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Fiscal Performance of Local Governments in Mexico: The Role of Federal Transfers

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Abstract

This paper is part of the research activities of the Program of Budget and Public Expenditure at CIDE, under the auspices of the Ford Foundation. It analyzes the effects of federal transfers on the tax effort of Mexican municipalities. There is some preliminary evidence that the federal aid has produced fiscal substitution among local governments: policymakers prefer to rely on federal funds to finance local initiatives, rather than increasing local taxes. The document presents some estimation models to test that proposition using data from all municipalities of Mexico. Its principal findings tend to support the fiscal substitution hypothesis in the case of the conditional grants created in 1998 to finance basic infrastructure projects. The paper also describes the principal features of the intergovernmental fiscal arrangement created in the Eighties, and shows the strong dependency of local governments with respect federal funds in the last ten years. It attempts to make a contribution to the current debate about reforming the fiscal federalist system in Mexico, by showing how intergovernmental transfers might deteriorate local tax effort. I am grateful to Robert Wilson, Shama Gamkhar and Peter Ward, professors of The University of Texas at Austin, and to Enrique Cabrero and Fausto Hernandez, professors from CIDE, for their valuable comments to an earlier draft of this paper. I also acknowledge Juan Pablo Guerrero for his support for this research.

Resumen

Este documento forma parte de la agenda de investigación del Programa de Presupuesto y Gasto Público del CIDE, con financiamiento de la Fundación Ford. Analiza los efectos de las trasferencias federales sobre el esfuerzo fiscal de los municipios mexicanos. El argumento que se intenta demostrar es que las transferencias federales han generado un fenómeno de sustitución fiscal entre los municipios: los gobiernos locales prefieren financiarse mediante fondos federales, en lugar de aumentar sus propios impuestos. Se presentan algunos modelos de estimación para someter a prueba dicho argumento, utilizando información de todos los municipios del país. Los resultados parecen confirmar la hipótesis de sustitución fiscal en el caso de las transferencias condicionadas que el gobierno federal introdujo en 1998 para financiar obras de infraestructura básica. También se describen los rasgos principales del sistema de coordinación fiscal mexicano creado durante la década de los ochenta, y muestra la profunda dependencia de los gobiernos locales en relación a los fondos federales durante los últimos diez años. El documento intenta contribuir al debate

actual sobre la reforma al federalismo fiscal mexicano, mostrando que las transferencias intergubernamentales pueden desalentar el esfuerzo fiscal local. Agradezco a Robert Wilson, Shama Gamkhar, y Peter Ward, profesores de la Universidad de Texas en Austin, y a Enrique Cabrero y Fausto Hernández, profesores del CIDE, por sus valiosos comentarios a una versión previa de este documento. Expreso mi gratitud a Juan Pablo Guerrero por su apoyo a esta investigación.

Introduction[*]

In recent times, great attention has been placed in understanding the policymaking processes and outcomes of local governments in Mexico. One of the most salient issues is the question of local fiscal behavior, particularly the factors influencing tax collection decisions not only in the Mexican case, but also in countries where governments have adopted decentralization policies to improve the efficiency and effectiveness in the provision and financing of public services (see Litvack, 1998). Decentralization has been considered as a major strategy for improving the efficiency in the allocation of public expenditures, since local governments are closer to the needs and preferences of constituents. However, the expected benefits from decentralization might not emerge if the intergovernmental fiscal system creates wrong incentives in the local policymaking process[1]. Specifically, intergovernmental transfers might discourage local governments from raising own-source revenues. If spending is assigned locally but the financing of services remains heavily dependent on federal funds, local governments might not put the appropriate fiscal effort. In the long run, such an outcome prevents the development of an adequate local governmental capacity.

This paper analyzes the effects of federal grants on the fiscal effort of Mexican municipalities. Federal aid comprises the principal source of revenue of states and municipalities in Mexico, and its importance has increased significantly particularly in the last four years, after new conditional transfers were introduced in 1998 to help local governments to finance infrastructure projects. There is some preliminary evidence that federal aid has produced fiscal substitution among local governments. Given the choice, a policymaker prefers to rely on federal money to finance local public goods, instead of increasing local taxes. Furthermore, the strong electoral competition and party alternation that characterize today's Mexican municipalities might have reinforced the tendency of local governments to reduce their tax effort, since enforcing tax collection would imply political costs that local leaders might not be willing to bear.[2] The implications for local governance are important, since subnational governments in Mexico might not be building an adequate institutional capacity to fulfill the new responsibilities assigned to them by decentralization and democratization at the local level.

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[1] Several scholars have pointed out the issue of wrong incentives in decentralization. They claim that an inappropriate policy design might produce adverse effects on macroeconomic stability, allocative efficiency and the cost-effective provision of local public services. Two of the most cited works on the dangers of decentralization in developing countries are the articles by Prud'homme (1995), and Tanzi (1995).

[2] This outcome would be consistent with political business cycle arguments. These theories assert that governments tend to run larger deficits in electoral times, since politicians are more likely to use expansionary fiscal policies to increase the probability of their reelection (for a review of this hypothesis see Nordhaus, 1975). Despite the fact that reelection of municipal presidents in Mexico is forbidden, local governments might yet be willing to sustain fiscal deficits to assure the permanence of the governing party in the next election.

The structure of the paper is the following. In the first section, I present some findings on literature addressing the issue of state and local fiscal performance in the Mexican case. Then I briefly describe the main features of the fiscal federalist arrangement in Mexico, in order to give the reader some notion about how the system works. In the third section I show the recent evolution of local public finances in Mexico, emphasizing the strong dependence of municipalities on federal grants, and the large disparities between local governments in their ability to raise tax revenues. Then, I estimate three regression models to assess the effects of federal grants on own-source local tax revenues, using data from almost all municipalities in Mexico. Finally, I present the conclusions and policy implications of the analysis.

Findings of the literature

What do we know currently about the fiscal performance of local governments in Mexico? Most empirical research has focused on the fiscal behavior of states, rather than localities. Many have described how the present system precludes subnational governments from assuming further fiscal responsibilities and have proposed ways to increase the taxing powers of regions without encouraging tax competition among them (Sempere and Sobarzo, 1998). Others have analyzed the determinants of state deficits. Hernandez (1997), for example, argues that the federal government tends to bailout states that default on their debt, thus inducing them to run large deficits. Velazquez (1999), on the other hand, explains variations in fiscal behavior between Mexican states by including political factors such as the political careers of state governors and electoral competition. He finds that governors, whose careers are more linked to their regions rather than to the federal government, tend to support larger deficits; he also concludes that electoral competition increases deficits.

Within the research related to municipal fiscal performance, a study by Cabrero (2000) shows that the rapid growth of tax revenues during the five years before the 1995 economic crisis was due mainly to urban municipalities. He shows also that urban localities are those exhibiting better indicators of fiscal performance, such as financial capacity and autonomy, although these indicators have been decreasing since 1992. This study, however, does not explain variations between urban municipalities. Rojas (2000) explains differences in the performance of local public expenditure across municipalities —measured by the change in the access of households to basic public services—, incorporating electoral competition as a key explanatory variable. Based on the theory of contestable markets applied to local governments, he anticipated a positive relationship between electoral competition and performance, but his results do not support that hypothesis. A recent piece of research (Raich, 2001) explicitly addresses the problem of fiscal substitution in Mexican municipalities. The author analyzes the impacts that the creation of a new federal grant in 1998 had on the tax effort of 217 municipalities of Puebla. His study compares municipal tax effort levels before and after the creation of this new fund, using descriptive statistical methods. His results seem to support the hypotheses that the new fund decreased local tax effort. Finally, Ibarra *et. al.* (2001) present an empirical analysis to test the influence of several changes introduced to the fiscal coordination system in Mexico, on the degree of dependence of municipalities with respect to revenue-sharing transfers from the federal government. These authors did not confirm the hypothesis that the creation of the fiscal coordination system in 1980 increased the dependence of municipalities with respect to the federal aid. On the other hand, they found that the constitutional reform of 1983, which allowed municipal governments to administer and enjoy the proceeds from property taxes and carry out several spending responsibilities, increased local financial dependence. However, given that they used aggregated data at the national level, they did not explain variations between local governments.

My contribution to this body of literature is to analyze the fiscal substitution hypothesis in the Mexican case, using data from all municipalities within a regression framework. In addition, my study does not look at one type of grant only, but evaluates separately the effects of both conditional and unconditional transfers on tax revenues.

Overview of Mexican fiscal federalism

The current intergovernmental fiscal arrangement of Mexico was first established in 1980, with the creation of the National System of Fiscal Coordination, an institutional mechanism to organize the whole fiscal system to prevent double or even triple taxation on a single source of income. States voluntarily joined the system, giving up several taxing powers in exchange for revenue-sharing grants from the federal government, who was entitled to levy the most important taxes, such as the income tax, the value-added tax (created in 1979 to replace a federal sales tax and some state-level excises), and a special tax on production and selected services[3]. These three taxes represent, together, almost 90 percent of all federal tax revenues. Several funds comprise the current revenue-sharing system, but the three most important are the following: *a)* the *Fondo General de Participaciones* (FGP), constituted of 20% of federal tax revenues coming from "assignable" or "shared" taxes[4]; *b)* the *Fondo de Fomento Municipal* (FFM), integrated with a 1 percent of the same federal tax pool, and transferred completely to municipalities via the states; *c)* all revenues from the vehicle use tax (*tenencia*) and the new vehicles tax, both federal taxes, are transferred to the states.

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[3] It is important to note that, despite the fact that state governors have the legal power to withdraw from the system at any time, no one has chosen to do so since its creation. For a good description of the changes to the fiscal coordination system in Mexico until 1995, see Arellano (1996). The author argues that, despite the efforts made by such changes to increase the tax efforts of regions and localities, these jurisdictions remain in deficit. For a description of the most recent changes to the system see Courchene, Diaz-Cayeros and Webb (2000).

The first revenue-sharing fund, the FGP, is by far the most important one. Its distribution among the states is driven by the following criteria: 45.17 percent of the fund is distributed on an equal per capita basis, 45.17 percent is allocated according to relative state tax effort[5], and the remaining 9.66 percent is given out in inverse proportion to the other two criteria, to compensate states with low capacity to generate revenues. An important element of this fund is that states are required to distribute at least 20 percent of their share to their municipalities. However, one shortage is that the method used by states to distribute revenue-sharing grants to their municipalities is not transparent in general[6].

Despite the fact that the taxing powers of states and municipalities were drastically reduced as a result of the revenue-sharing system, municipalities were allowed by the national Constitution in 1983 to retain all the proceeds from the property tax. However, it should be noted that municipalities do not have legal authority to modify tax bases and rates, since this is a prerogative of state legislatures. Therefore, municipalities are only responsible to enforce the collection of property taxes. In addition to the revenue-sharing grants and the proceeds from the property tax, municipal governments have other sources of revenue, such as the fees obtained from the provision of local public services, and some other small surcharges. Municipal governments can contract debt, but they need the approval of their state legislatures. The constitutional reform also assigned new spending responsibilities to municipal governments, primarily the provision of basic local infrastructure such as water supply, sanitization, public safety, and local transportation.

The most recent reform made to the fiscal intergovernmental arrangement in Mexico was the creation in 1998 of a new item in the federal budget, the *Ramo 33*, which was transferred to states and municipalities to finance expenditure programs that the federal government decentralized during the 1990 decade to states and municipalities: education and health (to states), and basic local infrastructure (to municipalities). The two new earmarked funds for municipal governments were the *Fondo de Aportaciones para la Infraestructura Social Municipal* (Municipal Social Infrastructure Support Fund, FAISM), and the

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[4] The main elements of these shared taxes are the revenues from the federal income tax, the value-added tax and the ordinary fees from oil.

[5] According to Couchene, Diaz-Cayeros and Webb (2000), this 45.17 percent is allocated on a historical basis, starting with the states' own revenues just before the system started in 1980 and modified gradually by relative state tax effort" (p. 208). This historical allocation has benefited major oil-producing states, such as Tabasco and Campeche.

[6] Ward and Rodriguez (1999) show that in 1995 only 12 states had a formal Fiscal Coordination Law regulating transfers to their municipalities.

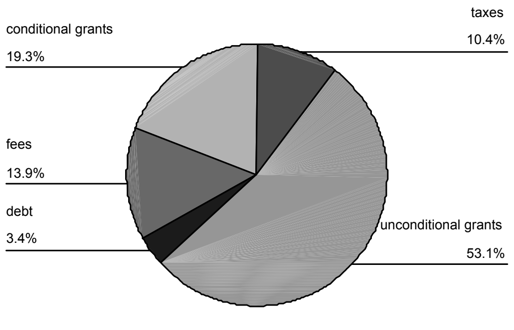
Fondo de Aportaciones para el Fortalecimiento de los Municipios y el Distrito Federal (Support Fund for Strengthening of Municipalities and the Federal District, FAFM)[7]. The FAISM is allocated from the federal government to the states using a formula based on poverty levels and other factors. States are required to transfer the FAISM to their municipalities based on similar criteria. Municipal governments can spend this money only to finance a set of projects related to basic social infrastructure. The FAFM is also an earmarked fund transferred to municipalities to strengthen public security programs and pay debt obligations.

Structure and recent evolution of municipal finances

Municipal governments in Mexico are heavily dependent on federal aid. Chart I, presents the structure of municipal finances in 1999, once the federal government had already launched the new earmarked transfers. Unconditional (revenue-sharing) grants represent 53.1% of total municipal revenues, followed by conditional or earmarked transfers, which account for 19.3% of revenues. Own-source taxes —being the local property tax the most important— represent only 10.4% of total revenues, or 0.21 % of the GNP (Raich Portman, 2001). This share is considerably below international standards.

Chart I

Structure of local finances in 1999



Source: Based on data from INEGI

Although local governments have always been highly dependent on federal aid, their tax revenues were increasing during the first half on the last decade.

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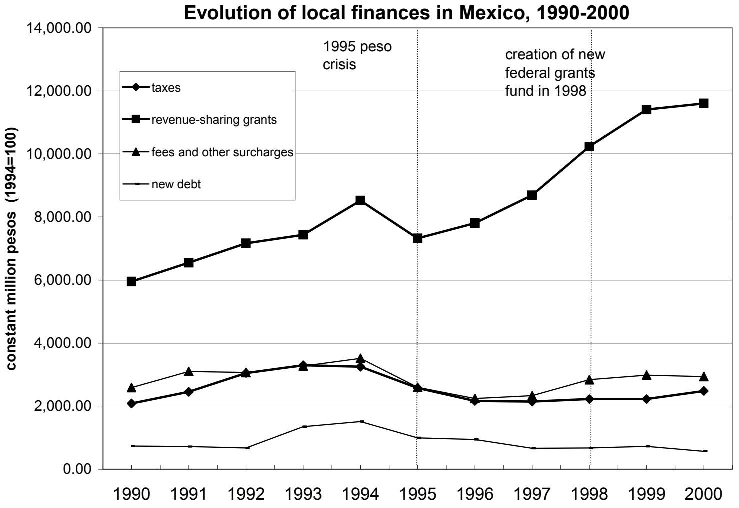
[7] Most of the resources of the FAISM came from a previous federal budget item created by the Zedillo government for poverty alleviation, the Municipal Social Infrastructure Fund. Peredo (2000) presents a good description of the earmarked funds transferred to states and local governments in Mexico during the nineties

Chart II shows the evolution of municipal finances in the last eleven years. As it has been already shown by previous studies (Cabrero, 2000), local governments' own tax revenues grew steadily during the 1989-1994 period, but with a dramatic decrease in the next years. This reduction might have been the result of the economic crisis of 1995, however federal grants did not suffer as much. It is interesting to note that, although the national economy recovered rapidly after 1995, local tax revenues did not. Still local fees improved after the crisis; they did not only recover their upward trend, but even surpassed local taxes. A possible explanation for this outcome is that the economic crisis of 1995 imposed a severe damage on local finances, and municipal governments did not want to inflict further fiscal pressures on their constituents, since that would have created high political costs. This relaxation in local fiscal discipline was possibly intensified by the creation in 1998 of the new federal earmarked funds transferred to local governments. The next section explores this last proposition with more detail.

Chart II
Evolution of local finances in Mexico, 1990-2000



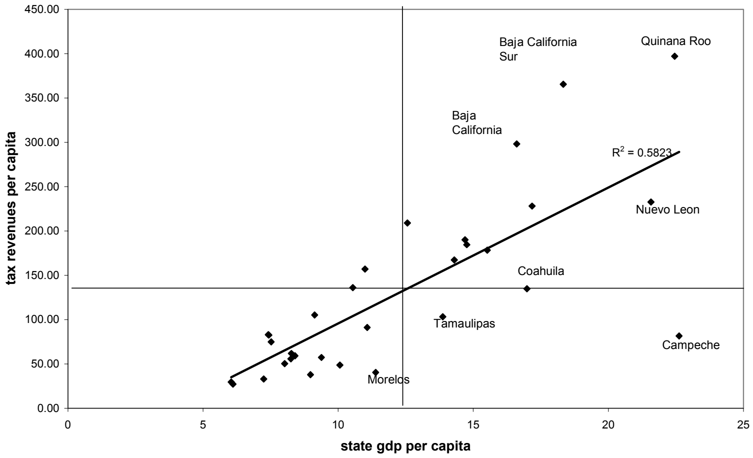
Source: Based on data from INEGI

Comentario: ACTUALIZAR HASTA EL 2000

Another important feature of Mexican local finances is the marked heterogeneity across municipal governments. Table I displays the average local tax revenue per capita during the 1990-1995 period, classified by states. The disparities are huge. For example, local governments in Chiapas collect on average $27 pesos per capita in tax revenues, while local governments in Quintana Roo collect almost $400. Clearly, these differences are explained to a great extent by the size of the economy in each region, as well as by the population density, but regional economic wealth does not account for the whole variations, as can be seen by comparing local revenues in states with a similar GDP per capita (see Chart III). Quintana Roo and Campeche, for example, have both equivalent economic and population sizes, but the former generates tax revenues more than three standard deviations larger than the latter. Local governments of Campeche and Tamaulipas, on the other hand, collect roughly similar revenues per capita, although the GDP per capita in the former almost doubles the latter. In summary, there are enormous differences across Mexican local governments in their capacity to collect revenues, as Table 1 shows in its last column, where such capacity is measured as total revenues per GDP. One of the purposes of this research is to find out the factors that explain these large differences. Given the prevailing fiscal arrangement described in the previous section, where local expenditure obligations are met significantly through federal grants, it is fairly possible that local politicians are unwilling to increase tax burdens to their constituents.

CHART III

Relationship between local tax revenues and state gdp per capita



Source: Based on data from INEGI

TABLE I

Local Tax Revenues and Regional gdp in Mexico (by state)

	Population in 1995 (thousands)	gdp in 1996 (pesos per capita)	Mean Revenues per capita 1990-1995 (1994=100)	Mean Revenues as a percentage of state gdp, 1990-1995
AGUASCALIENTES	863	15,000	190.00	1.27%
BAJA CALIFORNIA	2,112	17,000	298.09	1.75%
BAJA CALIFORNIA SUR	375	18,000	365.49	2.03%
CAMPECHE	643	23,000	81.62	0.35%
COAHUILA DE ZARAGOZA	2,174	17,000	134.77	0.79%
COLIMA	488	14,000	167.45	1.20%
CHIAPAS	3,585	6,000	27.17	0.45%
CHIHUAHUA	2,794	17,000	228.10	1.34%
DURANGO	1,432	11,000	91.17	0.83%
GUANAJUATO	4,407	9,000	105.29	1.17%
GUERRERO	2,917	7,000	82.60	1.18%
HIDALGO	2,112	8,000	61.88	0.77%
JALISCO	5,991	13,000	208.98	1.61%
ESTADO DE MEXICO	11,708	11,000	136.16	1.24%
MICHOACAN	3,871	8,000	74.95	0.94%
MORELOS	1,443	11,000	40.41	0.37%
NAYARIT	897	8,000	50.34	0.63%
NUEVO LEON	3,550	22,000	232.60	1.06%
OAXACA	3,229	6,000	29.63	0.49%
PUEBLA	4,624	8,000	59.25	0.74%
QUERETARO	1,250	15,000	184.51	1.23%
QUINTANA ROO	704	22,000	396.99	1.80%
SAN LUIS POTOSI	2,201	9,000	57.36	0.64%
SINALOA	2,426	11,000	156.99	1.43%
SONORA	2,086	16,000	178.41	1.12%
TABASCO	1,749	9,000	37.89	0.42%
TAMAULIPAS	2,527	14,000	103.32	0.74%
TLAXCALA	884	7,000	33.09	0.47%
VERACRUZ	6,737	8,000	55.63	0.70%
YUCATAN	1,557	10,000	48.79	0.49%
ZACATECAS	1,336	7,000	83.03	1.19%
MEAN	**2,667**	**12,000**	**129.10**	**0.98%**
STANDARD DEVIATION	**2,292**	**5,000**	**97.48**	**0.45%**
MIN	**375**	**6,000**	**27.17**	**0.35%**
MAX	**11,708**	**23,000**	**396.99**	**2.03%**

Source: National Institute of Statistics, Geography, and Informatics (INEGI), *Finanzas Publicas Estatales y Municipales*, various numbers

Estimating the effects of federal transfers

This section presents three regression models to estimate the effects of federal transfers on local tax revenues in Mexico. The first model (Model 1) tries to explain variations in tax revenues across municipalities in 1999, once the policy change (i.e. the creation of new earmarked funds transferred to municipalities) had already taken place. It is estimated on the basis of cross-sectional data from 2103 municipalities (virtually all Mexican municipalities, excluding those for which complete data are not available). However, given the marked heterogeneity that characterizes local governments of Mexico, the estimation was also performed on the basis of information from municipalities with at least 50,000 inhabitants. The model incorporates both revenue-sharing and earmarked grants from the federal government. Its specification is shown in Table II. Variables are expressed in logarithmic form in order to estimate elasticities (i.e. the percentage change in tax revenues as each explanatory variable changes by one percent). This method obviously dropped out observations taking values equal to zero. The second model (Model 2) tries to capture the effect of the policy intervention (i.e. the creation of the new conditional fund) on the tax revenues of municipalities. It is important to mention that there are not enough years for which municipal-level data are available, particularly for variables measuring local wealth or economic activity[8]. This limitation prevents us to adopt an approach combining time-series with municipal cross-sectional data, which would be ideal for analyzing structural changes over time without missing cross-sectional information. As an alternative, Model 2 aggregates the information of municipalities at the state level, which provides a panel of data from 31 states during a period of eight years (1993-2000). One advantage of this method is that it allows us to incorporate the GDP of states as an important control variable that is not available for Mexican municipalities. Certainly, this method has some drawbacks, especially the possible emergence of aggregation biases[9]. Its specification is given in Table III. Finally, the third model (Model 3) provides an alternative definition of the concept of "tax effort": rather than explaining variations in tax revenues at a single point in time, it tries to find out what variables influence the change in tax revenues between two different time periods. Its specification is displayed in Table IV. Tables V through VII display the regression results of the three models, all of which were estimated using ordinary least squares. The data was obtained from a variety of official sources, all of which are reported in Table A.4 in the Appendix.

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[8] The only two sources of municipal-level economic data are the economic censuses conducted in 1994 and 1999.

[9] Aggregation bias or ecological fallacies have been a common methodological problem in social science research. An excellent exposition of the problem and an important contribution to its solution can be found in King (1997).

TABLE II

Model 1

Dependent variable: **Natural logarithm of own-source tax revenues per capita in 1999**

Explanatory variables (all stated in natural log form, except for dummies)	**Justification**
Revenue-sharing grants per capita	These are the two key variables of the study. If the fiscal substitution hypothesis is true, we should expect their parameters to be negative.
Total conditional grants per capita	
Population density	It measures the relative cost of tax collection enforcement. As population density increases, the cost of raising additional taxes decreases as a result of economies of scale.
Employed population	Its parameter is expected to be positive, since a more intense local economic activity would increase the tax base. Since conditional transfers are allocated according to local socioeconomic conditions (grants are higher for poorer municipalities), employed population also allows us to control for this effect.
People employed in the agricultural sector	Indicates local economic structure. Negative expected sign, since rural communities have small tax bases. Also controls for local socioeconomic conditions.
Households without access to drainage	Both are indicators of relative local deprivation. They also measure relative expenditure need in each locality.
Households without access to water	
Wages generated by the industrial sector	Since no data exist on GDP at the municipal level in Mexico, I used the total industry wages as a proxy. This variable is fundamental to control for local wealth.
A set of variables measuring the administrative capacity of local governments in general	In all cases a positive sign is expected, since governments with higher administrative capacity collect more taxes.
State effects	A dummy variable indicating whether a municipality belongs to a specific state is added in order to examine if there are significant differences across states in the fiscal effort of their municipal governments. In other words, states might have certain characteristics influencing local tax efforts.

TABLE III

MODEL 2 (PANEL DATA)

DEPENDENT VARIABLE: MUNICIPAL TAX REVENUES PER CAPITA, AGGREGATED BY STATES FROM 1993 TO 2000

EXPLANATORY VARIABLES	JUSTIFICATION
CREATION OF CONDITIONAL TRANSFER FUND RAMO 33	A DUMMY VARIABLE TAKING A VALUE EQUAL TO ONE FOR ALL YEARS SINCE 1998 (THE YEAR IN WHICH THE NEW TRANSFER FUND WAS CREATED), AND EQUAL TO ZERO FOR ALL THE PREVIOUS YEARS.
REVENUE-SHARING GRANTS PER CAPITA	TO TEST THE FISCAL SUBSTITUTION HYPOTHESES IN THE CASE OF UNCONDITIONAL RESOURCES.
STATE GDP PER CAPITA	TO CONTROL FOR WEALTH.

TABLE IV

MODEL 2

DEPENDENT VARIABLE: CHANGE IN OWN-SOURCE TAX REVENUES PER CAPITA FROM 1998 TO 1999

EXPLANATORY VARIABLES	JUSTIFICATION
CHANGE IN REVENUE-SHARING GRANTS PER CAPITA, FROM 1998 TO 1999	AGAIN, MY TWO KEY VARIABLES ARE EXPECTED TO AFFECT NEGATIVELY THE GROWTH OF TAX REVENUES BETWEEN THESE TWO PERIODS OF TIME, BASED ON THE FISCAL SUBSTITUTION HYPOTHESIS.
CHANGE IN TOTAL CONDITIONAL GRANTS PER CAPITA, FROM 1998 TO 1999	
TOTAL POPULATION IN 2000	UNFORTUNATELY, NO ANNUAL DATA EXIST AT THE MUNICIPAL LEVEL FOR THESE THREE VARIABLES. HOWEVER, CONTROLLING FOR THE LEVEL OF THESE VARIABLES AT ONE POINT IN TIME IS IMPORTANT. NO EXPECTATIONS ARE MADE FOR THEIR COEFFICIENTS.
EMPLOYED POPULATION IN 2000	
PEOPLE EMPLOYED IN THE AGRICULTURAL SECTOR IN 2000	
LAGGED CHANGE IN TAXES PER CAPITA (1997-1998)	EVEN THOUGH THERE IS NO STRONG THEORETICAL JUSTIFICATION TO INCLUDE THIS VARIABLE, I DO IT IN ORDER TO EXAMINE IF PAST TRENDS CONTINUE IN SUBSEQUENT YEARS.
STATE EFFECTS	

TABLE V

REGRESSION RESULTS FROM MODEL 1

Dependent variable: Natural logarithm of tax revenues per capita in 1999.	All municipalities included R^2 = 0.602 Adjusted R^2 = 0.597 F= 68.97 Sig. = 0.000 N = 2103				Including municipalities with a population of at least 50,000 R^2 = 0.741 Adjusted R^2 = 0.698 F = 17.378 Sig. = 0.000 N = 326			
Independent variables (all in natural logarithmic form, except for dummies)	B	Std. Error	t	Sig.	B	Std. Error	t	Sig.
(Constant)	1.643	0.830	1.980	0.048	5.117	1.506	3.399	0.001
Revenue-share grants per capita	**0.510**	**0.050**	**10.239**	**0.000**	**0.336**	**0.083**	**4.048**	**0.000**
Total conditional grants per capita	**-0.884**	**0.121**	**-7.299**	**0.000**	**-1.216**	**0.246**	**-4.946**	**0.000**
People employed in agriculture	-0.191	0.044	-4.349	0.000	-0.152	0.064	-2.390	0.018
Population density	-0.145	0.028	-5.240	0.000	-0.161	0.051	-3.183	0.002
Households without drainage	-0.086	0.046	-1.872	0.061	-0.190	0.075	-2.529	0.012
Households without water	-0.011	0.031	-0.366	0.714	0.011	0.069	0.161	0.873
Employed population	0.108	0.054	1.998	0.046	0.181	0.095	1.909	0.057
Wages generated by the industrial sector per capita	0.128	0.013	9.642	0.000	0.049	0.025	1.999	0.047
Has a planning and finance department?	0.021	0.049	0.422	0.673	0.038	0.080	0.482	0.630
Is equipment adequate?	0.042	0.046	0.898	0.369	0.191	0.073	2.611	0.010
Number of public employees	0.000	0.000	0.496	0.620	0.000	0.000	0.910	0.364
Computers per employee	0.200	0.152	1.319	0.187	-0.098	0.958	-0.102	0.919
Is property register updated?	0.102	0.060	1.694	0.090	-0.116	0.101	-1.154	0.250
number of rules updated	0.011	0.009	1.182	0.237	0.010	0.015	0.685	0.494
number of public services regulated by a code	0.003	0.008	0.336	0.737	-0.009	0.012	-0.767	0.444
Is property tax rate updated?	0.135	0.052	2.605	0.009	0.004	0.079	0.050	0.960
State effects not displayed in this table, but jointly significant. F=23.07 and Sig. = 0.0000								
Variables measuring governmental capacity are jointly significant. F=6.65 and Sig. = 0.0000								

TABLE VI

REGRESSION RESULTS FROM MODEL 2

Dependent variable: Municipal tax revenues per capita, aggregated by states from 1993 to 2000	Municipal data aggregated at the state-level, for the 1993-2000 period R^2 = 0.485 Adjusted R^2 = 0.479 F= 76.71 Sig. = 0.000 N = 248 (31 states, eight years) Durbin-Watson statistic = 1.946 (no evidence of first-order autocorrelation)			
	B	Std. Error	t	Sig.
(Constant)	-3.194	3.614	-0.8839	0.377
Rev-share grants per capita	-0.0777	0.028	-2.78928	0.005
State GDP per capita	0.0000035	0.0000002	14.47899	0.000
Creation of conditional transfer fund (Ramo 33) in 1998	-6.606	2.792	-2.36577	0.018

TABLE VII

REGRESSION RESULTS FROM MODEL 3

Dependent variable: Change in tax revenues per capita from 1998 to 1999	R^2 = 0.236105 Adjusted R^2 = 0.223717 F = 19.05994 Sig. = 0 N = 2256			
	B	Std. Error	t	Sig.
(Constant)	12.17774715	19.71741	0.617614	0.536893
Change in rev-sharing grants per capita, 1998-99	0.007817358	0.002955	2.645641	0.008211
Change in conditional grants per capita, 1998-99	-0.042083964	0.031926	-1.31819	0.187577
Population	1.16552E-06	2.18E-06	0.534854	0.592804
Percentage of employed population	-12.30854441	19.6604	-0.62606	0.531341
Percentage of people employed in agriculture	1.359020982	1.365981	0.994905	0.319891
Lagged change in taxes per capita (1997-98)	-0.390258133	0.017627	-22.14	4.65E-23
State effects not displayed in this table, but jointly significant				

The results obtained from the first model are quite interesting. The first finding is that revenue-sharing grants —contrary to the fiscal substitution hypothesis— do not reduce tax revenues. Actually, it seems to encourage tax effort, since the sign of the coefficient is positive. However, tax revenues are not very sensitive to changes in revenue-sharing grants: a one percent increase in these transfers produces only an increase of 0.51% in tax revenues per capita. When the analysis is applied exclusively to urban municipalities (defined here as localities with a population of at least 50,000), the effect of revenue-sharing grants is even lower (0.33%). The explanation to this outcome might be that the level of taxes collected by local government stimulates the amount of revenue-sharing grants municipalities get. In other words, that the direction of causality is the opposite. From what we saw in the description of the Mexican revenue-sharing system, 45.17% of funds are allocated to states according to their effort in collecting certain taxes, but these taxes do not include the property tax (the most important local tax in Mexico). Furthermore, this stipulation holds only for the distribution of revenue-sharing transfers from the federal government to the states, but not from states to municipalities. Actually, the federal law does not specify that states should apply the tax effort criterion to distribute the grants to their local governments. Therefore, it is unclear whether Model 1 should be estimated taking into account the potential endogeneity between taxes and revenue-sharing grants. Further research is needed to elucidate this issue.

The second interesting finding from Model 1 is that conditional grants have a negative impact on local tax revenues. The effect is statistically significant, and its magnitude is not trivial: own-source tax revenues decrease by 0.88 percent by each additional one percent increase in conditional grants per capita. When focusing only on urban municipalities, the negative effect is even larger (1.2%). This finding supports the fiscal substitution hypothesis: the larger the earmarked transfer received by a local government, the lower its tax effort. Since earmarked transfers to local governments are not distributed according to any tax effort consideration, we can rule out the possibility of an endogenous relationship between these transfers and tax revenues. Moreover, the model mitigates possible bias emerging from the exclusion of local socioeconomic conditions by incorporating control variables such as employment levels, access to basis services, and local economic structure[10].

As expected, employment has a positive effect on taxes, while the percent of people working in agriculture, population density, and people's lack of access to basic services have a negative influence. Among the set of variables measuring administrative capacity, it is interesting to note that the only variable statistically significant at the usual level is whether the property tax rate was updated or not in 1995. Municipal governments with updated tax rates collect on average 0.14 percent more than those without updated rates. The remaining coefficients are positive (as expected) but not significant. Their low impact might be due to the fact that the data come from a public administration census carried out in 1995, thus it is very possible that the figures are somewhat obsolete. But the fact that administrative capacity variables are jointly significant suggests that the modernization of local public administration matters for tax revenue collection. Finally, state effects turned out to be jointly significant, implying that the states have specific characteristics that influence the ability of their local governments to collect tax revenues.

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[10] If such socioeconomic variables were excluded from the model, the negative relationship found between taxes and conditional grants might be spurious, since conditional grants are distributed according to the level of socioeconomic deprivation of municipalities. In other words, the negative effect on taxes could be explained entirely by the indirect effect of socioeconomic determinants, rather than by the grants per se.

The major finding from Model 2 is that since the new earmarked fund was created, Mexican municipalities have significantly decreased their tax revenues: as of 1998, local governments cut their tax revenues per person in $6.6 pesos on average, as compared to what they had been collecting per person during the previous five-year period. Even though the policy is too recent to allow us detecting a clear-cut structural change on local tax effort, this result is consistent with the findings from Model 1, thus providing additional empirical evidence of the fiscal substitution hypothesis. A surprising finding, on the other hand, is that unconditional revenue-sharing transfers appear to have also a negative effect on tax revenues, contrary to what we found in Model 1. One should be very cautious in deriving the conclusion that revenue-sharing transfers discourage local tax effort, since this result might come from a potential aggregation bias. Further research is needed to elucidate this issue.

Model 3 has less explanatory power than the two previous models, given its relatively low R^2. It predicts that an increase in revenue-sharing grants between two years generates an increase in tax revenues, while an increase in conditional grants decrease them. The first effect is statistically significant, but the second is not. The effects are not very large in both cases.

Conclusions and policy implications

The main findings of this research tend to support the hypothesis that the conditional grants launched by the federal government of Mexico in 1998 have discouraged local tax effort. A plausible explanation of this outcome is that local policymakers are reluctant to bear the political (and organizational) costs of enforcing local taxes more decisively, when they can take advantage of federal resources at virtually no cost. On the other hand, it seems that revenue-sharing transfers are not dampening down such fiscal effort. What might explain the divergent effects of these two types of intergovernmental transfers? One possible answer is that the states tend to reward local tax effort when distributing federal revenue-sharing grants to their municipalities, in the same way as the federal government compensates to a certain extent the relative tax effort of the states. Another likely explanation is that the way a transfer is designed affects the behavior of the recipient governments differently. In other words, that the degree of conditionality of a transfer fund affects the response of a lower unit of government: when local governments have more decision-making autonomy over a resource (such as unconditional revenue-sharing grants), they might put more effort in collecting taxes from their own sources; in contrasts, when a transfer imposes too many conditions on the way it can be spent (such as the *Ramo 33*), local governments might be discouraged from raising extra funds. Further research is required to better explain this issue.

In any case, the negative impacts of conditional grants on tax revenues is just another piece of evidence about the failure of the overall Mexican intergovernmental fiscal system to stimulate the fiscal capacity of local and subnational levels of government. As Diaz-Cayeros (2002) points out, one of the main problems of fiscal decentralization in Mexico is the absence of effective mechanisms to hold subnational governments accountable for their results. The unwillingness of local governments to enforce tax collection is a clear example of this problem.

The implications for public policy are complex. The extraordinary heterogeneity of municipalities in Mexico makes unfeasible to apply uniform solutions. Many local governments are totally unable to improve their tax efforts, simply because their geographical, economic and social characteristics limit their capacity to do so. These disadvantaged localities —more than 80% of all municipalities in Mexico— will continue to rely by and large on the aid from the federal and state governments for some years. On the other hand, there are several urban municipalities characterized by rising economies, more educational and labor opportunities, and an increasing political diversity. These communities have developed modern governance structures, and thus they are more capable to reduce their dependence with respect to federal resources.

However, as the analysis revealed, these urban municipalities react in a similar way to the influences of federal grants: revenue-sharing grants do not stimulate their taxes very much, and earmarked transfers discourage them to a great extent.

Currently, an intense debate is taking place in Mexico, calling for a redesign in the fiscal federalist arrangement. One of the stances within that debate is that the federal government should increase the share of funds transferred to states and municipalities. In my view, any further devolution of resources should be tied in with a clear definition of responsibilities, in such a way that subnational and local governments can still be held accountable for their fiscal performance. In particular, the design of earmarked transfers should prevent fiscal substitution. One possible alternative might be requiring local governments —particularly those with higher capacity— to match the federal aid with own-source funds. Obviously, this option would leave out the majority of small Mexican municipalities who lack the fiscal capacity to supplement the federal aid. Another option is to compel local governments not to reduce their own financial effort in the provision of municipal public services. An interesting proposal suggested by Cabrero and Martinez-Vazques (2000) is for the federal government to create special funds through which state governments compete, winning resources for strengthening the fiscal and administrative capacities of their municipalities.

An additional implication from this paper is related to the potential disadvantages of earmarking in the design of intergovernmental transfers. As the analysis has suggested, unconditional transfers do not discourage local tax effort, while conditional transfers do. In that case, the federal government should increase lump-sum grants, and reduce its degree of earmarking in the funds transferred to lower levels of government. If the federal government wishes to promote national policy goals in the provision of local public goods, it should use other type of mechanisms that do not distort local behavior. For example, instead of controlling *ex ante* the inputs or technology a local government can use in providing a basic public service, the federal government could adopt a results-oriented approach where the local government is evaluated according to the extent it accomplishes certain policy goals

Further research is required to improve our understanding on local fiscal performance. One of the principal limitations of this study was the lack of data to develop a better measure of fiscal capacity. A more precise indicator might be the ratio of actual revenues collected by a local government with respect to its total tax capacity. However, the lack of systematized information on tax bases and rates (for example property values) makes difficult to calculate such indicator. This information should be gathered in future studies on municipal fiscal performance. Another issue that deserves additional exploration is a more detailed description of the financial decision-making process in states and localities. De states take into account local tax efforts for the distribution of revenue-sharing grants to their municipalities? What other factors do local policymakers consider in their taxing and expenditure decisions? This type of information would certainly improve the specification of analytical models trying to explain the performance of local governments.

References

Arellano, Rogelio, comp. (1996), *México: hacia un Nuevo federalismo fiscal*, México, Fondo de Cultura Económica.

Cabrero, Enrique and J. Martinez-Vazquez, "Spending Responsibilities and Service Delivery", in Giugale, Marcelo M. and S. Webb, eds.. *Achievements and Challenges of Fiscal Decentralization. Lessons from Mexico*, Washington DC, The World Bank, pp. 139-176.

Cabrero, Enrique and I. Orihuela (2000), "Expansión financiera y gestión hacendaria en municipios de México", México, CIDE-Administración Publica, Documento de Trabajo # 87.

Courchene, Thomas and Alberto Diaz-Cayeros (2000), "Transfers and the Nature of the Mexican Federation", in Giugale, Marcelo M. and S. Webb, eds.. *Achievements and Challenges of Fiscal Decentralization. Lessons from Mexico*, Washington DC, The World Bank, pp. 200-236.

Courchene, Thomas, A. Diaz-Cayeros and S. Webb (2000), "Historical Forces: Geographical and Political", in Giugale, Marcelo M. and S. Webb, eds.. *Achievements and Challenges of Fiscal Decentralization. Lessons from Mexico*, Washington DC, The World Bank, pp. 123-138.

Alberto Diaz Cayeros, *et al.* (2002), "Mexico's Decentralization at a Cross-Roads", Center for Research on Economic Development and Policy Reform, Working Paper No. 153.

Hernández, Fausto (1997), "Es disciplinado el mercado crediticio estatal mexicano?", *El Trimestre Económico*, pp. 199-219.

Ibarra, Jorge, A. Sandoval, and L. Sotres (2001), "Participaciones federales y dependencia de los gobiernos municipales en México. 1975-1995", *Investigación Económica*, vol. LXI, num. 237, pp. 25-62.

INEGI, *Finanzas publicas estatales y municipales*, various numbers.

King, Gary (1997). *A Solution to the Ecological Inference Problem*, Princeton: Princeton University Press.

México (1998) *Ley de Coordinación Fiscal*.

Litvack, Jennie, *et al.* (1998), *Rethinking Decentralization in Developing Countries*, Washington, D.C., The World Bank.

Nordhaus, W. (1975), "The Political Business Cycles", *Review of Economic Studies*, 104, 325-346.

Peredo, Alberto (2001), "Fiscal Decentralization in Mexico under Zedillo (1994-2000): Devolution vs. Deconcentration. Preliminary Findigs", Paper prepared for delivery at the 2001 meeting of the Latin American Studies Association, Washington, DC, September 2001.

Prud'homme, Remy (1995), "On the Dangers of Decentralization", *The World Bank Research Observer* 10(2).

Raich, Uri (2001), "Impacts of Expenditure Decentralization on Mexican Local Governments", CIDE, Division de Administracion Publica, DT 102.

Rojas, Mariano (2000), "Political Contestability and Economic Performance in Mexican Municipalities, 1989-1995" in Lloyd-Reason and S. Wall Lester (eds), *Dimensions of Competitiveness*, Edward Elagar Publishing.

Sempere, Jaime and H. Sobarzo, comps. (1998), *Federalismo fiscal en México*, México, El Colegio de México.

Tanzi, Vito (1995), "Fiscal Federalism and Decentralization: A Review of Some Efficiency and Macroeconomic Aspects", in *World Bank Annual Conference on Development Economics*, Washington, D.C

Velazquez, Cesar (1999), "State Fiscal Deficits in Mexico: A Political Economy Explanation", unpublished paper.

Ward, Peter M. and V. Rodriguez (1999), *New Fiscal Federalism and State Government in Mexico*, U.S.-Mexican Policy Report No. 9, Lyndon B. Johnson School of Public Affairs, The University of Texas at Austin.

APPENDIX

TABLE A.1

Mean and Standard Deviation of municipal financial variables by year (all in constant 1994 pesos)

	Taxes		Revenue sharing grants		New debt		Fees		Expenditures		FAISM		FAFM	
	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
1990	985,183	5,471,886	2,527,261	8,919,060	750,018	3,372,098	1,441,296	6,947,994	5,370,902	22,118,260	N/A	N/A	N/A	N/A
1991	1,169,209	6,384,172	2,775,592	9,868,657	738,885	2,625,177	1,683,793	8,175,908	5,376,305	23,126,350	N/A	N/A	N/A	N/A
1992	1,513,041	7,989,949	3,165,405	10,782,658	717,585	3,397,615	1,659,082	7,834,572	6,244,989	24,307,596	N/A	N/A	N/A	N/A
1993	1,367,216	7,789,330	3,083,607	10,240,563	558,908	3,514,917	1,357,378	7,453,012	6,157,210	26,124,247	N/A	N/A	N/A	N/A
1994	1,348,877	7,513,323	3,534,873	11,220,276	627,379	3,947,102	1,457,225	8,167,954	6,530,267	27,066,174	N/A	N/A	N/A	N/A
1995	1,149,715	6,259,886	3,261,747	10,449,432	442,517	3,521,993	1,156,556	5,584,170	5,728,492	21,469,792	N/A	N/A	N/A	N/A
1996	922,538	4,983,706	3,327,789	10,071,616	402,293	2,769,200	956,124	5,262,328	5,471,613	19,661,949	N/A	N/A	N/A	N/A
1997	949,028	5,010,185	3,841,452	11,255,072	291,617	2,297,430	1,031,552	5,298,298	5,988,483	20,822,826	N/A	N/A	N/A	N/A
1998	920,315	4,999,149	4,229,678	12,627,947	278,504	1,836,664	1,174,194	6,304,311	7,045,729	24,255,357	1,489,529	2,357,483	995,676	2,895,633
1999	920,353	4,917,325	4,712,139	14,342,288	298,537	2,214,724	1,232,837	6,918,833	8,644,060	29,521,714	1,712,320	2,651,396	1,832,175	5,327,511

TABLE A.2

Descriptive statistics for variables in Model 1

				Means and standard deviations when variables 1 through 9 are stated in natural logs	
	N	Mean	Std. Deviation	Mean	Std. Deviation
1. Tax revenues per capita in 1999	2417.000	9.804	18.785	1.456	1.529
2. Revenue-sharing grants per cap in 1999	2417.000	181.395	176.901	4.998	0.705
3. Total conditional grants per capita in 1999	2416.000	132.871	45.146	4.833	0.340
4. Percentage of people employed in agriculture in 2000	2423.000	0.440	0.240	-1.086	0.930
5. Percentage of employed population in 2000	2423.000	0.990	0.012	8.094	1.520
6. Population density	2402.000	177.273	782.771	3.764	1.553
7. Percentage of houses without drainage in 2000	2394.000	0.547	0.300	6.826	1.298
8. Percentage of houses without water in 2000	2394.000	0.249	0.220	5.849	1.692
9. Wages generated by the industrial sector	2424.000	464584	2723845	8.090	3.330
10. Has a planning and finance department?	2424.000	0.337	0.473		
11. Is equipment adequate?	2424.000	0.315	0.465		
12. Number of public employees	2424.000	262.428	3544.901		
13. Computers per employee	2424.000	0.017	0.130		
14. Is property register updated?	2424.000	0.274	0.446		
15. Number of rules updated	2424.000	5.510	3.773		
16. Number of public services regulated	2424.000	4.783	3.975		
17. Is property tax rate updated?	2424.000	0.721	0.449		

TABLE A. 3

DATA SOURCES FOR ALL VARIABLES

VARIABLE	DATA SOURCE
TAX REVENUES PER CAPITA	INSTITUTO NACIONAL DE ESTADÍSTICA, GEOGRAFÍA E INFORMÁTICA (INEGI), *FINANZAS PÚBLICAS ESTATALES Y MUNICIPALES*, 1999.
REVENUE-SHARING GRANTS PER CAPITA	INSTITUTO NACIONAL DE ESTADÍSTICA, GEOGRAFÍA E INFORMÁTICA (INEGI), *FINANZAS PÚBLICAS ESTATALES Y MUNICIPALES*, 1999.
TOTAL CONDITIONAL GRANTS PER CAPITA (FAIS AND FAFM)	SECRETARIA DE DESARROLLO SOCIAL
POPULATION DENSITY	INEGI, POPULATION CENSUS 2000
TOTAL POPULATION	INEGI, POPULATION CENSUS 2000
EMPLOYED POPULATION	INEGI, POPULATION CENSUS 2000
PEOPLE EMPLOYED IN THE AGRICULTURAL SECTOR	INEGI, POPULATION CENSUS 2000
HOUSEHOLDS WITHOUT ACCESS TO SEWAGE	INEGI, POPULATION CENSUS 2000
HOUSEHOLDS WITHOUT ACCESS TO WATER	INEGI, POPULATION CENSUS 2000
WAGES GENERATED BY THE INDUSTRIAL SECTOR	INEGI, ECONOMIC CENSUS 1999
HAS A PLANNING AND FINANCE DEPARTMENT?	CEDEMUN-INEGI, MUNICIPAL SURVEY, 1995
IS EQUIPMENT ADEQUATE?	CEDEMUN-INEGI, MUNICIPAL SURVEY, 1995
NUMBER OF PUBLIC EMPLOYEES	CEDEMUN-INEGI, MUNICIPAL SURVEY, 1995
COMPUTERS PER EMPLOYEE	CEDEMUN-INEGI, MUNICIPAL SURVEY, 1995
IS PROPERTY REGISTER UPDATED?	CEDEMUN-INEGI, MUNICIPAL SURVEY, 1995
NUMBER OF RULES UPDATED	CEDEMUN-INEGI, MUNICIPAL SURVEY, 1995
NUMBER OF PUBLIC SERVICES REGULATED	CEDEMUN-INEGI, MUNICIPAL SURVEY, 1995
IS PROPERTY TAX RATE UPDATED?	CEDEMUN-INEGI, MUNICIPAL SURVEY, 1995