finding a composite index for measuring and benchmarking performance in taxation is both theoretically and practically challenging. The use of a tax effort index which relates the actual tax collection of a country to its estimated taxable capacity is tempting because it takes into account the country's specific fiscal, demographic, and institutional characteristics as compared to its peers and hence provides a fuller picture of the country's tax performance in comparative terms. However due to certain potential caveats in the modeling of taxable capacity and in the measurement of the actual tax-GDP ratio itself, the results need to be interpreted with care and be complimentary to but not substituting detailed analysis of a country's tax system. Such analysis should cover the contexts of the country's overall fiscal policy, and particularly

the demand for and composition of public expenditures at a particular stage of development.

The paper lends support to the suggestions in the available literature that developing countries have limitations to expand the scope for taxation, efficiently and equitably, which is in turn dependent on the underlying taxable capacity and the country's initial level of tax collection. While taxation is the best reliable alternative to finance public spending in the long run, developing countries generally experience a chronic gap between the level of revenues and the desirable level of public funds. The structural issues related to taxation indicate that all countries have to adopt a long term vision for taxation reforms, and specific strategies for reforms cannot be "one size fits all." For example, countries with low level of actual collection and low tax effort may have ample scope for raising revenues to reach their potential without aggravating economic distortions within the medium term. In contrast, a few low-income countries, trapped in the situation of relatively low collection and high tax effort, have limited short-term scope to enhance revenue without inducing high collection (both compliance and administration) costs and creating negative incentives for the formal sector.

Finally, in addition to structural factors, the politics of taxation is critically important in revenue reforms in all countries at vastly different levels of development. As Lora and Olivera (2006) emphasize, taxation is highly path-dependent due to resistance of the elites; and in addition, the wide-reaching effects of taxation as well as the common pool nature of tax revenues make it difficult to reach the cooperative solutions on establishing simple, efficient, and equitable tax systems. It is politically, and hence practically challenging, to make fundamental changes to an established tax structure. Hence, the success of any tax revenue reform is highly dependent, inter alia, on the top political commitments. The discussion on revenue reforms must be country specific and reliant on comprehensive analysis of the country's revenue potential, revenue performance, and political readiness to difficult reform measures.

Notes

[1] The growing consensus among tax economists is that a higher share is a good argument in favor of the introduction of a value added tax (VAT) for both revenue and equity purposes; some consumption in the informal economy cannot completely evade the tax as part of it is eventually picked up by the VAT (see, for example, Bird and Gendron, 2007).

[2] In the early 1970s, international tax advisors used the ratio of 18 percent, postulated by W.A. Lewis, as an arbitrary benchmark for a desirable minimum level of tax collection (Musgrave and Musgrave, 1974).

[3] See, for example Lotz and Morss (1967); Bahl (1971); Chelliah et al. (1975); Tait et al. (1979), Tanzi (1992); Stotsky and WoldeMariam (1997); Bird et al. (2004).

[4] To ensure consistency, all data on tax-GDP and fiscal revenue-GDP ratios are taken from the same sources (World Bank, 2006). It is worth noting that subnational revenue data from either WDI or IMF Government Finance Statistics are largely missing, and due to the limitation of the statistics, the analysis covers only the tax and revenue collection at the central level. The data tend to under record the tax level in countries with significant collection at the subnational levels, which Bird et al. (2004) has also cautioned about. After checking outliers, we have excluded Kuwait and United Arab Emirates from the sample as these oil abundant countries appear to rely mostly on royalties and fees from natural resources.

[5] As previously defined, taxable capacity refers to the predicted tax-GDP ratio on the basis of a regression accounting for a country's specific tax handles and quality of institutional setting, and the similar concept of (fiscal) revenue capacity refers to the predicted revenue-GDP ratio.

[6] For an excellent review of the empirical results of other major studies on taxable capacity, see Bird and Gendron (2007).

[7] The tax-GDP ratio was about 20 percent in Kenya in 2005, while it was approximately 24 percent in Turkey in 2006. With the recent surge in tax collection in these two countries, both Kenya and Turkey appear to have shifted to the group of countries with high collection and high effort (Group 2).

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