



**TAX EFFORT AND TAX POTENTIAL OF  
STATE GOVERNMENTS IN MEXICO:  
A REPRESENTATIVE TAX SYSTEM**

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## **ABSTRACT**

Over the last two decades, Mexico has modified its intergovernmental fiscal structure from a very centralized system to a distorted scenario where state governments have gained substantial expenditure functions and most of the taxation responsibilities have remained in the federal government. It is argued that to move towards a more fiscally responsible scenario, some decentralization on the taxation side is needed. In this context, by constructing a representative tax system (RTS), this paper evaluates tax effort and tax potential in Mexico. The results are a useful input for policy decision making, not only in the event of future tax decentralization attempts but also in designing a new transfer scheme. The results are also the first RTS constructed for the Mexican case, and show that regional data in Mexico is gradually improving. Also, while the results shed some light as to which taxes could potentially be decentralized, the article warns about the fact that regional disparities in the country may well be a limitation on the extent to which taxes can be decentralized.

## **RESUMEN**

Durante las últimas dos décadas México ha transformado su estructura fiscal intergubernamental, pasando de un sistema muy centralizado a un escenario distorsionado en el que los gobiernos estatales han adquirido importantes funciones de gasto y la mayoría de las responsabilidades de imposición permanecieron en el gobierno federal. Se sostiene que para moverse hacia un escenario fiscalmente más responsable se necesita alguna descentralización del lado de la imposición. En este contexto, este trabajo evalúa, a través de la construcción de un sistema impositivo representativo (SIR), el esfuerzo impositivo y el potencial impositivo en México. Los resultados son un insumo útil para la decisión de políticas, no sólo para posibles intentos futuros de descentralización de la imposición sino también para diseñar un nuevo esquema de transferencias. Los resultados constituyen también el primer SIR construido para el caso mexicano y muestran que en México los datos regionales están mejorando gradualmente. Asimismo, si bien los resultados arrojan alguna luz acerca de cuáles impuestos podrían descentralizarse, el artículo advierte que las disparidades regionales en el país pueden bien pueden limitar la medida en que los impuestos puedan descentralizarse.

## 1. INTRODUCTION

Formally, Mexico has traditionally been a federation. In practice, however, for several decades in its recent economic and political history, the country was organized in a very centralized manner. For most of the decades that followed the Mexican Revolution (1910–1917), the federal government played a leading role in pursuing national development policies.

In this regard, the fiscal arena was not an exception. During the second half of the twentieth century, the federal government gradually came to play an important role, originally by strengthening the tax authority of an originally fragmented and weak market, and later by practically monopolizing not only public spending but also the collection of the major sources of tax revenues. This process reached its peak in 1980, when extra public revenues from the oil boom allowed the federal government to carry out a major fiscal reform, which among other things, introduced the value-added tax (VAT) and simplified the whole tax system. As a result of these changes, state governments transferred practically all their major tax responsibilities to the federal government. In exchange for this, the federal government designed a transfer system that more than compensated states for the losses implied by the changes. These arrangements constitute the basis of what became known as the National System of Fiscal Coordination (SNCF), which is still the legal framework whereby tax coordination between the federal and state governments occurs.

On the expenditure side, during the 1980s the system was also heavily concentrated at the federal level and, even more importantly, the territorial allocation of federal resources was not subject to any explicit criteria other than the general guidelines set out every year in the National Development Plans. In practice, this meant that there was a lot of room for discretionary decisions. Indeed, the decade can be characterized as a period that lacked fiscal accountability.

During the nineties, as political democratization increased, important decentralization processes were initiated in areas like education, health, and social expenditures. While these processes have not been free of obstacles and difficulties, the

resources that were decentralized are now subject to formulas and/or criteria known to every one.<sup>1</sup> That is, compared to the previous decades, the fiscal system is now far more transparent.

These processes of decentralization have occurred only on the expenditure side. On the revenue side, despite the fact that the formula for distributing resources has been modified several times, the concentration of tax capacity continues to be on the federal government. Mexico thus has a very distorted scenario, where state governments have gained substantial expenditure powers and their tax generation capacity is very limited.

In theory it is always possible for a central government to collect taxes and by means of an appropriate transfer system, distribute resources to sub-national governments. Gordon (1993) shows that under certain (restrictive) conditions, it is possible to design a transfer system that reproduces a fully decentralized regime.

However there are important reasons why a system of intergovernmental fiscal relations with the characteristics of the Mexican system would move further towards a more decentralized tax regime, however limited this decentralization might be. First, theoretical work suggests that when a transfer system is “too large” this is often at the expense of financial self-discipline on the part of sub-national governments (McKinnon and Nechyba 1997). As suggested by Wildasin (1998), “problems of fiscal discipline may result not because there is too much fiscal decentralization, but because there is too little.” In this line of thought, some international experiences are illustrative (see Jones et al. 2000 and Dixit and Londregan 1998). Second, there is a consensus in the economic literature that to avoid economic distortions, lower levels of government should not tax mobile economic units. However, literature on inter-jurisdictional competition suggests that on efficiency grounds, mobile economic units should be taxed by lower levels of government, whenever they benefit from the public services provided in the region. As Oates and Schwab (1988) put it, “If local governments provide local inputs that increase the productivity of capital employed in their jurisdictions, then they should levy benefit taxes on capital in order to provide the set of signals needed for the efficient deployment of capital across localities.” And finally, as suggested by Sempere and Sobarzo (1998), the excessive centralization in Mexico over the previous decades was clearly not beneficial insofar as accountability and, more generally, fiscal responsibility is

concerned. More decentralization does not necessarily mean more accountability, unless it is accompanied by partial decentralization of tax responsibilities.

From the Latin American comparative perspective it is important to mention that despite this distorted scenario between revenues and expenditures, and unlike experiences in Argentina and Brazil, state governments in Mexico have had a relatively limited borrowing capacity, which helps us to understand the relatively more disciplined financial situation at the sub-national level.<sup>2</sup>

The purpose of this paper is to evaluate state tax effort and state tax potential in Mexico. To do so, a Representative Tax System (RTS) for Mexico has been constructed, analyzing not only the state tax effort of the operating state taxes but, more importantly, state tax potential. This was done for taxes that the federal government levies now but could potentially transfer, even if partially, to state governments. The results are a useful input for public policy decision making because they shed light on to how to delineate a tax decentralization strategy, and because even in the event of a more limited reform modifying the present transfer formula, indicators of tax performance are necessary.

It is important to mention that this article presents an original contribution. Ours are the first estimates of this kind in Mexico. This is explained in part by the lack of information on the territorial origin of the main taxes imposed by the federal government (income taxes and VAT) and in part too by the lack of regional statistical information in Mexico. Fortunately, over the last few years, regional statistics have improved not only in terms of quality but also in terms of quantity. Also, RTSs have often been constructed for other countries and the methodology is certainly not new. However, RTSs are normally heavy regional-data-demanding systems and it is perhaps this last point that explains why the RTS presented here is the first effort of this nature in Mexico. The reader should note that the RTS presented is not a particular proposal for tax decentralization or a proposal in favor of a particular tax for decentralization. The results presented here intend only to provide input information. The decision about which taxes should be decentralized and to what degree goes beyond the purpose of this document.

Finally, while this document tries to provide useful estimations for future reforms based only on economic efficiency criteria, whether or not Mexico will move in this particular direction and if so, how far, very much depends on additional factors. For

instance, we do not address the issue of how far a tax decentralization process can go in a country like Mexico, where tax decentralization is needed for improving fiscal responsibility and, at the same time, a strong federal government is needed for income redistribution purposes (mainly in the form of assistance to the poor). Another point that is not addressed here but is essential to understand the possibilities of reform is the political scenario that is also very different from the previous two decades. Not only was the winning president in the year 2000 not a member of the PRI, but also, at the state level, the composition of governors is much more diversified in terms of political parties. In this context, it is not clear at all which level of government has the incentives to press for tax decentralization. State governments seem to be more interested in getting extra resources from transfers, rather than taxation, which save them a political cost, whereas the federal government, at least during the 1980s and 1990s, seemed reluctant to give state governments more tax responsibilities, since it meant losing political control.

The contents of this paper are as follows. Section 2 presents a brief description of the evolution of fiscal intergovernmental relations in Mexico over the past two and a half decades, and describes the federal and state governments tax structure in Mexico. Section 3 presents a short description of the methodology followed in carrying out the RTS estimations. Section 4 comments on some of the results and findings. Finally, Section 5 presents the main conclusions.

## **2. THE MEXICAN CONTEXT**

### **2.1. Recent Evolution**

Fiscal intergovernmental relations in Mexico have changed over the past decades, but its general characteristics are the result of an intergovernmental coordination scheme that resulted from a fiscal reform in 1980. At that time not only was a Value-added Tax (VAT) introduced but the whole tax system was simplified. This coordination scheme, the Sistema Nacional de Coordinación Fiscal or National System of Fiscal Coordination (SNCF) is still in place in Mexico. It has in practice transferred the bulk of the tax responsibilities to the federal government. Before 1980, a sales tax—Impuesto Sobre Ingresos Mercantiles or ISIM—was collected and the central government retained 60

cents out of each peso collected, while the remaining 40 cents were for the state governments which had collected the tax. With the introduction of the VAT, the tax responsibility was fully transferred to the federal government and state governments received unconditional transfers (*participaciones*) in exchange.

States began to receive *participaciones* according to a compensatory criterion. After the VAT introduction in 1980 they received at least the amount of revenues they used to collect from the previous sales tax. However, the introduction of the VAT in general resulted in more revenues for all state governments. During the following years the criteria for distributing transfers to state governments were modified several times. At present, for each peso transferred to state governments, 45.17 cents are based on the size of the population, 45.17 are based on the territorial origin of a tax known as Impuesto Especial a la Producción y Servicios (IEPS)<sup>3</sup>, and the remaining 9.66 cents are in inverse relation to the previous two criteria. That is, this last criterion seeks to compensate those states that benefit relatively little from the first two criteria. As a result of these modifications some states have benefited relatively more than others, especially the most populated ones. However, overall, state governments have all benefited from this agreement because despite the poor fiscal performance of the country over the last several decades, in the period 1980-2002 the *participaciones* have grown at an average annual rate of 4 percent in real terms.

Trying to summarize the present situation on the income side, we can say that the scheme of fiscal coordination adopted in 1980 brought extra resources to state governments in the form of unconditional transfers (*participaciones*). Yet, that scheme also required that state governments transfer the tax collection capacity of the main tax basis to the central government. At present the taxation system is heavily concentrated in the federal government and it will be discussed in detail in the next subsection. Here it will suffice to note that, on average, nearly 90 percent of any state's income comes from *participaciones*,

On the expenditure side, while in the 1980s the system was heavily reliant on the central government, in the 1990s important changes occurred, moving expenditure responsibilities from the federal to state governments. Indeed, during the 1980s expenditure decisions were mostly taken at the federal level and, in general, the system

lacked rules for allocating expenditures. This led to a system that was not only concentrated at the federal level, but was also highly discretionary and often used to influence elections (see, for instance, Molinar and Weldon 1994). In the 1990s an important process of decentralization started in the areas of education and health. These processes continued throughout the decade and extended to some other areas such as social expenditure. In addition, an additional fund was created in 2000. Known as PAFEF, it was originally negotiated in Congress on a contingent basis, but subsequently it was incorporated in the so-called “*Ramo 33*.” The *Ramo 33* is a proportion of the budget that, by law, the federal government has to transfer to state governments. Thus, *Ramo 33* funds are conditioned transfers from the central State to state governments.

Unlike in the 1980s when there were no rules for allocating federal funds, the changes in the 1990s led to a much more transparent scenario. Today these funds are subject to stable formulas known to everybody. In cases like education expenditures, these formulas used to obey an historical inertia or were designed to incorporate several regional criteria, as was also the case of some funds in the area of social expenditures. Also, the resources transferred to state governments have increased significantly. Adding both conditional and unconditional transfers to state governments, in 2000 they represented seven percent of GDP, which is quite a significant amount, given that the states’ own tax revenues represented no more than 0.6 percent of GDP.

Taken together, all these modifications over the last two to three decades have created a very distorted scenario in which state governments have been getting increasing expenditure responsibilities and, at the same time, very limited tax capabilities to generate their own resources. The next section analyzes the tax structure of these two government levels in Mexico.

## **2.2. Tax Structure**

A high proportion of tax revenues in Mexico accrue to the central government. For instance, on average, over the last two decades (1981-2000), total public revenues, excluding social security, represented 18.9 percent of GDP, of which 17.6 were revenues collected by the federal government, and only 1.2 percent were state and municipal revenues, approximately 0.6 percent each (see Table 1).



TABLE 1

## Mexico

## Public Revenues as a Percentage of GDP

	1981–1990	1991–2000	1981–2000
A. Federal revenues	16.5	18.7	17.6
Oil taxes	4.6	3.2	3.9
Non oil taxes	10.7	10.8	10.8
Non tax revenues	1.1	4.6	2.8
B. Social security	2.3	2.9	2.6
C. State and Municipal revenues	1.2	1.1	1.2
Total income (A+B+C)	20.1	22.9	21.5

Source: Ministry of Finance (SHCP).

TABLE 2

## Main State Taxes

	Taxes	Number of States
1	Hotel Occupancy	27
2	Payroll	23
3	Lottery	22
4	Amusements and Public Spectacles	15
5	Local Car Ownership ( <i>Tenencia Local</i> )	13
6	Other	32
	<ul style="list-style-type: none"> <li>• Purchase-Sale of Mobile Goods</li> <li>• Purchase-Sale of Immobile Goods</li> <li>• Personal Remuneration</li> <li>• Professional Services</li> <li>• Public Instruments and Contracts</li> <li>• Direct Several Taxes</li> <li>• Other</li> </ul>	

Source: *Finanzas Públicas estatales y municipales de México. 1998-2001*. INEGI.

A very high proportion of federal revenues come from the so-called wide base taxes: income taxes, VAT, oil taxes, and taxes on gasoline, alcohol and tobacco (IEPS). In addition, a few other minor federal taxes are foreign trade taxes, taxes on new automobiles, and a federal tax on car ownership, although the revenues from these last two taxes are fully transferred to the states. In turn, state governments levy several taxes too but all of them of relatively reduced bases. Table 2 describes the main state taxes. It

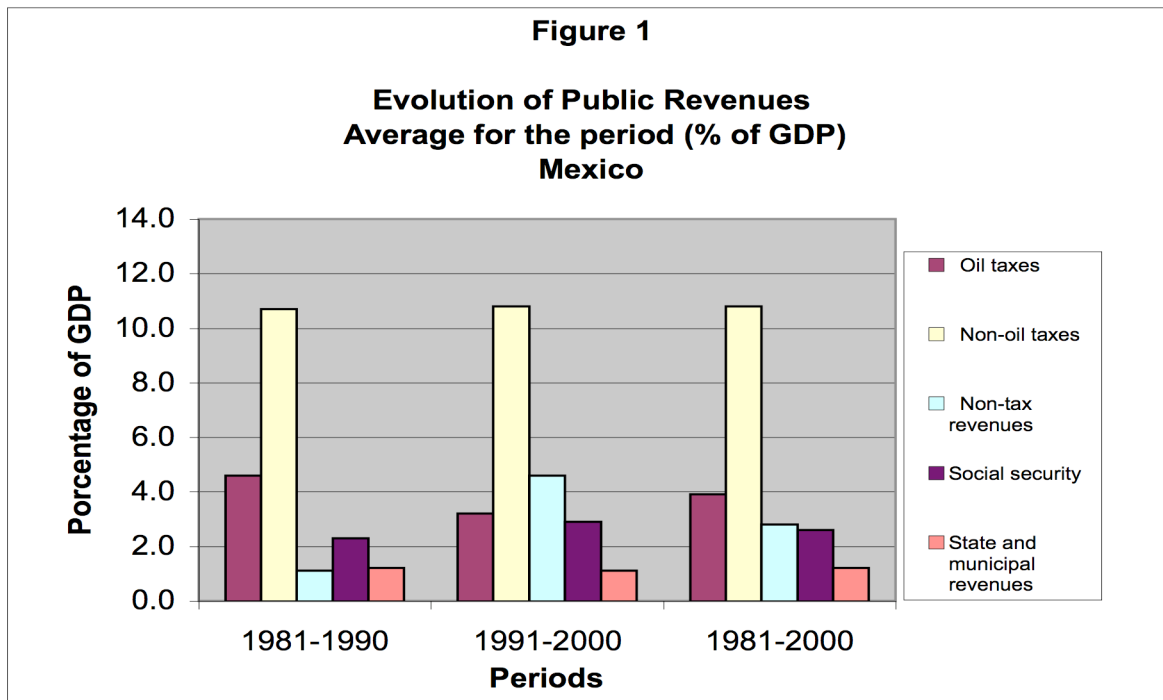
should be noted that not all taxes are necessarily imposed by all states. Thus Table 2 also shows how many states levy each tax, while Table 3 shows how many taxes are levied by each state.

<b>TABLE 3</b>	
<b>Number of Taxes Levied by States</b>	
<b>Mexico, 2003</b>	
<b>State</b>	<b>Number of Taxes</b>
12 Guerrero	9
02 Baja California	8
08 Chihuahua	8
14 Jalisco	8
18 Nayarit	8
29 Tlaxcala	8
05 Coahuila de Zaragoza	7
09 Distrito Federal	7
13 Hidalgo	7
26 Sonora	7
31 Yucatán	7
01 Aguascalientes	6
03 Baja California Sur	6
06 Colima	6
07 Chiapas	6
10 Durango	6
17 Morelos	6
20 Oaxaca	6
27 Tabasco	6
15 México	5
16 Michoacán de Ocampo	5
21 Puebla	5
22 Querétaro de Arteaga	5
24 San Luis Potosí	5
28 Tamaulipas	5
30 Vera Cruz-Llave	5
32 Zacatecas	5
19 Nuevo León	4
23 Quintana Roo	4
25 Sinaloa	4
04 Campeche	3
11 Guanajuato	3

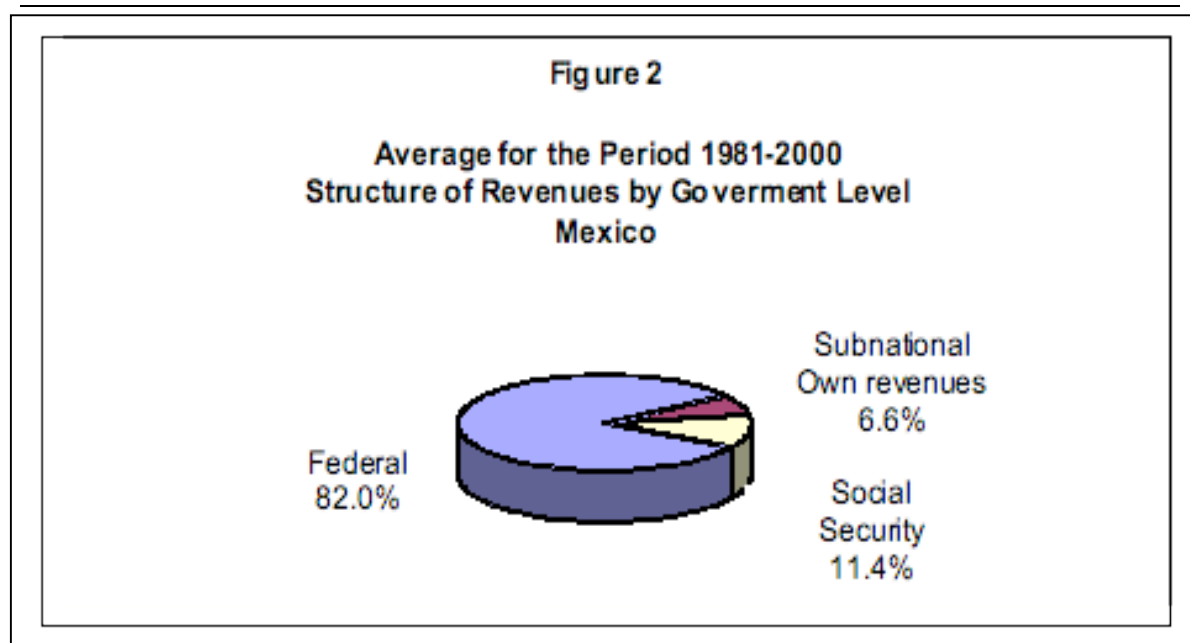
Table 3 shows Guerrero is the state that imposes the most taxes (9), while Guanajuato and Campeche levy only three taxes each. Also, the most common taxes by

state are Hotel Occupancy (30 states), Lotteries (27 states) and Payroll (23 states). These three taxes are also the most important in terms of the amount of revenues they generate at the state level. More than 90 percent of state tax revenues come from these three sources.

Also, it should be noted that all the taxes imposed by states are regressive in the sense that their tax rate does not depend on income levels, whereas the typical progressive tax in Mexico, the income tax, is levied by the federal government. In other words, the equity characteristics of the tax system in Mexico are in the hands of the federal government, which is a common practice in most countries.



Source: INEGI (2003a).



Source: INEGI (2002a).

In summary, the analysis of the tax structure by government level in Mexico confirms that tax revenues are heavily concentrated in the federal government since it levies the taxes whose tax bases are widest. State governments vary according to the number of taxes they impose. However, in all cases, state taxes correspond to relatively reduced tax bases and, in fact, only three of these seem to be relatively important in terms of revenue generated at the state level.

### **3. ESTIMATION OF TAX EFFORT AND TAX POTENTIAL**

#### **3.1. The Conceptual Basis of a Representative Tax System (RTS)**

The first part of this section presents a brief description of the methodology followed in estimating both tax effort and tax potential in a framework of what is known as a representative tax system (RTS). The second part describes the taxes to be considered in the analysis. The details of how tax base values were estimated and the corresponding data sources are presented in the appendix.

RTSs are a very common instrument for analyzing tax effort in different countries.<sup>4</sup> This approach is conceptually simple and, unlike an econometric approach,

RTSs give more insight into the particular contribution of specific taxes to the relative accumulated tax effort. The cost of that, however, is that RTSs are very demanding in terms of data requirements.

The essence of the methodology consists of estimating, for each state and each particular tax, an effective tax rate, defined as the ratio between tax collection and tax base value. The tax base should be a reasonable measure of tax capacity, thus avoiding the use of a tax base value as defined in the tax laws. What we need is a direct indicator of (or a good proxy for) tax potential. The next step is to calculate, for each tax, an average effective tax (non-weighted). Then the tax base value is multiplied by the average tax rate, thus generating an absolute value of tax potential for each state. This number represents the amount of tax revenue that each state could collect if it were exploiting its potential tax base to an average degree.

As a final stage of the process, adding all these amounts generates the amount of tax revenues that each state would be able to collect under the representative tax system. Dividing real tax collections by potential tax collections calculates a Tax Potential Index Use (TPIU) as well as a ranking of state tax effort. It also generates an estimation of tax capacity deficiencies in the poorer states.

In a more formal way, the procedure for estimating the TPIU can be described as follows:

$$\text{TPIU}_{sj} = \text{TC}_{sj} / \text{TP}_{sj}$$

where

$\text{TPIU}_{sj}$  = tax potential index use of state  $s$  and tax or source revenue  $j$ ,

$\text{TC}_{sj}$  = actual tax collection in state  $s$  from tax  $j$ ,

$\text{TP}_{sj}$  = potential tax collection in state  $s$  from tax  $j$ ,

and  $\text{TP}_{sj}$  is defined as

$$\text{TP}_{sj} = t_j^* (B_{sj})$$

where

$B_{sj}$  = tax base value of tax  $j$  in state  $s$ ,

$t_j^*$  = the national average tax rate for revenue source or tax  $j$ ,

and  $t_j^*$  is estimated as

$$t_j^* = \sum t_{sj}^c / s$$

where

$t_{sj}^e$  is the effective tax rate of tax  $j$  in state  $s$ ,

and is calculated as

$$t_{sj}^e = TC_{sj}/B_{sj}$$

These estimations refer to relative state tax effort. That is, since there are no absolute measures of tax effort or tax potential, the results compare each individual state against the national average for a particular tax, a group of taxes, or the whole tax system. Clearly, the conceptual challenge of this exercise is to find a good measure of tax base value for each tax, since we need a reasonable value or a good proxy, different from the tax base as defined by the tax code. Finding appropriate tax base values is challenging for a country like Mexico where, even though regional statistics have improved over the last decade, they still are insufficient and in some cases, like regional tax data on the main taxes, the information simply does not exist.

In deciding which taxes to analyze, we tried to include not only the most important in terms of revenue, but also as many as possible. In the evaluation of state tax effort, it very often happens that particular taxes perform very well in some states and not so well in others. What matters then is the overall tax effort of each state. These elements had to be considered in the strategic decision of defining which taxes should be included in the analysis.

Finally, the methodology has several limitations. First, the selection of independent variables (tax bases) is to some extent subjective because they cannot be subjected to a proof of statistical significance. Second, the data on tax basis are not always sufficiently disaggregated, so that some differences in tax capacity among states may remain hidden. Third, differences in terms of the impact of per-capita incomes on tax potentials are not accounted for. Despite these limitations, the fact that individual taxes can be linked to a potential tax base allows for a better understanding of *relative tax effort*, thus leading to valid and useful policy recommendations.<sup>5</sup>

## **3.2. Determining the Universe of Taxes and Estimating Tax Base Values**

### **3.2.1. Taxes considered in the analysis**

With the exception of the tax on oil exports and foreign trade taxes, all the existing taxes in Mexico were incorporated in the analysis. Most of them were included in an explicit manner while a few of the less important in terms of revenue were grouped in a single category. The list of included federal taxes is as follows:

#### Federal Taxes

- Personal income tax
- Corporate tax
- Value-added tax
- Tax on gasoline, alcohol, and tobacco (IEPS)
- Federal car ownership (*Tenencia Federal*)
- New cars (ISAN)

The revenues of the last two are fully transferred to state governments according to where the revenue was generated.

It is important to mention that income tax and VAT are both levied by the federal government. They are incorporated in the analysis because they are potential candidates for decentralization.

Insofar as existing state taxes are concerned, a strategic decision was taken to consider the most important ones explicitly, and to group several minor taxes in a single category. The list is as follows:

#### State Taxes

- Payroll
- Hotel occupancy
- Amusement and public spectacles
- Lotteries
- Other

### 3.2.2. Estimating tax base values

This section is devoted to making some general comments on some data problems. The data sources for the taxes considered here are described in the appendix.

While official data on tax revenues by state exists concerning VAT and income taxes, it is not very useful because it reflects where the tax was declared, but not where the transaction that was taxed occurred. This is significant problem because many firms, especially large and medium firms, operate in several states but for tax purposes register an address (usually in a big city like Mexico, Guadalajara or Monterrey). Therefore, the existing data on tax collection revenues by state is based on where the firm declared their taxes. In the case of small firms operating in a single state this should not be problem. For firms operating in more than one state, the data is not accurate for our purposes. To provide an idea of how distorted the data may be, suffice it to mention that in 2000, Mexico City contributed 22.8 percent to the GDP of the country and, according to the data on taxes, collected 54.2 percent of total personal income tax and 46.6 percent of VAT. Given this situation as far as data was concerned, it was necessary to estimate the territorial origin of both income tax and VAT.

For that purpose we used the estimations of Gamboa and Messmacher (2002), who allocated both taxes according to the state where the revenues were generated, distinguishing between personal income tax and corporate tax. Their exercise was based on information from the 2000 income-expenditure survey by INEGI (2002b), which allows us to classify data by state. They estimated both the consumption and income structure in order to estimate the structure of personal income tax and VAT. Insofar as the corporate tax is concerned, they allocated the tax by state, estimating the difference between the overall surplus by state minus interest payments and depreciation, according to the 1999 economic census (INEGI 1999).

It would have been convenient to estimate tax base values for more than one year to avoid errors or extreme behaviors, but several data bases are not published yearly. Also, whenever possible we estimated tax base values using different proxies to get more robust results. Finally, to the extent that we are using different data sources it is possible that some data inconsistencies are present in the estimations. Hopefully, these



inconsistencies should not be very important for two reasons. First, our year of analysis was the year 2000, whereas in some cases, like the economic census, for instance, the year of reference is 1998. However, when the source was not referenced to the year 2000, we took only the relative structure and applied it to the totals of the year 2000, assuming that it is very unlikely that in a year or two structures changed substantially. Second, even though we relied on different data sources, depending on the tax being analyzed, when it came to comparing the tax performances of states, we always used the same data source for all the states levying a particular tax.

## 4. ANALYSIS OF RESULTS

### 4.1. By Kind of Tax

Table 4 reports the value of the TPIU for all states and for all the taxes considered in the analysis. Index values that are below 1 mean that the tax effort of a particular state is below the national average. A value equal to 1 simply means that this state tax effort is equal to the national average. Values above 1 correspond to states whose tax effort is superior to the national average.

Starting with federal taxes, the results for personal income tax, corporate tax, VAT, IEPS, and ISAN (new cars), are reported in columns 1 to 5. Although results vary from tax to tax, an outstanding point in the cases of VAT, personal income tax, and IEPS is that, with few exceptions, both best and worst tax performances correspond to states classified as relatively more advanced from the economic point of view. For instance, among the states showing the best tax performances are Baja California Sur, Colima, Veracruz, Aguascalientes, and Campeche. At the opposite extreme, among the worst tax performers are relatively rich states too, such as Jalisco, Nuevo Leon, Distrito Federal, Puebla, and Estado de Mexico.

TABLE 4

## Tax Potential Index Use of Individual Taxes by States

State	Taxes										
	Income Tax (1)	VAT (2)	Corp. Tax (3)	IEPS (4)	New Cars (5)	Car Owner (6)	Payroll (7)	Hotel (8)	Amusements (9)	Lotteries (10)	Other (11)
01 Aguascalientes	1.57	1.29	0.70	2.18	1.13	1.05		0.77	3.57	0.25	0.61
02 Baja California	1.51	0.75	0.86	0.75	0.55	0.40	1.00	1.20	0.50	0.66	1.53
03 Baja California Sur	2.43	2.74	0.78	4.66	0.71	0.49	0.49	2.11			1.62
04 Campeche	2.55	0.87	4.05	3.40	0.75	1.27	1.61	0.74			0.01
05 Coahuila	0.53	0.55	1.21	0.40	1.20	0.90	0.52	2.02	0.59	0.64	0.36
06 Colima	2.17	2.27	0.48	2.99	1.05	0.98		0.82	0.06	1.53	0.85
07 Chiapas	0.59	0.83	1.46	0.54	0.70	1.25	0.92	0.55			0.48
08 Chihuahua	0.40	0.36	0.62	0.68	1.06	0.60	1.41	0.98		0.38	2.16
09 Distrito Federal	0.91	0.20	0.54	0.35	2.08	3.00	1.55	1.20	1.99	1.44	1.84
10 Durango	0.82	1.36	0.64	1.33	0.77	0.62	0.57	0.99		0.17	2.27
11 Guanajuato	0.85	0.58	1.23	0.62	1.09	0.87		0.79		1.97	0.89
12 Guerrero	0.68	1.01	0.44	0.80	0.63	1.05	1.24	1.07			2.51
13 Hidalgo	0.91	1.09	0.69	1.46	0.75	0.57	0.65				1.14
14 Jalisco	0.11	0.30	1.00	0.10	1.41	1.04	1.27	1.11	0.04	1.37	0.84
15 México	0.51	0.29	1.00	0.18	1.01	0.57	1.36			0.53	0.13
16 Michoacán	0.21	0.84	0.63	0.36	1.07	0.72				0.31	1.26
17 Morelos	0.87	0.95	0.66	0.82	0.93	0.80		0.26	0.25		1.00
18 Nayarit	1.81	1.97	0.67	0.38	0.61	0.81	0.62	1.30	1.29	1.02	3.06
19 Nuevo León	0.58	0.43	0.61	0.30	1.78	1.69	1.30	1.88		0.14	0.56
20 Oaxaca	0.44	0.62	0.56	0.11	0.48	0.74		0.72	0.16		0.15
21 Puebla	0.38	0.32	0.59	0.18	1.29	1.38	0.62	0.87		0.98	0.17
22 Querétaro	2.22	1.12	1.06	0.45	0.83	1.23		0.83	0.92		0.97
23 Quintana Roo	1.61	0.92	0.68	3.90	1.45	1.70	1.56	1.83			0.17
24 SanLuis Potosí	0.11	0.65	0.84	0.26	0.92	0.81	0.40	0.74		0.07	0.48
25 Sinaloa	0.23	0.71	0.72	0.49	0.98	0.71	0.86	0.92		5.70	0.97
26 Sonora	1.24	0.92	0.97	0.51	0.99	0.66	1.03			0.64	2.62
27 Tabasco	2.13	1.10	5.07	0.98	1.03	1.77	0.49	1.00		0.39	0.42
28 Tamaulipas	0.43	0.55	0.82	0.82	1.89	0.80	1.39	0.55	0.31	1.60	0.49
29 Tlaxcala	0.10	1.77	0.81	0.35	0.52	0.64	0.93		2.82		0.09
30 Vera Cruz-Llave	1.86	2.04	0.56	1.02	0.82	1.17		0.43	2.13	1.00	0.39
31 Yucatán	0.12	0.59	0.54	0.31	1.02	1.35	1.20	0.81	0.36	1.19	0.45
32 Zacatecas	1.12	2.01	0.50	0.31	0.49	0.37		0.50			1.51

These results appear to be counterintuitive. However, there are two explanations for the results. First, one consequence of the low economic growth and poor fiscal performance of the last twenty five years is that an increasing share of the economic activity is in the informal sector, and there is growing tax evasion and tax elusion. These

consequences normally appear in large urban areas, as is the case of Mexico City, Guadalajara, Monterrey, Puebla, and Toluca, all of which are the capitals of their states. In other words, although these states are expected to be the main contributors to tax revenues, they also suffer the largest proportion of informal and illegal activities. A second important reason is that the best tax performances occur in states that are relatively rich but have medium-sized capital cities, such as Colima, Aguascalientes, or Baja California Sur. In other words, these states are relatively more advanced and, at the same time, do not suffer the concentration effects of the “too large” cities.<sup>6</sup>

The case of the tax on new cars (ISAN) shows behavior opposite to the three taxes discussed above. Among the states having the best performances are Mexico City, Tamaulipas, Nuevo Leon, Quintana Roo, and Jalisco. The worst performances occur in states like Oaxaca, Zacatecas, Tlaxcala, Baja California, Nayarit, Guerrero, and Chiapas. The results are not surprising because, given that the tax is on new cars, the activity takes place only in the formal sector and, therefore, the existence of tax evasion is more unlikely. The result also makes sense to the extent that the states showing poor tax performances characteristically have a high number of illegal cars, belonging to Mexican immigrants to the US who return home from time to time, as is the case in Oaxaca, Zacatecas, Tlaxcala, Nayarit, and Guerrero, or are located on an international border, as is the case with Baja California or Chiapas.<sup>7</sup>

The last federal tax is the corporate tax. Unlike the previous federal taxes, in this case it is more difficult to find an explanation for its behavior. Perhaps an important consideration is that, with the exception of Coahuila, the best performances occur in states where a single public firm plays a very important role in the local economy, as is the case of the oil and electricity companies (PEMEX and CFE).

The analysis of state taxes is more complex because not all taxes are imposed by all states. Also, since states may differ substantially in their economic specialization activities, it is likely that particular states may perform differently, depending on the state, its main economic activity, degree of economic development, location, and so on.

The car owner tax (*Tenencia*), in Column 6 of Table 4, shows the joint (aggregated) behavior of federal (*Tenencia Federal*) and state taxes (*Tenencia Estatal*). The federal tax applies to all states, and the revenues are fully transferred to the states

whereas the state tax is imposed in only 13 states, and applies only to cars older than 10 years. The performance of this tax among states is therefore, not surprisingly, similar to the tax on new cars mentioned above. Its performance is associated with the existence of illegal vehicles or imported used cars in the border cities. Thus, the worst performances occur in states like Zacatecas, State of Mexico, Baja California, Baja California Sur, and Chihuahua. The first two states are characterized by large rural areas, which send migrants to the US and, because of that, they are the states where most of the illegal cars end up. The last three states have major cities on the border with the United States. At the opposite extreme, the best tax performances occur in Mexico City, Nuevo Leon, Puebla, Tabasco, and Quintana Roo. Without providing empirical evidence, it appears that illegal vehicles tend to go to large rural areas where, unlike in urban areas, it is more difficult to be detected.

The next tax is the Payroll Tax, in Column 7. This is the main state tax, and it is not only measured by the amount of revenue collected but also by the number of states levying the tax (23 in total). The best performances correspond to Campeche, Quintana Roo, Distrito Federal, Chihuahua, Tamaulipas, Nuevo Leon, State of Mexico, and Jalisco. The worst performances are by San Luis Potosi, Baja California Sur, Tabasco, Durango, Nayarit, and Hidalgo. While it is difficult to establish a clear pattern of behavior, some interesting points emerge. With the exception of Campeche and Quintana Roo, the remaining states mentioned as best performers all have important degrees of economic diversification, like Mexico City, Nuevo Leon, Mexico, and Jalisco, and to a lesser degree, Chihuahua and Tamaulipas. The cases of Quintana Roo and Campeche are explained by the importance of the oil company PEMEX in Campeche and tourism activity in Quintana Roo (Cancun). On the other hand, most of the states showing the worst performances are in less diversified and less industrialized regions that are more oriented towards agriculture.

The tax that follows, on Hotel Occupancy, is imposed by 27 states (Column 8). Among the best state tax performances are Baja California Sur, Coahuila, Nuevo Leon, Quintana Roo, Nayarit, Baja California, and Mexico City. The worst performances correspond to Morelos, Veracruz, Zacatecas, Chiapas, Tamaulipas, Oaxaca, and San Luis Potosi. The results are interesting because both best and worst performances occur in

states where tourism is an important economic activity, either through associated business as in the case of the Distrito Federal, Nuevo Leon, and Baja California, or in typical leisure resorts. It appears that the tax performance of the states is correlated to a relative degree of economic development. Moreover, with the exception of Nayarit, among the states showing best tax performance are places characterized by a modern and well developed tourism infrastructure for foreign tourism. On the other hand, states showing the worst performances are characterized by a less developed tourism infrastructure and/or by receiving mainly domestic tourism.

The Tax on Amusements and Public Spectacles is imposed by 15 states and the results of the estimations of tax potential are shown in Column 9. Here the results are very much as expected. Among the best tax performances are Aguascalientes, Tlaxcala, Veracruz, and Mexico City. These states are all well known for their yearly fairs or national expositions and, as is the case of Mexico City, as having a high concentration of these activities, as explained in the Appendix. These results used state savings as a proxy for the tax base value but additional estimations were carried out using the value added of the sector according to the economic census, and the results remained practically the same.

The Lottery Tax is levied by 22 states, and the results are reported in Column 10. Looking at the best and worst tax performances, it is difficult to establish a clear pattern of behavior. Perhaps the only thing worth mentioning is that they seem to be quite robust since the results do not change if instead of using state savings we use state GDP as a proxy for the tax base.

To conclude this section on state taxes, Column 11 reports the remaining minor taxes grouped in a category called "other taxes." This category is hard to analyze because, strictly speaking, ranking comparisons are not valid since states do not necessarily impose the same number of taxes. However, this estimation will be useful for analyzing the overall tax system performance of states, which is the purpose of the next subsection.

## 4.2. By State

The results of the total tax effort and tax potential by state are reported in Table 5. Table 5 was constructed by adding up all the taxes so that the resulting TPIU is an indicator of total state tax effort; that is, it refers to the tax system as a whole for each state and not to a particular tax, as was the case in the previous subsection. The last column of Table 5 presents a ranking of the TPIU, where 1 indicates the best performance and 32, last place.

The results are very similar to the VAT and personal income tax, which is not surprising given the importance of these two taxes in terms of revenue. The overall performance of the tax system confirms that the best tax performances occur in rich states whose capitals are medium-size cities whereas the worst performances take place in rich states too, but with large capital cities.

Table 6 shows what we call the per-capita lag of tax effort, which is an additional variable to evaluate tax potential and is not comparable with our previous estimates. This variable is calculated, for each state, as the difference between the state per-capita tax potential and the national per-capita tax potential. Positive numbers indicate state per-capita potentials above the national average and negative numbers reflect states which lag behind the per-capita national average. The states best positioned are Mexico City, Nuevo Leon, Jalisco, and Baja California, among others. At the opposite extreme, among the states lagging behind appear Chiapas, Oaxaca, Tabasco, Guerrero, and Hidalgo.

The results bring an additional perspective to the analysis. If tax potential is adjusted by population, the resulting rankings change dramatically, which suggests that, apart from efficiency, when taxes are to be decentralized other elements have to be taken into account. The point is particularly relevant in a country like Mexico, characterized by very strong regional heterogeneity in terms of population, income, administrative capacities, and education levels, as well as other differences.

TABLE 5

## State Aggregated Tax Potential

## Summary

State	Tax Collection* MP (1)	Tax Potential** (MP) (2)	TPIU *** (3=1/2)	Ranking (4)
01 Aguascalientes	16242948	12002960	1.35	6
02 Baja California	36601355	39874351	0.92	12
03 Baja California Sur	14256881	5558379	2.56	1
04 Campeche	17355225	9058225	1.92	4
05 Coahuila de Zaragoza	19954586	32075532	0.62	21
06 Colima	10493888	5346878	1.96	3
07 Chiapas	13669683	16244599	0.84	15
08 Chihuahua	20333409	41502674	0.49	24
09 Distrito Federal	79134902	183733289	0.43	29
10 Durango	14099004	12557187	1.12	7
11 Guanajuato	28312474	38241503	0.74	19
12 Guerrero	14058920	17019372	0.83	17
13 Hidalgo	13019691	12872181	1.01	11
14 Jalisco	27353153	93321589	0.29	32
15 México	50127651	114040847	0.44	28
16 Michoacán de Ocampo	14389473	25741253	0.56	23
17 Morelos	11412771	13330958	0.86	14
18 Nayarit	9481328	8712846	1.09	8
19 Nuevo León	32938303	69517371	0.47	25
20 Oaxaca	7956692	20660580	0.39	30
21 Puebla	15089265	42602612	0.35	31
22 Querétaro de Arteaga	21069790	20122207	1.05	10
23 Quintana Roo	12288649	11321996	1.09	9
24 San Luis Potosí	10263587	22367357	0.46	26
25 Sinaloa	13257654	23143817	0.57	22
26 Sonora	24492397	27890931	0.88	13
27 Tabasco	23498108	11649079	2.02	2
28 Tamaulipas	19214059	30287335	0.63	20
29 Tlaxcala	6992278	9043770	0.77	18
30 Vera Cruz-Llave	67431227	44616319	1.51	5
31 Yucatán	6676530	14858677	0.45	27
32 Zacatecas	11496073	13715897	0.84	16
<b>Total</b>	<b>682961954</b>	<b>1043032573</b>	<b>0.65</b>	

\*Sum of all tax collections. federal and state.

\*\*Sum of tax potential of all taxes. federal and state.

\*\*\*Tax Potential Index Use.

TABLE 6

## Per-Capita Lag of Tax Potential

## Adjusted by Population

State	Global Tax Potential (1)	Population* 2000 (2)	Per Capita Tax Potential (3=1/2)	Lag** (4)
01 Aguascalientes	12002960	940778	12.8	2.2
02 Baja California	39874351	2476010	16.1	5.5
03 Baja California Sur	5558379	418962	13.3	2.7
04 Campeche	9058225	687572	13.2	2.6
05 Coahuila de Zaragoza	32075532	2287816	14.0	3.4
06 Colima	5346878	536650	10.0	-0.6
07 Chiapas	16244599	3912081	4.2	-6.4
08 Chihuahua	41502674	3037366	13.7	3.1
09 Distrito Federal	183733289	8550170	21.5	10.9
10 Durango	12557187	1440899	8.7	-1.9
11 Guanajuato	38241503	4648460	8.2	-2.4
12 Guerrero	17019372	3063380	5.6	-5.0
13 Hidalgo	12872181	2226763	5.8	-4.8
14 Jalisco	93321589	6293460	14.8	4.2
15 México	114040847	13058570	8.7	-1.9
16 Michoacán de Ocampo	25741253	3959772	6.5	-4.1
17 Morelos	13330958	1545775	8.6	-2.0
18 Nayarit	8712846	910241	9.6	-1.0
19 Nuevo León	69517371	3812758	18.2	7.6
20 Oaxaca	20660580	3419524	6.0	-4.6
21 Puebla	42602612	5054788	8.4	-2.2
22 Querétaro de Arteaga	20122207	1398148	14.4	3.8
23 Quintana Roo	11321996	870918	13.0	2.4
24 San Luis Potosí	22367357	2290332	9.8	-0.8
25 Sinaloa	23143817	2522862	9.2	-1.4
26 Sonora	27890931	2192455	12.7	2.1
27 Tabasco	11649079	1883620	6.2	-4.4
28 Tamaulipas	30287335	2735624	11.1	0.5
29 Tlaxcala	9043770	957705	9.4	-1.2
30 Vera Cruz-Llave	44616319	6883273	6.5	-4.1
31 Yucatán	14858677	1650949	9.0	-1.6
32 Zacatecas	13715897	1347186	10.2	-0.4
<b>Average</b>			<b>10.6</b>	

Source: XII Censo General de Población y Vivienda 2000. Tabulados de la muestra censal.

Cuestionario ampliado.

\*\*Calculated as the difference between the Per-Capita Tax Potential of each state and the National Average Tax Potential.



So far the analysis has concentrated on state tax potential either for a particular tax or the tax system as a whole. Another interesting way to look at results is to decompose the contribution to the national tax performance of each particular tax across the territory. Table 7 shows the net impact of taxes on the total national tax effort. For a correct interpretation, positive or negative numbers in column 4 represent the net contribution of a particular tax to the *cum* performance tax effort, which may be below the average (negative sign) or above the average (positive). The relative structure is interesting because, with the exception of ISAN, all the federal taxes perform below the average, while in the case of state taxes, only two are slightly below the national tax potential (Amusements and Lotteries). This consideration is important because, rather than analyzing state tax performance, the results show in fact the federal government tax performance across the territory, at least in the cases of federal taxes. Interpreting the results in this manner, one can conclude that states displayed a better tax performance vis a vis the federal government.

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**TABLE 7**

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**Net Impact of Each Tax on the Total National Tax Effort**

Tax	Tax Collection (1)	Tax Potential (2)	TPIU**** (3=1/2)	Net Proportional Impact (4)*
Others	2833427	2648626	1.07	0.000
Amusements	122808	152346	0.81	0.000
Hotel Occupancy	501013	491816	1.02	0.000
Lotteries	266752	321150	0.83	0.000
Payroll	11100759	10120229	1.10	0.001
Car Ownership	8583587	7850230	1.09	0.001
IEPS	99977185	231355514	0.43	-0.126
Personal Income Tax	132286304	168331063	0.79	-0.035
Corporate Tax	149173918	176987722	0.84	-0.027
New Cars	4659703	3865176	1.21	0.001
VAT	273456498	440908701	0.62	-0.161
<b>Total</b>	<b>682961954</b>	<b>1043032573</b>	<b>0.65</b>	<b>-0.345</b>

\*\*\*\*Tax Potential Index Use.

\*Net Impact = [(1)-(2)]/Sum of (2)

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## 5. CONCLUSIONS

This paper presents the results of an RTS constructed for Mexico that analyzes state tax effort and, more important, state tax potential. The RTS provides valuable information for designing a tax decentralization strategy, or simply a change in the formula for distributing unconditional transfers to states.

RTSs are very often constructed for other countries and the methodology is certainly not new. However, RTSs are normally heavy regional-data-demanding systems and it is perhaps this last point that explains why the RTS presented here is the first effort of this nature in Mexico. Regional statistics in Mexico are not abundant. Fortunately, over the last several years regional data have gradually improved both in quantity and in quality. The results presented here are proof of that. Hopefully, the RTS presented here will be followed by other ambitious efforts to obtain not only more reliable but more robust results. In the meantime, the analysis of the results presented here leads to some initial conclusions.

First, the distribution of tax responsibilities between federal and state government levels in Mexico is heavily concentrated at the federal government in terms of revenue. This is because the federal government levies the taxes with the widest fiscal basis. State governments impose several taxes but on a very reduced basis. Thus, despite the changes that have taken place over the last few years in Mexico, on the revenue side state governments depend heavily on transfers from the central government.

Second, the analysis of the results of the RTS reveals the following pattern: with some exceptions, both the best and the worst tax performances occur in relatively rich states. The difference, however, is that the best positioned states are those whose capital cities are of medium size, as is the case of Aguascalientes, Colima, Veracruz, Baja California Sur, etc. The worst tax performances occur in states characterized by large capital cities, as is the case of Mexico City, Jalisco, Estado de Mexico, Puebla and, to a lesser degree, Nuevo Leon. The exception in this last group seems to be Oaxaca, which is one of the relatively poorest states in Mexico. The results suggest that large cities concentrate not only economic activity but also the typical problems of large cities, such as large informal sectors, tax evasion, tax elusion, and other illegal activities.

Third, if the analysis is modified and adjusted by population it shows that state tax efforts are conditioned by their heterogeneity. The point is relevant in a country like Mexico, characterized by accentuated regional disparities. In particular, it seems that while efficiency is a relevant criterion, it is certainly not the only criteria to be considered. Additional elements have to be taken into account when designing a strategy for tax decentralization, such as regional socio-economic disparities and unequal administrative capacities, to mention a few.

Fourth, a comparison of state and federal taxes shows that state taxes are close to the national average, whereas the performance of federal taxes is significantly below the national average. This result suggests that states are doing a “better” job of taxation than the federal government does in the states’ territory. However, it could also suggest that the federal government is responsible for the more complex taxes.

Fifth, relative state tax performance is in principle determined by the number of taxes they impose. However, some states showed relatively good tax performance and, at the same time, levied relatively few taxes. A few states did not levy payroll tax, even though this is by far the most important state tax in terms of revenue. However, states may be competing for investment. This could suggest the existence of healthy tax competition, but this hypothesis needs empirical support.

Finally, the quantitative results presented here are a valuable input for redesigning a scheme of intergovernmental fiscal relations. Future reforms could transfer more taxation responsibilities to state governments or they could simply change the formula for the distribution of unconditional transfers (*participaciones*). In any case, it will be important to keep in mind that the regional heterogeneity of the country will surely demand a strong federal government and therefore impose limits on how far a tax decentralization attempt can go, so as not to weaken social policy.

## **Appendix**

### **Tax Base Values**

#### *Personal Income Tax*

To estimate the tax base value it was necessary to allocate income by state. This was achieved using the aggregate 2000 GDP as income and allocating it by state according to the amplified questionnaire of the National Population Census (INEGI 2001). This questionnaire disaggregates households according to incomes levels expressed as multiples of a minimum salary as in the law. The advantage of using this indicator instead of simple state GDP data is that extra information on income distribution was incorporated.

#### *Corporate Tax*

The tax base value for this tax was a simple measure of state GDP in 2000.

#### *Value Added Tax*

While one could argue that a natural candidate here would be state GDP, a more careful consideration suggests that ultimately the VAT is paid by final consumers. Therefore, a more appropriate definition of tax base here is the amount of income devoted to consumption. To approximate this concept we first calculated state savings and then state consumption was obtained by deducting savings from incomes at the state level. Clearly, this exercise assumed that state GDP equaled state disposable income.

#### *Tax on gasoline, alcohol, and tobacco (IEPS)*

Here the best indicator of the tax base value was the value added of the sectors Gasoline (6260), Tobacco (3140), and Beverages (3130), as reported in the 1999 economic census (Censo Económico, INEGI 1999).

#### *Car ownership (Tenencia Federal)*

For this particular tax we again used the amplified questionnaire of the population census where households are classified according to whether or not they have a car, by state. We

then assumed an average value of 50,000 pesos a car. It is important to mention that the federal government used to operate a national census of vehicle registrations but stopped in the eighties.

#### *New cars (ISAN)*

We used the same base value as with the personal income tax. The assumption here is that the purchases of new cars are highly correlated with income levels.

#### *Payroll Tax*

We used value of remunerations by state, according to the economic census, INEGI (1999).

#### *Hotel occupancy*

Estimated value of rooms available in the year 2000, according to information from yearly statistics by state (*Anuario Estadístico por Entidad Federativa*, INEGI 2003b).

#### *Amusements and public spectacles*

We used a proxy state savings, as explained with the VAT tax above. The assumption was simply that this kind of consumption is highly associated with leisure.

#### *Lotteries*

The same as the previous (state savings).

#### *Others*

State GDP

## ENDNOTES

<sup>1</sup> In some cases, like education, the starting point for allocating resources obeyed an historical inertia, rather than a specifically designed formula.

<sup>2</sup> Perhaps with the exception of the first years of the 1990s (see Hernandez 1997).

<sup>3</sup> It is a tax on gasoline, tobacco and alcohol.

<sup>4</sup> For the United States see for, instance, the reports of the United States Advisory Commission on Intergovernmental Fiscal Relations (1990, 1986, 1971, 1962).

<sup>5</sup> For a critical review of RTS, see Bird and Slack (1990).

<sup>6</sup> For a classification of states according to the degree of economic and social development see CONAPO (2002).

<sup>7</sup> In cities on international borders, particularly on the border with the United States, a very common (and legal) practice is the use of US secondhand cars.

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