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IMPACTS OF EXPENDITURE DECENTRALIZATION ON MEXICAN LOCAL GOVERNMENTS

Abstract

For the last two decades, Mexico has been decentralizing fiscal, political and administrative responsibilities to its subnational tiers of government. In 1997, when the opposition won the majority in the federal Congress, the fiscal decentralization process was strengthened by the creation of the Fund for Municipal Social Infrastructure (*FAISM*). Since then, municipalities in Mexico have been receiving more financial resources from the central government than ever before.

This paper analyzes the impacts that the creation of the *FAISM* has had on the tax effort of Mexican municipalities. Due to the lack of financial information at the municipal level, no study of this sort has examined the performance of Mexican municipalities, and very few studies have analyzed similar impacts in other developing countries. By drawing on original data of own-source revenue collection of the 217 municipalities on the State of Puebla, and by performing several calculations of descriptive statistics before and after the creation of the *FAISM*, this paper finds that the *FAISM* has negatively affected the tax effort of Mexican municipalities. This result is congruent with the 'rational' model of tax effort and with the prescription that the lack of proper institutions at the local level belies the good intentions of decentralization resulting in policy failure.

Resumen

En los últimos dos decenios en México ha habido un proceso de descentralización política, fiscal y administrativa hacia los gobiernos subnacionales. En 1997, cuando la oposición ganó la mayoría en el Congreso, este proceso comenzó un proceso de aceleramiento. Prueba de ello, es la creación a fines de ese año del Fondo de Aportaciones para la Infraestructura Social Municipal (FAISM), que desde entonces representa una muy importante fuente de ingresos para los municipios del país.

El presente documento de trabajo analiza el impacto que la creación del FAISM ha tenido en el esfuerzo fiscal de los municipios en México. Debido a la falta de información sobre las finanzas municipales en el país, a la fecha no se ha desarrollado ningún trabajo de esta naturaleza para el caso Mexicano. De igual forma, en la actualidad se cuenta con muy pocos estudios sobre el tema en otros países en desarrollo. Este documento analiza la recaudación de ingresos propios en los 217 municipios del Estado de Puebla antes y después de la creación del FASIM, y concluye que este fondo ha afectado adversamente el esfuerzo fiscal de los municipios en México. Este resultado además de ser congruente con el modelo 'racional' del esfuerzo fiscal, subraya que la falta de instituciones a nivel local no solo pone en riesgo las buenas intenciones del proceso de descentralización, sino que puede conducir a su fracaso.

> The art of taxation consist of plucking the goose so as
> to obtain the most feathers with the least hissing
> Jean-Baptiste Colbert (1619-83)

Introduction[*]

For the last two decades, central governments of developing countries around the world have been decentralizing fiscal, political and administrative responsibilities to their subnational governments. Currently, there is very little doubt that decentralization is a beneficial process that brings the economic and political systems closer to the people. Economically, decentralization closes the gap between the suppliers of public services and the local consumers, increasing efficiency and reducing costs. Politically, it enhances the autonomy, responsibility and accountability of subnational levels of government.

Aware of the alleged virtues of decentralization, Mexico has been following a decentralization policy since the constitutional reform of 1983. This movement toward decentralization has deepened since 1997, when the party in office lost control of the federal Congress (for the first time in history) and the opposition both in Congress and in various states and municipalities moved the issue of fiscal federalism to the forefront of Mexico's political agenda. At the end of 1997, Congress approved a reform to the National Law of Fiscal Coordination thereby creating a new intergovernmental transfer called Fund for Municipal Social Infrastructure (*FAISM*).

As a result of the creation of the *FAISM*, municipalities are receiving more financial resources to undertake infrastructure projects than ever before. However, members of academia, as well as government officials, have begun to raise questions about the impacts of the *FAISM* on municipal governments' capacities to mobilize local fiscal resources (SHCP 2000; Cabrero and Orihuela 2000). Particularly, they suspect that municipalities are reducing their tax effort, because municipalities prefer to rely on intergovernmental transfers rather than bear the costs of tax collection.[1] Despite this suspicion, no study has been performed to assess the impact of the *FAISM* on the tax effort of Mexican municipalities. In order to cope with the scarcity of studies on the matter, this paper seeks to analyze the impact that the *FAISM* has had in the tax effort of municipalities in Mexico. It will do so by comparing the collection of property taxes and water fees for all the 217

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[1] Like most studies of fiscal decentralization, this one will use the words 'transfers' and 'grants' interchangeably.

municipalities of one Mexican state, Puebla, before and after the introduction of the *FAISM* —from 1993 to 2000.

This paper analyzes the impact of the *FAISM* exclusively at the municipal level —not at the state level— of government, because although strong claims are made in favor of decentralization, there is virtually no empirical evidence about the impacts of fiscal decentralization on the tax effort of Mexican municipalities. One of the main causes of this lack of evidence is because data at the municipal level in Mexico, as in most developing countries, is either unavailable, of very poor quality, or extremely difficult to obtain.[2] Another more theoretical reason for the lack of studies is the complexity and ambiguity of the relationship between intergovernmental transfers and tax effort. Although it is quite common to find the term 'tax effort' in the literature on fiscal decentralization, academics have neither proposed a single definition of this term, nor a unified methodology to measure it. In order to partially solve this problem, in this paper I will use the term 'tax effort' to mean the own-source revenues (i.e. taxes and fess) that the municipal treasuries collect.

Despite the lack of a clear definition of tax effort, its relationship with intergovernmental transfers is a recurrent issue in the literature on fiscal decentralization. In the literature two main rival explanations of the impacts of transfers on the local tax effort stand out. The first one has its roots on the 'rational' assumption of the maximization of benefits over costs. According to this explanation, an increase in transfers will reduce local governments' tax efforts ('fiscal laziness') because 'rational' municipal officers will seek to avoid the political and administrative costs of tax collection. The second explanation, generally referred to as the 'flypaper effect', suggests that 'money sticks where it hits' (Hines and Thaler 1995). According to this explanation, tax collection is not reduced and transfers increase total expenditures by approximately the same amount of the transfers –because transfers are indeed used for the purpose that they are granted.

Empirical studies on the impacts of intergovernmental grants on tax effort usually support either the 'rational' or the 'flypaper' models. However, the evidence of studies on both developing and industrialized countries is far from being robust (Litvack *et al.* 1998: 7). One of the reasons of this situation is due to the scarcity of studies that seek to assess the impact of grants on tax effort. To the best of my knowledge, Colombia and the Philippines are about the only two developing countries that have been studied. Advanced countries such as the U.S., Canada and Germany have been given more attention. However, even in these cases, experts argue that results are not conclusive because a proper analysis requires both a formal

theoretical model of the expected local fiscal response to grants and a test of this model against an appropriate body of data (Bird and Slack 1983: 121; Bird 1984: 152; Gramlich in Oates 1977: 227).[3]

The results of this paper provide evidence in favor of the 'rational' model of tax effort. Different calculations of descriptive statistics show that after the introduction of the *FAISM*, municipalities in Mexico reduced their own-source revenue collection. The results, however, vary both by size and by the level of welfare of the municipalities. Due to the lack of data at the municipal level (i.e. property values, municipal GDP, etc.) no econometric calculations were performed. Despite this, the findings of this investigation provide a first step towards the understanding of both the impacts of grants on the tax effort of Mexican municipalities, and the policy implications of the last reform to the Law of Fiscal Coordination in 1997. This understanding is not a minor concern in a time when municipalities are increasingly becoming the driving forces of infrastructure and development in Mexico.

The paper has five sections. Section one, presents a literature review and the theoretical framework of fiscal decentralization. Section two, introduces the institutional context of fiscal decentralization in Mexico. Section three, deals with the methodology of the investigation. Section four, presents the results followed by a discussion of the findings. Finally, section five concludes.

1. Literature review and theoretical framework

This section presents a review of the theories of fiscal decentralization, with special attention to the relationship between the revenues that subnational governments raise by themselves and those that they receive from the upper tiers of government. This section also introduces the notion of vertical fiscal imbalance and analyzes the impacts of intergovernmental transfers on the local tax effort. A brief discussion of the results of other studies about the impacts of grants on local tax effort both in developed and developing countries is also presented.

1.1. Theories of fiscal decentralization

Political and economic virtues are often claimed for fiscal decentralization.[4] On political grounds, advocates of fiscal decentralization claim that it promotes attributes such as participation, responsiveness and accountability, by bringing the government closer to the people (Shah: 1998). These political virtues of decentralization are fully praised in the literature of fiscal decentralization; however,

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[3] Moreover, most of these studies focus on the analysis of state or middle tiers of government rather than on the municipal level.

[4] The literature on the virtues of fiscal decentralization is vast. For an excellent review on this topic see: W. Oates (1999).

most of the time these political claims assume that decentralization is an inherently valuable process. Bird and Villancourt clearly address this issue in the following uncommon way (1998: 4):

> local people may make wrong decisions from the perspective of the central government or of an outside observer, but if *they* make them, the decisions must, by definition, be assumed to be right for them. From this perspective, then, decentralization is intrinsically good because it institutionalizes the participation of those affected by local decisions. The results of a good process must themselves be good.

Like the political claims in favor of decentralization, the economic ones are also thoroughly praised in the literature. The most common economic rationale for decentralization is to attain allocative efficiency in the face of different local preferences for local public goods (Litvack *et al.* 1998: 5). This rationale was mainly developed by Tiebout (1956), Musgrave (1959) and Oates (1972). According to Musgrave, local governments should mainly be in charge of the allocation function, which is concerned on how resources should be used and what goods and services should be produced. Oates' 'decentralization theorem' claims that because local governments have better information than the central government about local preferences, they will more efficiently provide public goods (Oates 1972: 35). Finally, Tiebout's 'voting with the feet' model argues that consumer/voters in a spatial economy are forced to settle in one community rather than another, thereby automatically revealing their preferences for the mix of taxes and services. Thus, this model "provides a market-analogue solution to the provision of local collective goods" (Dowding in King and Stoker eds. 1996: 61).

An important prescription of both the economic and the political theories of fiscal decentralization is that in order to achieve autonomy, local governments must enlarge their tax base, rather than depend on transfers from higher tiers of government (IADB 1994; Jones and Stewart 1983; Travers 1986; Peterson 1997). According to the Council of Europe (1992: 10):

> The tax yield should cover the bulk of local budget requirements. If local autonomy is a political and economic goal, local authorities should, as far as possible, not be dependent on grants given by higher authorities for their specific tasks. Taxes administered by local authorities themselves give a more secure base for long term budgetary planning and autonomy, especially on the expenditure side.

This prescription has its source on the basic distinction between 'own revenues' and intergovernmental transfers. According to the theory of fiscal federalism, transfers should be delivered to local governments only after they have tried to raise their own revenues, if not, they could discourage the local tax effort because they will have less incentive to search for new sources of revenue or to more efficiently collect taxes from existing bases (Bahl and Linn 1992: 428). Even though local governments are usually not in charge of raising many taxes, it is essential that

municipalities raise a significant portion of their own revenues, because "if they do not, the whole rationale for improved economic efficiency and enhanced governance is in jeopardy" (IADB 1994: 180).

This traditional view of fiscal federalism holds that when revenue is raised by and transferred from other tiers of government, it blurs local responsibility and accountability. Brennan and Buchanan argue that "when the central government collects and administers taxes on behalf of the subordinate units, the effect is identical to explicit collusion on the part of these units. Local units should tax and spend independently" (1980: 185). Likewise, the Layfield Committee in Great Britain presented a report to Parliament in 1976 concluding that "the only way to sustain a vital local democracy is to enlarge the share of local taxation in total local revenue" (in Travers 1986: 68). Jones, Stuart and Travers summarized the argument of local taxation and accountability in the following statement (in Jones and Stuart 1983: 94):

> To achieve genuine local accountability the local government financial system should be recast to ensure that local authorities draw the buck of their income from their own local taxpayers and voters, and that the latter are aware that they are paying their taxes to support local government services.

1.2. Own-source revenues, transfers, and vertical imbalance

Despite the persuasive arguments in favor of decentralization, in practice, academics agree that "in virtually all decentralized systems, the policy responsibilities of lower levels of government are not fully financed by their own tax revenues" (Willis *et al.* 1999: 8). The root of this problem of vertical fiscal imbalance[5] lies in the limited taxing powers available to subnational governments and in the wide range of expenditure responsibilities that they have to face (Bird and Villancourt 1998: 8). For this reason, intergovernmental grants are not only inevitably required to close the fiscal gaps between local revenues and expenditures, but also represent the main source of revenue of subnational governments in most countries (Litvack *et al.* 1998: 12; Smoke 2001: 23; Spahn 1999: 14).[6]

Before discussing the characteristics of the intergovernmental grants, the paper will briefly present the main sources of local revenues. Generally, local

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[5] At the Local level, 'vertical fiscal imbalance' is measured in two ways: as expenditures less own-source revenues or alternatively, as expenditures less total revenues including intergovernmental grants. This paper uses the term according to its first connotation. When municipalities finance a large proportion of their budgets with their own-source revenues (not including grants) the vertical fiscal imbalance is small and vice versa.

[6] It is worth mentioning that despite the overall consensus in favor of intergovernmental grants, there is a current proposal in favor of strengthening the subnational government's tax regimes instead of increasing their financial reliance on intergovernmental transfers. For an interesting discussion of this progressive proposal see: R. Bird (1999).

governments in developing countries have two main sources of own revenues: the property tax and fees from the provision of services. The arguments in favor of the local administration of the property tax are varied, among the most notorious ones are: *1)* no difficulty it attributing the yield, *2)* the stability in the operation of the rating system, *3)* evasion is extremely difficult, *4)* the cost of maintaining the rating is low in proportion to the yield, *5)* the tax is relatively simple and understandable, and *6)* identifying the property to be taxed is fairly easy (Foster *et al.* 1980: 129; Peters 1991: 40). Despite these strengths, the property tax also has some severe economic and political limitations. One of the most common critiques of the property tax is its high visibility; the taxpayer usually has to pay the tax directly out of his taxable income, as opposed to other taxes which are deducted at the source (McCluskey 1991: 11). Another problem of this tax is the continuous reassessment of the property that do not only require a skilled staff to do it properly, but that is amongst the most corrupt of urban functions (Paul 1975: 7). For all these reasons, Bird and Slack argue that "it takes a good deal of sweat, tears and political blood to raise property taxes sufficiently to keep up with the pace of expenditure growth needed to maintain service levels" (1983: 15).

As for the fees received by local governments from their provision of public services, most of the literature on local public finance states that whenever possible, municipalities should employ user charges. The charge of fees for the provision of services does not only generate revenues to the local treasuries, but also introduces the dynamics of the market –via pricing– into the processes of the public sector. Economically, it is argued that the charge of fees promotes efficiency in consumption because it provides information to both the citizens and the government in such a way as they can make a better use of their resources. Moreover, it has also been argued that the charge of fees is more in accord with the economic principles of benefit and equity in the sense that people pay for what they consume. Despite all these virtues, very few countries employ user charges to the extent possible. This is mainly because it is surprisingly difficult to design and implement good user charges and because good charges are, almost by definition, not popular among administrators or citizens (Bird 1999: 12).

Due to the limitation of their local own-source revenues, municipalities extensively relay on intergovernmental grants.[7] The use of grants is generally justified on two grounds: economic and political-institutional reasons. The principal economic rationales are allocative efficiency and fiscal equity. On the one hand, allocative efficiency comes into the picture when interjurisdictional spillovers lead to the misallocation of resources and transfers are used to correct these externalities. On the other hand, fiscal equity is related to the assumption that jurisdictions should provide some 'average' level of public services by exerting an 'average' fiscal effort, usually measured as its tax rate. However for various reasons (different tax

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[7] The literature on intergovernmental grants is vast and it will not be fully addressed in this paper. However, for a very good review see, among many others: Gramlich in Oates 1977, Oates 1999 and Winkler 1994).

bases, different cost of providing public services or differences in the demands for public services) jurisdictions do not provide an 'average' level of public services; thus, grants are used to reduce these fiscal inequalities.

While grants are used, to various degrees, in most intergovernmental arrangements (federal and unitary alike) for closing the 'fiscal gaps', the use of grants also has some disadvantages. Grants can make local governments less accountable for their fiscal decisions, and they can adversely affect the tax effort of local governments. The rest of this section will address the first limitation and the following section will discuss the impacts of grants on tax effort.

The problem of accountability is an old one, that rises from "separating the pleasure of expenditure benefits from the pain of taxation" (Bahl and Schroeder in Bahl and Miller eds. 1983: 116). According to the accountability argument, governments will be more solicitous in spending their budgets, if they directly tax their citizens. Thus, the central question is how to keep local governments accountable? Traditionally, grants have been treated as potential threats to the accountability of local governments. Clearly, this conception of accountability favors the collection of own-source revenues over the provision of intergovernmental grants. However, recently authors such as Bird, McLure and Villancourt have developed a new concept coined "accountability *at the margin*" that proposes that in principle it is perfectly possible for a local government to be highly dependent on central transfers (i.e. 90 percent) and still be fully accountable to its citizens and/or to the central government. According to this concept of accountability at the margin, the complex question about the impacts of the different sources of revenues on local responsiveness could be disentangled by following this simple rule (Bird and Villancourt 1998: 13; Bird: 1999):

> *(1)* Subnational governments need to control their own revenues in order to facilitate effective decentralized control of spending, but that *(2)* control in this sense simply requires that they can affect the volume of own revenues significantly at the margin through their own policy choices, in particular, by choosing tax rates. That is, if subnational governments are expected to act responsively, such governments must be able to increase or decrease their revenues by means that make publicly responsible for the consequences of their actions.

1.3. Impact of intergovernmental transfers on local tax effort

Despite that the relationship between grants and tax effort has been a recurrent issue in the literature on fiscal decentralization, there is no consensus about the magnitude of the response of the tax effort to the impacts of intergovernmental transfers (Bird and Slack 1983: 112). In what follows, I will first explore the main explanations of the impacts of transfers on local tax effort, and after I will present the results of some studies that have been done about this issue in other countries.

According to the literature on public finance there are two rival theories to explain the impacts of transfers on local tax effort. The first one that I referred to as the 'rational model' argues that increased transfers result in a decline in local tax effort.[8] According to this model, transfers generate a disincentive effect because the local governments that 'tries the least gets the most'. This is simply because 'rational' governments prefer to rely on transfers, rather than to bear the costs of tax collection. The second model is generally referred as the 'flypaper effect' and it basically defends the idea that 'money sticks where it hits' (Hines and Thaler 1995). This is that transfers are indeed used for the purpose that they are granted. According to this model, local government spending is much more responsive to increases in intergovernmental receipts than it is to increases in the community's private income. Note that this last model "is not easy to reconcile with models of rational choice, for it suggest that the same budget constraint gives rise to different choices depending on what form the increment to the budget takes" (Oates 1999: 1129).

Although the 'rational' and the 'flypaper' models capture the two possible impacts of grants on local tax effort, their effects are not generally described in such a language. The studies of the economic impacts of intergovernmental transfers on developing countries usually estimate the effect of grants on local tax effort in terms of the 'stimulation' or the 'substitution' effects that the grants bring about. According to Bahl and Linn (1992: 459) the general approach seeks to estimate the per capita expenditure (E) responsiveness to per capita grants (G), usually from the following linear relationship: $E = a + b_iX_i + cG$, where X_i are the other variables affecting the level of expenditures. If in this relationship the coefficient of the per capita allocation of grant is greater than 1 ($c > 1$), this means that it increases the expenditure per capita in more than one unit, which is a stimulation effect. Conversely, if the coefficient of the per capita allocation is less than 1 ($c < 1$) then a substitution effect is taking place, because the expenditure per capita is increasing by less than one unit.

According to this terminology, the substitution effect causes local governments to reduce their tax effort because they "prefer 'free' central transfers to the politically costly course of raising own-source revenues" (Peterson 1997: 10). Similarly, Bahl and Schroeder argue that when a stimulation effect dominates, it is most probably because local governments have a backlog of unmeet public services needs that virtually guarantees that any increased amount of revenues available to local government will find its way into the local budget (in Bahl and Miller eds. 1983: 106). This stimulation effect –commonly referred as the 'flypaper effect'– implies that once a local government receives grant money, it is more likely to spend it than return it in tax relief. According to the 'flypaper effect' the particular ways in which local governments spend their resources do not only depend on the design of the grants themselves, but also on the source where the money is originated. Thus,

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[8] The proposal to use the term 'rational model' is mine; the literature does not have a systematic way to refer to this effect.

the 'flypaper effect' runs somehow contrary to the common argument raised by economists about the fungibility of money, in the sense that it assumes that the local government's spending decisions are bounded by the source of their revenues. Hines and Thaler (1995) argue that because of this lack of fungibility local governments treat differently the resources they have on hand (own-source revenues) and the resources that they can easily get (grants). As it can be expected, local governments are supposed to be more careful in the management of their own-source revenues than of the intergovernmental grants.[9]

Although the source of the local revenues seems to have an impact on local spending –as proposed by the 'flypaper effect'– it is more frequently argued that the extent to which the 'substitution' and 'stimulation' effects dominates, depends to a big extent on the characteristics (design and objectives) of the grants themselves. Due to the lack of space I will only discuss the effects of a non-matching, lump-sum grant on the tax effort. This type of grant matches the characteristic of the *FAISM*.[10] As it will become clear from the following graph, the ultimate impact of the grant on tax effort will depend on the elasticity of the demand. The usual theory is based on a model of government behavior that assumes that the recipient local governments maximize the utility of their citizens, subject to a budget constraint. The next graph shows how the introduction of the grant shifts the original budget line (GX) outward to the new budget line (G'X'). The curve does not change its slope because since this is a non-matching grant, there is only an income effect –not a substitution one.[11] At the pre-grant equilibrium (E1) the tax rate is X1X/0X. However, after the grant is given this rate may rise, fall or remain constant, depending to the income-elasticity of demand. At a unitary income-elasticity, equilibrium moves to E2 and the tax rate is X2X'/0X', which is equal to the pre-grant rate. At solution to the right of E2, such as E'2, the demand for public goods in income-elastic and tax effort will decrease.

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[9] The concept of 'fungibility' refers to the fact that having money on hand and being able to raise money without difficulty should have *no* impact in spending decisions.

[10] In the jargon of fiscal economists the *FAISM* can be accurately described as a close-ended, non-matching, conditional grant. The percentage of the total transfer that is received by any jurisdiction varies according to the values of the elements of the allocation formula; however, for all jurisdictions taken together, the grant is close ended because the Law of Fiscal Coordination (*LFC*) requires that the amount of the total transfer should be of 2.5 percent of the Federal Assignable Taxes. See section 2 of this paper.

[11] Note that because the introduction of grants into this model alters the budget constraint, different grants result in different movements of the budget line and consequently in different responses by municipalities.

Figure 1

The Effects of a Lump-Sum Grant on the Tax Effort
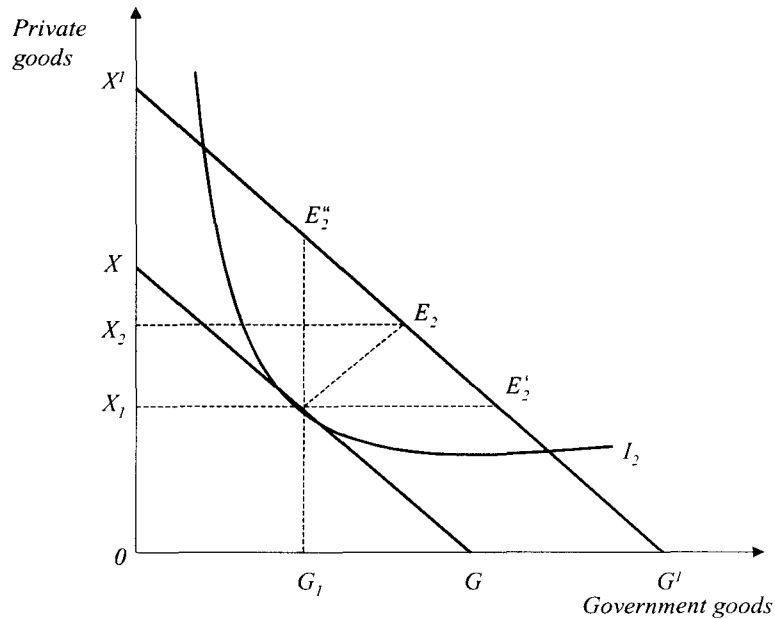
1.4. Empirical studies, main results and caveats

Because theory does not provide a clear answer of how to stimulate local governments to find ways to increase tax effort, one is left to search for an answer in the results of empirical research. However, Bahl and Linn argue that "unfortunately there is little to search. The results of a few econometric analyses do not turn up clear evidence of either stimulation or substitution in the effect of grants on public spending in developing countries" (1992: 459).

In general, two main ways of conducting empirical research have been carried out. When information has been available, econometric calculations have been performed to assess the impact of grants on tax effort. The majority of these studies have relied on evidence of cases in the United States, Canada and Germany (Von Hagen and Hepp 2000; Bird and Slack 1983), and have shown that a proper analysis requires both a formal theoretical model of the expected local fiscal response to grants and a test of this model against an appropriate body of data (Bird

and Slack 1983: 121; Bird 1984: 152; Gramlich in Oates ed. 1977: 227).[12] Because of the lack of data at the municipal level, very few studies of this sort have been done on developing countries. Instead, some calculations of descriptive statistics, such as a comparison of the evolution of own-source revenues to intergovernmental shares and transfers have been performed (Cabrero and Orihuela 2000; Annex III 1995).

The results of both the studies that perform econometric calculations and those that use descriptive statistics, are far from being robust (Bird 1984: 151; Annex III: 27). The results of the econometric analyses are sensitive both to the data and the models used and to the estimation technique and the countries chosen. In order to assess the impacts of transfers on local tax effort, in 1984 Richard Bird studied the two major transfer programs of Colombia and found a substitution effect. His results suggest that a strong association exists between the transfers and "the *decreased* local expenditures: that is, the recipient jurisdictions appear to have reduced their efforts to raise revenues as a result of receiving the transfer" (Bird 1984: 153). In 1983, Bahl and Schroeder studied the effects of transfers on the local tax effort of municipalities in the Philippines and did not find evidence of a reduction in local tax effort. Similarly, Dillinger statistical estimates provide no evidence that municipalities in the state of Sao Paulo reduced taxes in response to grants inflows (in Bahl and Linn 1992: 460).

Besides the econometric studies briefly presented, some other studies using descriptive statistics have been performed. To the best of my knowledge, in the Latin American context Colombia is the country that has been more concerned with the impacts of grants on local tax effort. A World Bank report called "Colombia: Making Decentralization Work: Incentives for an Effective Delivery of Services" and its "Annex III: Local Resource Mobilization in Colombia" presents a comprehensive analysis of the effects of fiscal transfers on tax effort in that country.[13] This report studied the evolution of the own-source revenues both in nominal, real, and per capita terms and as percentage of GDP and concluded that there is no evidence of fiscal 'laziness' in the Colombian local governments. The report found that in each of the four measurements, Colombian local governments expanded their own-source revenues during the period of study (1988-1994). Similarly, another paper of the World Bank (Garzon 1997) that classified Colombian municipalities by population size and by level of development found that from 1987 to 1995 taxes increased both in nominal and in real terms in virtually all groups of municipalities. This study concluded that it "cannot be argued that there has been a

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[12] The optimal data for these analyses are some sort of measures of the local tax bases, such as the taxable cadastral values on an equalized basis. However, regression analysis may also be performed using alternative information on variables such as: GDP per capita (for municipalities), urban population, population density, and employment as independent explanatory variables (Bird and Slack 1983: 121; Annex III 1995: 17).

[13] Ariel Fiszbein and Richard Bird wrote the report and Richard Bird and Tom Tsiopoulos prepared the annex.

drop in tax collection in general or for the revenue sources that may be the most sensitive to changes in tax effort" (Garzon 1997: 8).

In regard to the availability of studies about the impacts of transfers on the local tax effort of Mexican municipalities, despite that both members of the academia and the government have expressed a suspicion of 'fiscal laziness', very little analysis have been done. To the best of my knowledge, there is only one working paper by Cabrero and Orihuela that have advanced on this issue. They studied the evolution of municipal own-source revenues and revenue-shares from 1978 to 1997 and concluded that throughout this period the vertical imbalance of Mexican municipalities has been accentuated (2000: 17).

2. Mexico's fiscal federalism

Mexico's high fiscal centralism makes it a particularly useful case to study the impacts of grants on local tax effort.[14] Although the figures provided in the literature are not systematic, both academics and the government itself have recognized the high fiscal centralism of the Mexican federation. According to Courchene and Diaz-Cayeros, in 1999 Mexican municipalities received 80 percent of their total revenues from intergovernmental transfers (in Giugale and Webb eds. 2000: 220). Surprisingly enough, the calculations of the Ministry of Finance report an even higher centralism of the Mexican fiscal arrangement. As can be seen form the following chart, in comparison to other countries, the financial centralization of Mexico is particularly accentuated.[15]

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[14] Mexico is a federal republic formed by 31 states a Federal District and 2427 municipalities. All 31 states are divided in municipalities that represent the smallest political units of the federation. The Federal District is divided in 16 delegations that have different legal status than municipalities. It is important to mention that the whole territory is divided in municipalities (and delegations); according to the constitution, there are no other intermediate tiers of government between the states and the municipalities.

[15] According to my own calculations, on average, from 1982 to 1996 municipalities' own revenues accounted for 35.7 percent of their total revenues, without including the local allocation of discretionary transfers and direct federal investment. Moreover, in comparison to other countries, between 1980 and 1996, local governments in Mexico accounted, on average, for 2.9 percent of total revenues. This figure contrasts sharply with the average of a group of Latin American countries (4.2 percent) and of a group of OECD countries (12.4 percent). See appendix 1 for further reference.

Figure 2. Financial dependency of local governments
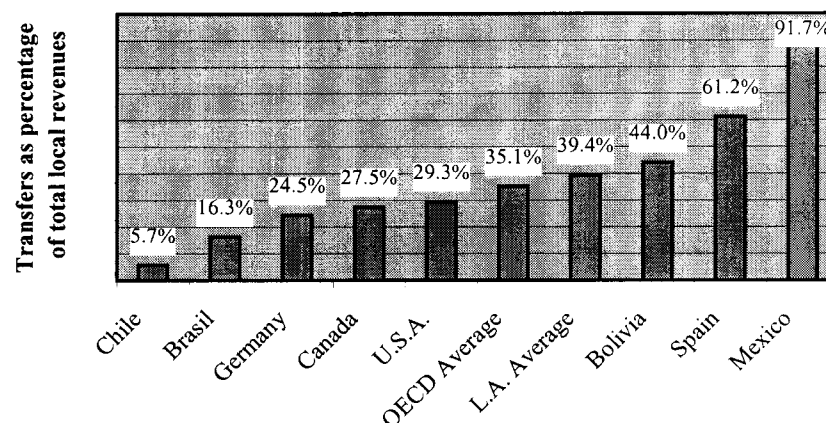
Source: SHCP, 2000.

For the last twenty years the government has faced the high centralism of Mexico's intergovernmental financial arrangement by following a decentralization strategy consisting of transferring revenues from the central to the subnational governments, rather than strengthening the tax capacity of the states and municipalities. In part, this strategy has been a result of the creation of National System of Fiscal Coordination (*SNCF*) in 1980. Although in principle, the Mexican constitution establishes a formal distribution of fiscal sources for each tier of government, in practice, the *SNCF* guides the distribution of resources between tiers of government.[16] The *SNCF* dictates that subnational governments yield a part of their tax bases to the central government, in exchange for an increase in unconditional federal revenue-sharings.[17]

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[16] Constitutionally, the federal government may obtain its revenues from the following sources: international trade, exploitation of natural resources, utilities derived form credit and insurance institutions, provision of public services of federal scope, electric energy, gasoline and other by-products of petroleum, and production of alcoholic beverages. Unlike the federation, the income sources of the states are not constitutionally bounded. In principle, states can charge for all activities in their jurisdiction, except for those reserved to the central government.

[17] According to the *SNCF* the following taxes are exclusively reserved to the federation: income tax, value added tax, special tax on production and services, taxes on new cars, and taxes on import and export transactions. The own revenues of the states vary form state to state, but in general states rely on: payroll taxes (which accounts for almost half of state's tax revenues), taxes on entertainment, taxes on the transfer of patrimonial goods, and taxes on commercial transactions of goods exempted from the payment of the general sales tax.

The *SNCF* is a contract between the federal government and the states; however, the Law of Fiscal Coordination (*LFC*)[18] incorporates the municipalities in this agreement by establishing that states should transfer at least 20 percent of the federal revenue shares to their municipalities.[19] Subnational governments get their revenue-shares according to various formulas that are calculated as a proportion of the *Recaudacion Federal Participable* (*RFP*) that is composed mainly of the shared taxes collected from the federal income tax, the value added tax and the fees from the extraction of minerals and oil. Both the characteristics of the funds and their allocation formulas have greatly varied over time. Currently, the *SNCF* is composed by two funds: the Fund for Municipal Promotion that the states distribute among their municipalities in proportion to their collection of property taxes and fees from the provision of water, and the General Fund of Revenue-sharing that is composed by 20 percent of the *RFP*.[20]

Revenue-sharings represent the single most important source of municipal revenues. According to my own calculations, on average, from 1982 to 1996, the revenue shares accounted for 53 percent of the total municipal revenues (see appendix 1, table 2). The rest of the municipal revenues mainly come from the collection of own-source revenues, from the contact of public debt, and from transfers granted by the federal and the state governments. Because most municipal governments in Mexico do not use debt as a means for financing their infrastructure, and because a thorough analysis of the transfer system will be provided in the next section, the rest of this section will only present the main characteristics of the Mexican municipalities' own-source revenues.[21]

Municipalities in Mexico have the following sources of own revenues: taxes, user charges and '*aprovechamientos*'. As for the taxes, the property tax is by far the most important tax levied by municipalities, but they also have minor taxes such as taxes on the translation of property and of local lotteries. The user charges are

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[18] The *LFC* is the legal document that regulates de operation of the *SNCF*.

[19] While the *LFC* establishes the guidelines for the distribution of shares from the federation to the states, each state Congress regulates its own distribution of shares from the state to their municipalities. However, in practice, all state Laws of Fiscal Coordination follow the same guidelines.

[20] The Fund for Municipal Promotion is formed by 1 percent of the *RFP* and is directly transferred from the states to the municipalities according to a federal formula. The General Fund of Revenue-sharing is distributed according to a formula based on the following three criteria: i) 45.17 percent is distributed to the states on an equal per capita basis; ii) 45.17 percent is allocated on a historical or 'inertial' basis, starting with the states' own revenues just before the system initiated in 1980 and gradually modified by the tax effort of the states; and iii) 9.66 percent is allocated on an inverse proportion to the previous two allocations. This last portion of the formula has a compensation objective.

[21] In order to contract debt, Mexican municipalities need the approval of their state Congresses. Perhaps for this reason the use of debt by municipalities has kept at a low level compared to other Latin American countries like Brazil and Argentina. For an explanation of subnational borrowing in Mexico see M. Giugale, F. Hernandez and J. Oliveira, "Subnational borrowing and debt management." in M. Giugale and S. Webb eds. (2000).

divided into two categories: "*derechos*" and "*productos.*" *Derechos* are the fees paid in exchange for the provision of public services by the municipalities. *Productos* are revenues collected by the municipalities for the use and exploitation of its patrimonial goods, such as the sale or the rent of a municipal property. Finally, the *aprovechamientos* represents all the resources that the municipalities receive directly from its citizens but that cannot be classified in any of the other revenue categories, mainly fines and surcharges.

The property tax and the fees from the provision of water are by far the main sources of own revenues. Although the provision of water is a very important source of local revenues (mainly for medium-size and big municipalities), neither local authorities nor academics have placed particular attention to study how the revenues from the water fees –and from other public services– could be increased. Perhaps, because the charge for public services is politically sensitive, the property tax remains the main own-source of revenue of most local governments in Mexico. According to Diaz-Cayeros and McLure, this tax comprises 13 percent of municipalities' total net revenue and 74.2 percent of their tax revenues (in Giugale and Webb eds. 2000: 194).

Even that since municipalities were granted the right to collect the property tax in 1983 this tax has been the main source of their local revenues; however, the collection of this tax is still very low. According to the Ministry of Finance, between 1989 and 1998 the property tax accounted on average for only 0.21 percent of the GNP. As shown in the following graph, this low tax collection stands out when compared to other countries.

**Figure 3. Comparison of taxes collected
by subnational governments**
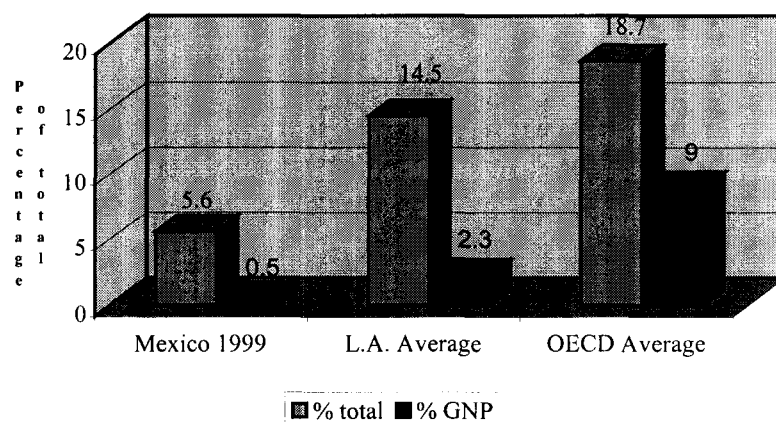
Source: SHCP, 2000.

There are several reasons why the collection of the property tax remains so low. Besides the evident high administrative and political cost associated to the collection of this tax, in Mexico the Congress of the states and not the municipalities have the power to set the tax rates. Similarly, updates in property values and changes to the tax bases should also be approved by the legislatures of the states. While for medium-size and big municipalities the state's control of the rates and bases represents an evident restriction to increase their own revenues, perhaps for most municipalities this is no so incongruent, because due to their lack of administrative infrastructure, the states aid them with the administration of the property tax.[22]

Besides own-source revenues and unconditional revenue-shares, municipalities also get conditional transfers from the federal government. While the revenue shares and the own-source revenues of the municipalities have remained more or less unchanged in the last twenty years, the allocation of direct transfers of resources have gone through significant changes. In general, the allocation of these transfers has followed a decentralization pattern that was visibly reinforced during President Zedillo's administration (1994-2000). The following section briefly reviews the main characteristics of the Mexican expenditure decentralization policies of the last few years, which serves as a background to understand the creation of the *FAISM* at the end of 1997.

2.1. Brief introduction to Mexico's expenditure decentralization policies

During the administration of President Salinas (1988-1994) and up to 1995 the decentralization of federal resources was channeled through a program called *Solidaridad,* forming part of item 26 of the Federal Budget (*I26*). Although *Solidaridad* had the explicit objective of strengthening the municipal institutions, diverse authors and local authorities have criticized this program for being too centrally driven (Rodriguez 1999; Vega 2000; Molinar and Weldon in Cornelius *et al.* 1994 Garman *et al.* 2001). They argue that the Ministry of Social Development (*Sedesol*) bypassed the municipal institutions by centrally allocating the funds of this program to the 'committees of *Solidaridad*' that were explicitly formed by the central government to attract these resources.

The opposition parties also criticized *Solidaridad* as being a program driven more by political objectives of the federal government than by legitimate local demands. Specifically, they argued that the *Sedesol* allocated the resources of *Solidaridad* to the geographical regions were the official party (*PRI*) needed to gain more votes in order to broaden its political power. Thus, in 1996 Congress reformed *I26* to further the decentralization process in favor of the states and the municipalities, through a public formula for the distribution of resources (expenditures) from the national government to the states. *Sedesol* calculated this

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[22] It is worth noting that out of the 2427 municipalities of the country, 3.8 percent are metropolitan, 3.8 percent are urban and 92.4 percent are rural and semi-urban.

formula according to the proportion of 'relative' state poverty to total national poverty. The relative poverty of each state was measured according to their levels of a lack of financial resources and to an index of unmeet needs. (Scott 2000: 24). Similarly, each state needed to calculate its own formula to distribute the resources among its municipalities. However, the *Sedesol* did not force the states to follow any specific criteria in the design of their formulas. The independence to decide how to distribute the resources among their municipalities gave the state governments more power (Rodriguez 2000: 19). Along with these changes, the 1996 reform renamed the *Solidaridad* program to 'overcoming poverty'.

The opposition parties saw the 1996 reform as a positive step to de-politicize the allocation of federal transfers. However, they soon complained about the state's independence in calculating the formulas. The right wing party (*PAN*) argued that the states governed by the *PRI* designed their formulas in such a way that the municipalities of the *PRI* were receiving substantially more transfers than the municipalities of the PAN.

In 1997 the *PRI* lost the majority of the seats in Congress and the *PAN* pushed for another reform of the intergovernmental transfers system. The following year Congress approved by unanimity a reform to the *LFC* by which the resources from *I26* that had been decentralized to the municipalities since 1996, would be channeled through a new budgetary item called 'Federal Contributions to States and Municipalities' (*I33*) through the 'Fund for Municipal Social Infrastructure'.[23] With that reform, earmarked transfers –that have existed in Mexico for at least thirty years–formally entered to the *NSFC* (Courchene and Diaz-Cayeros in Giugale and Webb eds. 2000: 210).

2.2. Main characteristics of the FAISM

Since 1998 the *FAISM* has been the main program of intergovernmental transfers to municipalities.[24] Through this fund the federal government allocates resources directly to the municipalities, which in turn assigned them to a set of social projects of basic social infrastructure (*LFC* 1998: art. 33).

The *FAISM* is composed of about 2.2 percent of the national 'assignable taxes' or *RFP*.[25] These financial resources are distributed from both the federation to the states, and the states to their municipalities according to explicit public formulas that are written in the *LFC*.[26] There is a single formula (*F1*) for allocating resources from the national government to the states and from the states to their municipalities.

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[23] Particularly, the *FAISM* was created with the funds that formed part of the Fund for Local Social Development of the *I26*.

[24] Formally, the *FAISM* accounts for only the municipal part of one of the seven funds that constitute *I33*.

[25] See section 2 of the paper for a description of the *RFP*.

[26] The fact that these formulas are written in the *LFC* should not be underestimated, because it means that any modification needs to be approved by the lower house of Congress.

However, in the cases when the states cannot apply this formula, either because of its complexity or for the lack of data to make the calculations, they can use a simpler formula (*F2*). The federal government has always used *F1* to allocate the resources to the states by following two criteria: *1)* an Index of Global Poverty and *2)* an equity criterion. Since the operation of this formula is very complex and only six states use it to distribute the *FAISM* to their municipalities, I will not discuss it further.

F2 has been used by all but six states to distribute the *FAISM* between their municipalities. This formula is calculated by adding the following four variables and assigning equal weight to each: *1)* employed population that gains more than two minimum wages, *2)* illiterate population of fifteen years of age or older, *3)* drainage availability, and *4)* electricity availability. The formula is designed to consider a municipality poorer if a high proportion of its population gains less than two minimum wages, is illiterate, and has no access to drainage and electricity. Such a municipality would receive more funds from the *FAISM* than a municipality where this proportion is lower (Scott 2000: 24).

Once the states allocate the *FAISM* across its municipalities, each municipality decides —together with the local population— how they are going to spend these resources on the specific projects established in the *LFC*. The funds of the *FAISM* are conditional transfers earmarked for the following projects of basic local infrastructure: water, sewers, drainage, urbanization, electrification in rural areas and poor neighborhoods, basic health and education, roads, housing improvements, and productive rural infrastructure. Municipalities may only use up to 2 percent of the resources of the *FAISM* to finance their 'institutional programs' (i.e. training of personnel, acquiring new managerial techniques, etc.)

3. Methodological framework: data, sample and calculations

In this section I describe the methodology used to assess the impacts of the *FAISM* on the tax effort of Mexican municipalities. The section is composed of the following three parts; first, I mention how I selected the case study; second, I introduce the qualitative and the quantitative sources of the information; and last, I explain how the calculations were performed.

3.1. Puebla: a case study

I selected the state of Puebla to conduct this study because it was the only state that provided me with the data. In Mexico, municipal information is by law of public access. However, in practice there are many difficulties for getting municipal information, and especially financial data. For this reason, researchers either focus their analysis at the state level (rather than at the municipal one) or simply modify

their research projects to fit with the scant available information.[27] The research design of this paper was not an exception. Through a set of formal and informal contacts, some public officials in the Ministry of Finance of the state of Puebla provided me with the data to perform the analysis.

Puebla, as most other states in Mexico, has a very wide distribution of population and wealth among its municipalities.[28] The municipality of Puebla, which is the capital of the state and the fourth largest city in the country, has little more than one quarter of the population and concentrates the biggest amount of the wealth of the state. In the year 2000 the municipality of Puebla collected by itself 60 percent of the total property taxes of the state and more than 70 percent of the total collection of water fees of the state. If the nine biggest municipalities of the state are taken as a group, the accentuated concentration of the state of Puebla becomes more evident: in the year 2000 the nine municipalities collected 80 percent of the property tax and 90 percent of the fees from the provision of water, which means that the remaining 208 municipalities only collected 20 percent of the total property tax and 10 percent of the fees form the provision of water.[29]

3.2. The data

In order to test the impacts of the *FAISM* on the local tax effort, this paper relied on both quantitative and qualitative information. In terms of the quantitative information, the following three pieces of data were required: *a)* the amounts of own-source revenues collected before and after the introduction of the *FAISM*; *b)* the distribution of the *FAISM* per municipality; and *c)* some general information such as the total revenues collected by each municipality and the GDP of the state of Puebla. From these three pieces of data, the own-source revenues was by far the most difficult to get. An official of the state of Puebla provided me with information on the collection of property taxes and water fees for each of the 217 municipalities from 1993 to 2000.[30] This information was provided in three different databases, each with its own terminology, therefore I had to systematically code all the data in order to run the calculations. An official of the *Sedesol* provided me with the information of the *FAISM*.[31] Finally, the general information about the finances of the

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[27] Virtually all students of municipal finance in Mexico have underlined the difficulties of getting data.

[28] After the state of Oaxaca, Puebla is the state with more municipalities in the country.

[29] These municipalities are: Tehuacan, Huauchinango, San Pedro Cholula, Atlixco, Tezihuatlan, Izucar de Matamoros, San Martin Texmelucan, San Adres Cholula and Puebla.

[30] Although the property tax and the fees from the provision of water do not account for all the local own-source revenues, they represent the biggest share. For this reason they can be taken as a proxy of the total own-source revenues of the municipalities.

[31] According to the law, states should publish every year in their local official newspapers the amounts of *FAISM* that each municipality will get. However, in practice it is very difficult to get hold of these local newspapers. Moreover, since the control of the resources of the *FAISM* has significantly shifted away form the *Sedesol*, the officials of this Ministry argue that they are not

municipalities and of the GDP of Puebla was found in several written and electronic publications of the National Institute of Statistics (*INEGI*), specifically from its database on municipal information (*SIMBAD*).

The qualitative information was gathered with the support of the "Program of Budgeting" of the Center of Economic Research in Mexico City, the Ford Foundation, and the Mexican Network of Researchers on Local Governments. During the months of January and April, I conducted several interviews in Mexico with government officials, municipal presidents and academics.[32] My main source of information was an interview with the Undersecretary of Revenue of the state of Puebla.

3.3. The calculations

The lack of information on public finance at the local level in Mexico as well as in other developing countries has impeded the development of a consistent methodology to study the effects of grants on local tax effort. Therefore, this paper follows a method of basic calculations of descriptive statistics used in a study of the World Bank about the Colombian case. In this paper I use some of the methodology proposed by the Colombian study in addition to other calculation that appropriately capture the variability in the local tax effort. Before introducing the calculations, a brief discussion of the usefulness of the concept of tax effort is presented.

Although in the literature of fiscal decentralization most scholars use the concept of 'tax effort' as an indicator of the variability in the revenues collected by local governments, there is an astonishing lack of consistency in the use and the meaning of this term. For this reason, some scholars have questioned the use of this term (The World Bank 1995: 17). Traditionally, the theory of public finance has typically defined 'tax effort' as a difference in the ratio of taxes to a measure of the tax base, usually GDP (IMF 1997: 10).[33] The lack of information about tax bases at the local level may be the reason why this standard definition of tax effort –which is close to the concept of 'tax capacity' (taxes as proportion of income)– is not generally used in the literature. Instead, the concept is used as measurement of the tax rates and/or the actual collection of taxes. In this paper, I use the term 'tax effort' to refer to the tax and fee collection of the municipalities. Notwithstanding this lack of rigor in the use of the concept, I agree with an assertion of a document of the

responsible any more of the collection of this information. Thus, I got this information through a personal contact with an official that works in this Ministry that put all these data together to conduct an academic research.

[32] I interviewed two specialists of the Center of Economic Research (*CIDE*) and two municipal presidents of the State of Mexico.

[33] According to G. Jenkins and G. Shukla (1999: 19-22) the tax effort of a country is defined as the ratio of actual T/Y ($T=Tax$ revenue, $Y=Net$ National Income) to the estimated T^*/Y (tax capacity). For a detailed discussion of the definition of 'tax effort' see: IMF (1997: 10-11).

World Bank, that on the whole, it is better to have even crude measures of capacity, than none at all (1995: 17).

Because the objective of the paper is to capture if an increase in transfers (and therefore a deepening of vertical fiscal imbalance) changed the fiscal behavior of local governments, I divided the data in two periods: from 1993 to 1997, representing the pre-grant period, and from 1998 to 2000, referring to the post-grant period. The following set of different calculations were performed on all the municipalities in the pre and the post-grant period:

1) The simple average of the collection of property taxes and water fees.
2) The simple average of the proportion of the property taxes and water fees over Puebla's GDP.
3) The average annual rate change in the collection of property taxes and water fees.

In order to take account of the heterogeneity of Puebla's municipalities (see appendix 2), some further calculations on different groups of municipalities sorted by population size and level of welfare were also be calculated. It is worth noting that in addition to the conventional classification of local governments by their population size, this paper also classifies the municipalities by their level of welfare, which is rarely seen in the literature. As about the grouping by size, this paper follows the population categories proposed by Cabrero and Orihuela (2000: 10) with an addition of one more category. Thus, municipalities were divided in the following five categories: *1)* from 0 to 2,500 inhabitants, *2)* from 2,500 to 15,000 inhabitants, *3)* from 15,000 to 100,000 inhabitants *4)* from 100,000 to 1,000,000 and *5)* from 1,000,000 and more inhabitants. The categorization of municipalities by level of welfare was made according to the index of municipal welfare provided by *INEGI* that ranks municipalities on a seven-point scale according to 36 different socio-economic and demographic variables.[34] The following two calculations were performed to all the municipalities both by population size and by level of welfare:

1) The simple average of the collection of property taxes and water fees.
2) The average annual rate change in the collection of property taxes and water fees.

The simple average was calculated by adding the collection in the pre and the post-grant period and divided by the number of years of each period (5 and 3). The average annual rate change was calculated as the average of the yearly change in collection in the pre and the post-grant period and divided by the number of

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[34] A summary of descriptive statistics of the distribution of municipalities by categories of population size and by level of welfare, together with a description of the 36 variables used to create the index of municipal welfare are presented in appendix 2.

differences of each period (4 and 3) respectively. The purpose of calculating the annual rate average in addition to the simple average is to try to capture the change in tax collection between years, which I argue accounts for a better indicator of the tax effort. However, since this average rate calculation is not commonly used in the literature, I will present the results of both types of calculations.

Before getting to the actual discussion of the findings of the paper one comment about the presentation of the results should be made. Originally, all the operations were separately calculated for the collection of property taxes and for the fees from the provision of water —the results of all these calculations are presented in the tables of appendix 3. However, for practical reasons, in a few cases this paper will discuss these figures as an aggregate of taxes and fees that accounts to a proxy for total own-source revenues, without making specific references to each of this revenue sources.[35] Even though the literature on public finance has clearly underlined the different characteristics of taxes and user charges,[36] for the purpose of this analysis, overlooking these distinctions will not adversely affect the results. This is so because, regardless of their differences, taxes and fees are both sources of own municipal revenues that are directly collected by the local treasuries. Moreover, since the authorities of the state of Puebla provided me with both the information about the collection of the property tax and fees for the provision of water, I decided to aggregate the data on the water fees with that on the property taxes, rather than disregard the water fee data completely. Finally, it should be mentioned that originally all the calculations were made in both nominal and real terms; however, the results will only be presented in the text in real terms –the nominal calculations are presented in the tables of appendix 3.[37]

4. Discussion of findings

The theoretical models on the impacts of grants on local own-source revenues introduced in section 1 will serve as the framework for interpreting the results. According to theory, municipalities may respond to the transfer of grants by either increasing (stimulating) or decreasing (substituting) their tax effort. While in the first case municipalities reduce their collection of own-source revenues, in the second they either kept their same levels of own-source revenue collection or increase them. Thus, the expected results of these calculations could be formulated in the following proposition:

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[35] The account 'own-source' revenues that appears in the tables does not refer to *all* the own-source revenues of the municipalities, but to the aggregate of property taxes and water fees, that represent a proxy of all local own-source revenues.

[36] See: Bird and Slack (1983) and Peterson (1997).

[37] The real numbers of the calculations represent constant prices of 1994. The source of the deflator is the Central Bank of Mexico (*Banco de México*).

Proposition 1: If the tax effort exerted after the grant was given (post-grant period) is lower than in the pre-grant period, then there is support for the 'rational' model. Conversely, if the tax effort is higher in the post that in the pre-grant period, then there is support for the 'flypaper effect' model.

Overall, the results show that the municipalities of the State of Puebla lowered their tax effort after the introduction of the *FAISM*. However, in a few cases the calculations showed a higher tax effort in the post-grant period. Although the results are not altogether consistent, I argue that the evidence in favor of the rational model is much stronger than the evidence for the flypaper effect model. The base of this defense of the fiscal laziness model is twofold. On the one hand, I argue that the calculations that give support to a substitution effect are more meaningful than those in support for a stimulation effect. On the other hand, the support for the substitution effect was reinforced in almost all the interviews that I conducted.

Following the order of the calculations introduced in the preceding section, I will first present the results of the impact of the *FAISM* on the tax effort on all the municipalities taken as a single group. The following table summarizes the results of both the simple average of tax collection before and after the grant was introduced and the average annual rate change in the pre and post-grant period.

Table 1
Tax effort in the pre and the post-*FAISM* periods

	Simple average		Rate average	
	Pre-FAISM	*Post-FAISM*	*Pre-FAISM*	*Post-FAISM*
Property tax (real)	49,641,000	50,677,624	7.8	2.8
Water fee (real)	56,359,047	66,502,786	17.3	4.1
Own-source (real)	106,000,048	117,180,411	12.3	3.5
Property tax/GDP	0.116	0.095	0.036	0.004
Water fee/GDP	0.131	0.122	0.120	-0.008
Own-source /GDP	0.247	0.217	0.075	-0.003

Own calculations

In real terms, the municipalities collected more property taxes and more water fees after the grant was introduced. However, when the average annual rate of change is calculated, it turns out that the rate of increase was higher in the pre than in the post-grant period. The municipalities had an average rate of collection of own-source revenues of 12.3 percent in the pre-grant period compared to only 3.5 percent in the post-grant period. Moreover, when the municipal collection of the property tax and the fees from the provision of water are taken as a proportion of GDP of the state of Puebla, the results give strong support for the 'rational model.' The collection of water fees and of property taxes went down as a proportion of GDP after the *FAISM*

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was introduced both as a simple average and as an average annual rate change. However, when taken as the simple average, the proportion went down to only 3 percent, while at the annual rate change there was a decrease of almost 8 percent. The results of the calculations of the local revenue collection as a proportion of the state's GDP are particularly significant because this measurement is —from all the calculations performed— the closest to a true measurement of tax effort.[38] Therefore, these results support the rational model.

The results presented so far, give evidence in support of the 'rational' model. This support accentuates when the calculations are performed not on all municipalities as a single group, but on the different categories of municipalities of diverse population sizes and welfare levels. Bellow, two graphs and two tables will be presented: the graphs illustrate the variation on the tax effort —as the average annual rate change— before and after the introduction of the *FAISM*, and the tables present the results of the simple average collection in the pre and post-grant period.

Figure 4. Pre and post-*FAISM* average annual rate change in the collection of own-source revenues (%)

	0-2,500	2,500-15,000	15,000-100,000	100,000-1,000,000	1,000,000 +
■ Pre	6.15	3.65	5.60	20.51	14.75
☐ Post	-1.96	-2.94	-2.32	3.81	5.87
■ Change	8.11	6.59	7.92	16.70	8.88

Municipal categories by population size

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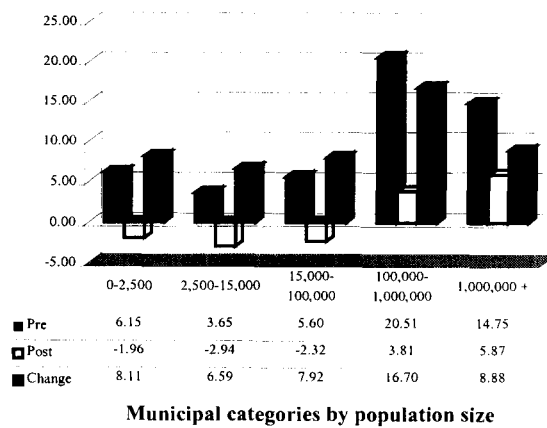
[38] Formally, this is precisely a measurement of 'tax capacity' (tax yield over GDP).

**Figure 5. Pre and post-*FAISM* average annual rate change
in the collection of own-source revenues (%)**

	1	2	3	4	5	6	7
■Pre	7.32	12.31	-1.47	9.41	9.00	2.67	14.66
□Post	-4.97	-1.67	-9.18	-4.61	-1.48	1.05	5.18
■Change	12.29	13.99	7.71	14.02	10.48	1.61	9.48

Municipal categories by level of welfare
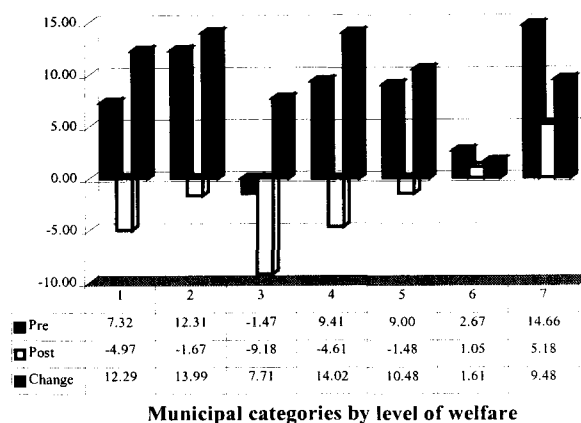
The most striking observation from the results of these two graphs is that when calculated as the annual rate change average, the own-source revenue collection of all sizes and all welfare level of municipalities dropped in the post-grant period. According to these results, there has been a generalized decline in tax collection both in small and in big municipalities and in developed and underdeveloped ones. This finding runs contrary to the suspicion of Puebla's officials that expected that a decline in tax effort might be happening in the small and probably in the medium-size municipalities, but certainly not in the big ones. However, if one looks at the 'amount' of the difference in the annual rate change average in the pre and the post-grant period, then the results vary both by size and by level of welfare. As expected by Puebla's officials, municipalities with the lowest levels of welfare reduced their tax effort in the biggest proportion. Notice, for example, that the municipalities in the two lowest welfare groups presented a change in collection of approximately 12 to 14 percent, while municipalities in the sixth level of welfare reduced their collection by only 1.6 percent. However, the magnitude of these differences changes when the analysis is performed on municipalities with different population sizes. In this case, the results are ambiguous because for example, both the smallest and the largest groups of municipalities present the same proportion of decline in revenue collection (approximately 8 percent).

The divergence in the results of the rates of change in tax effort when municipalities were grouped by different categories, suggests that the interpretation of the proportion or degree of change among different groups of municipalities is not straightforward. Even if different groups of municipalities present similar proportions of change, this proportion is determined to a big extent by the 'size' of the amounts collected by each group of municipalities. Therefore, the results of the

proportions or degrees of change by different categories of municipalities should be carefully interpreted. Due to the problems of interpretation of these results, it is important to analyze not only the average annual rate change, but also the simple average collection of the different groups of municipalities in the pre and the post-grant period. The following two tables report the results of these calculations in real terms.

Table 2

Simple average of own-source revenue collection in the pre and post-grant period for groups of municipalities with different welfare levels

	Property tax (real)		Water fees (real)		Total own-source (real)	
Welfare	Pre-FAISM	Post-FAISM	Pre-FAISM	Post-FAISM	Pre-FAISM	Post-FAISM
1	1,110,031	832,111	189,965	86,414	1,299,996	918,525
2	597,404	607,500	573,710	436,729	1,171,114	1,044,230
3	2,898,755	2,683,875	2,637,311	1,359,303	5,536,066	4,043,178
4	1,680,564	1,873,933	2,483,359	1,858,993	4,163,923	3,732,926
5	2,923,214	3,162,063	4,037,890	3,201,097	6,961,105	6,363,161
6	1,584,418	1,364,226	1,843,221	2,197,921	3,427,639	3,562,147
7	38,846,614	40,153,916	44,593,591	57,362,330	83,440,205	97,516,246
Total	49,641,000	50,677,625	56,359,047	66,502,787	106,000,048	117,180,412

In this welfare index, 1 stands for the lowest level of welfare and 7 for the highest.
Own calculations.

Table 3

Simple average of own-source revenue collection in the pre and post-grant period for groups of municipalities of different population sizes

	Property tax (real)		Water fees (real)		Total own-source (real)	
Size	Pre-FAISM	Post-FAISM	Pre-FAISM	Post-FAISM	Pre-FAISM	Post-FAISM
1	198,616	171,294	215,668	181,074	414,284	352,368
2	3,390,210	3,148,756	3,391,794	2,528,212	6,782,004	5,676,968
3	11,518,618	11,685,851	10,329,296	8,631,760	21,847,913	20,317,611
4	4,995,548	6,627,971	7,209,580	7,444,620	12,205,128	14,072,592
5	29,538,009	29,043,752	35,212,709	47,717,121	64,750,719	76,760,874
Total	49,641,000	50,677,625	56,359,047	66,502,787	106,000,048	117,180,412

The population sizes are as follows: 1= 0-2,500 inhabitants; 2= 2,500-15,000 inhabitants; 3= 15,000-100,000 inhabitants; 4= 100,000-1,000,000 inhabitants; 5= 1,000,000+ inhabitants. Own calculations.

According to the results reported in the previous two tables, the simple average of collection in the pre and post-grant period varies across municipalities with different size populations and levels of welfare. Overall, the results show that while big and developed municipalities increased their collection in the post-grant period, small and medium size municipalities with low and medium levels of welfare decreased their revenue collection.[39] This difference in the behavior of revenue collection is

[39] It should be noted that while small and medium population size municipalities (up to 100,000 inhabitants –categories 1,2, and 3) show a trend of collection similar to that of municipalities with low and medium levels of welfare (levels 1 to 5), highly populated municipalities (from 100,000

not only congruent with the expectations of Puebla's officials, but it was also supported by interviews with municipal bureaucrats. According to all interviewees, small underdeveloped municipalities may reduce their own-source revenue collection for the following two reasons: *1)* because they still have strong patronage systems that exempt some citizens from the payment of taxes and fees;[40] and *2)* because the *FAISM* is simply giving "too much" money to these municipalities. As for the first element, state authorities are aware of the low revenue collection of the small municipalities; however, their capacity to enforce tax compliance is limited.[41] According to an interviewee, the state government cannot make municipalities increase their revenue collection because municipalities have wide discretion in the enforcement of tax payment. In many cases, municipal treasuries comply with the law by sending out the tax receipts, but do not encourage payment (i.e. by sending further notifications). At the end of the day, citizens accumulate fines for due payments that negotiate at discount rates with the authorities.

As regard the disincentive effect of the *FAISM* to the revenue collection of small and medium size municipalities, both municipal and state authorities are aware of the huge 'substitution' process that is taken place. According to a high level bureaucrat of the state government, "the resources of the *FAISM* are so huge, that nothing can be done to stimulate the collection of local resources." When a municipal president was asked about this issue, he clearly answered: "of course municipalities are reducing their own revenue collection, the *FAISM* is simply too big." As a corollary to this assertion, a current study of the University of Querétaro has found that some municipalities are even returning the resources of the *FAISM* back to the state government because they do not have enough capacity to spend the money.[42] Moreover, this lack of capacity to channel the resources to the appropriate local infrastructure projects is resulting in an increase of other non-capital expenses.[43]

The disincentive effect of the *FAISM* on the local revenues of municipalities of different sizes and levels of welfare could be further explored by looking at the proportion (in number of times) that the *FAISM* represents to the total of own-source

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to more than a million inhabitants –categories 4 and 5) have a trend similar to that of the municipalities with the two highest levels of welfare. This observation shows some relationship between the size of the municipalities and their levels of welfare; while big municipalities tend to have high levels of welfare, small municipalities tend to have smaller levels of welfare.

[40] This is commonly observed in rural municipalities where local authorities have close family and friendship ties with the population.

[41] It should also be obvious that authorities are not willing to trade the high political and economic costs of tax compliance for the negligible revenues that the small and poor municipalities collect.

[42] I got this information from an in informal talk with two of the researchers involved in the study.

[43] For example, some interviewees commented that they have noticed an increase in the number of new cars in various municipalities of the state. These kinds of observations have been endorsed by the specialized literature. See for example CIDE (2000).

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local revenues. The following table reports these results by population size and level of welfare of the municipalities:

Table 4
FAISM received by groups of municipalities as a proportion of total own-source revenues

Level of Welfare	Proportion FAISM/own-source revenues	Population size	Proportion FAISM/own-source revenues
1	67.0	0-2,500	6.3
2	15.0	2,500-15,000	13.4
3	12.8	15,000-100,000	6.5
4	5.7	100,000-1,000,000	1.1
5	5.5	1,000,000	0.3
6	4.1		
7	0.5		
Total	2.2		2.2

Own calculations

Just by making a rough comparison of table 4 with tables 2 and 3 it becomes apparent that there is some relationship between the proportion of the *FAISM* on the own-source revenues and the 'extent' to which the different categories of municipalities changed their tax effort behavior after the grant was introduced. Although I do not provide a precise measurement of the extent of this change, in general the figures show two main trends: *1)* that small and medium population size municipalities (up to 100,000 inhabitants) with low and medium levels of welfare (groups 1 to 5) are the ones that present the highest proportions of *FAISM* to own-source revenues and are consequently the ones that reduced their tax effort in the post-grant period. Conversely, highly populated municipalities (from 100,000 to more than 1 million inhabitants) with high levels of welfare (group 6 and 7) are the ones that show the lowest proportions of *FAISM* to own-revenues and are consequently the ones that did not reduced their tax efforts after the *FAISM* was introduced.

The increase of own-source revenue collection of big and developed municipalities confirms the expectations of Puebla's officials. According to the state government, big municipalities cannot reduce their tax effort because they face high operating costs for covering their various spending responsibilities. However, because the resources of the *FAISM* are earmarked to the investment of certain infrastructure projects and in principle these resources cannot be used for other purposes,[44] municipalities have no other choice but to maintain their revenue collection at the same pace. Moreover, unlike smaller municipalities, more developed municipalities already have the appropriate infrastructure (updated

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[44] I say that in 'principle' because in 'practice', as economists argue, money is fungible and the authorities find ways to redirect resources to other purposes.

cadastral values, trained personnel, computerized systems of payment, etc.) to collect taxes and fees, so there is no reason why they should opt to lower their collection, particularly because people that pay taxes, pay them on a regular basis. Furthermore, the proportion of the *FAISM* to the total own-source revenue of big municipalities is not high enough (at least in comparison to the proportion of smaller municipalities) to 'threaten' the levels of local revenue collection.

So far, the analysis of the results has centered in the interpretation of the change in the collection of own-source revenues before and after the introduction of the *FAISM*; however, nothing has been said about the particular differences in the collection of water fees and property taxes. As about the collection of the property taxes among the different groups of municipalities, while small and underdeveloped municipalities reduced or maintained their levels of property tax collection, the big and developed municipalities slightly increased it. To help clarify this fact it should be mentioned that although in Puebla municipalities are formally in charge of the administration of the property tax, in practice only the nine most developed municipalities of the state have some degree of control over the rates and bases of this tax.[45] These municipalities have the right to propose adjustments to the tax rates and expansions of the tax bases to the state legislature, who is in charge of approving the changes.[46] Moreover, these nine municipalities are the only ones that directly administer the collection of the property tax. The remaining 208 municipalities neither have the administrative capacity to collect the tax nor have any kind of control over their tax rates and bases. Since 1982, these municipalities have an agreement with the state government to help them with the administration and control of the property taxes and the user charges. The state government, for example, prepares the tax receipts on behalf of the municipalities and sends them to the local treasuries, who are in charge of the collection.[47]

Overall, excluding the municipalities with the lowest level of welfare (group 1) and the municipalities between 100,000 and one million inhabitants —that presented important changes in their tax collection after the grant was given— most groups of municipalities only 'slightly' varied their property tax collection form the pre to the post-grant period. This observation raises some theoretical concerns about the property tax such as its inelasticity and its complexities to modify the tax yields in the short term. Related to this last point is the issue of the update of the valuation of the property, whose inherent delay adversely affects the local tax collection.[48]

[45] See note 29.

[46] According to an academic of the Autonomous University of Puebla, only two out of this group of nine municipalities complies with their annual laws of revenues, which are the legal documents that established the amounts of revenues municipalities plan to collect in each fiscal year. Of course none of the remaining 208 municipalities of the state complies with this law either.

[47] In exchange of the support received by the state government, municipalities pay the state 10 percent of the total revenues collected in each month. See art. 7 of the "Agreement of Administrative Cooperation on Taxes and User fees of the State of Puebla and its Municipalities".

[48] Currently in Puebla the update of cadastral values is not directly performed by the state government (as in the past) but by a technical autonomous institute.

According to the state authorities, the last update of cadastral values took place about seven years ago[49] and the state is currently working on a new update scheme in order to comply with the prescription of the last constitutional reform.[50] The lag in the valuation of property helps to explain the limited increase in the property tax collection of big (urban) and developed municipalities; however, it does not help to explain the reduction in the tax collection of the small/medium and underdeveloped municipalities. To some extent this decrease is due to the fact that most property owners that live in small and medium (rural and semi-urban) size localities pay minimum fixed annual payment that do not really provide local treasuries with substantial resources.[51] If this low pay capacity of property-owners is complemented with the fact that the tax bases of most municipalities do not really expand over time (both for political and administrative reasons) then, the result is a continuous erosion of the total tax yield.

Finally, like with the property taxes, the collection of fees from the provision of water varied according to both the population size and the level of welfare in the pre and the post-grant period. The data of tables 2 and 3 show two clear trends in the collection of water fees: *1)* small and medium size municipalities (up to 100,000 inhabitants) with low and medium levels of welfare (groups 1 to 5) reduced their collection of water fess after the introduction of the *FAISM*, and 2) big municipalities (from 100,000 to more than 1 million inhabitants) with high levels of welfare (groups 6 and 7) increased their collection in the post-grant period. These trends are particularly visible in the categories of municipalities with the lowest and the highest levels of welfare. In the first case, the group of municipalities with a level of development of 1 dropped their collection of water fees by almost 120 percent, while the municipalities with a level of development of 7 increased their collection of water fees by 30 percent after the creation of the *FAISM*.

These differences in the collection of fees by the different groups of municipalities are due to the same reasons that explain their asymmetric response to the collection of the property taxes. However, the variability between the pre and the post-grant period is greater with water fees than with property taxes. This fact raises two observations: *1)* small municipalities have high margins of discretion to charge for the consumption of water. Because of the patronage system that dominates the societal relations of many rural and semi-rural localities in Puebla, many municipalities report a zero collection of water fees, and *2)* big municipalities have a high leverage to increase the collection of water fees. This increase comes both from

[49] I was not able to verify this information.

[50] On September 1999 the Federal Constitution was reformed and according to the Fifth Transitory Article, before the beginning of the fiscal year 2000, municipalities, in coordination with the local legislatures, must equalize the actual property values of their municipalities with the appropriate commercial values. Unsurprisingly, most municipalities of the country have not been able to make this actualization.

[51] In year 2000 this minimum payment was equivalent to $6 U.S. ($62 pesos) per property per year. These payments are yearly updated by the state legislature, but mainly just to adjust for inflation and not to make real increases.

an update in the prices of water and from charging users that did not pay for water consumption in the past.[52]

5. Conclusions

The overall findings of this paper can be summarized in two main conclusions. First, as expected both by academics and government officials, Mexican municipalities have reduced their tax effort since the creation of the *FAISM*. This result provides evidence in support of the 'rational model' according to which central-government's transfers are used to reduce local taxes and user charges (Peterson 1997). Second, this study finds that the 'rational model' does not fully explain the tax effort behavior of all the categories of municipalities. Specifically, while the *FAISM* negatively affects the tax effort of the small and medium size municipalities with low and medium levels of welfare, the big and developed municipalities do not reduce their tax effort.

The results of this paper are significant for two reasons. First, they expose the realities of fiscal decentralization which has been subject to strong beliefs about its inherent virtues, without empirical evidence. Second, this paper shows that different categories of municipalities react differently to the same policy. It is misleading to treat municipalities as a single homogeneous group —as most studies of Mexican municipalities do— without recognizing their different structural and institutional capacities. This lack of recognition of municipal diversity is perhaps the first step towards policy failure.

Despite the significance of this study, there are some limitations to the validity of the results of this paper that should be acknowledged. Two general critiques to this type of study relate to the problems of temporality and multi-causality.[53] The first problem arises because the *FAISM* has been in place for too little time to draw solid conclusions about its effects. However, even if the time span of the analysis is indeed short, it is better to have preliminary results, than not have any at all.

The second problem refers to the fact that the results of this investigation might be generated by multiple causes. Throughout the paper I assume that all the variation in tax collection from the pre to the post-grant period was caused by the introduction of the *FAISM*; however, there are strong reasons to believe that this is not necessarily the case. Municipalities face structural constraints, local inertias, and

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[52] In Puebla, the state government is not directly in charge of the management of the water system. This is done by an institution called "Organizations for the Management of Water Management" that annually proposes the prices of water to the state Legislature who is the responsible for their approval. As in the case of the property tax, most municipalities have an agreement of administrative collaboration with the state government; however, municipalities are responsible for the actual charge of the fees.

[53] These two critiques came out a few times during interviews that I conducted with academics in Mexico.

even political strategies that also determine their levels of revenue collection. In this sense, the results of this paper do not only show changes in the willingness to collect taxes, but also captures the differing capacities of municipalities to do so.

Moreover, this mono-causal explanation makes the strong assumption that local governments behave like perfectly informed rational actors that readily adjust their financial policies to maximize their benefits and minimized their costs (by substituting own-source revenues with grants). However, in reality municipalities – at least rural and semi-urban ones, like most of Puebla's– neither have full information about their different sources of revenues nor have the planning capacity to behave like rational actors.

A more substantive critique to this study comes from the inherent limitations of the concept of 'tax effort'. The normative literature on fiscal decentralization prescribes that in order to be accountable, local governments should finance their budgets to the extent possible with own-source revenues rather than with transfers. However, enforcing accountability at the local level is a complex issue that requires an overreaching analysis of the local and intergovernmental institutions in addition to studying the financial sources of local governments (Litvack *et al.* 1998: 10).[54]

Following this institutional perspective, Bird and Villancourt (1998) have proposed to go beyond the consideration of the proportion of own-source revenues to intergovernmental grants and to analyze more carefully the extent to which local governments control their own-source revenues. Their proposal argues that in order for the concepts of local accountability and responsiveness to make sense, municipalities should have a certain degree of 'control' over their own-source revenues, particularly over their tax bases and rates. This proposal has important implications for the case of Mexico where municipalities –as in most developing countries– do not have control over their tax bases or rates. These implications are clearly stated in a study of the World Bank that deserves to be quoted at length (1995 :18):

> Undoubtedly, the most important characteristic of a local tax is the freedom of the local government to determine the tax rate. Local governments may have large receipts from what appear to be local taxes, but if, as in the case of the municipal property tax, they can neither set the tax rate nor determine the tax base, it is difficult to see how they can be accountable to their constituents at the margin, as both democracy and efficiency require. Unless local governments have some degree of freedom to alter the level and composition of their revenues, neither 'local autonomy' nor local accountability are meaningful concepts. In particular, rate flexibility is essential if a tax is to be adequately responsive to local needs and decisions

The last and more general conclusion of this study is that Mexico has yet to define its decentralization strategy. This is illustrated by the fact that the *FAISM*, which

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[54] See for example: A. Shah, "Fostering fiscally responsive and accountable governance: lessons form decentralization" in R. Piccioto and E. Wiesner (1998) and Ch. Garman *et al.* (2001).

represents the most aggressive step towards fiscal decentralization in Mexico, was designed without any consideration of the institutional capacities of the recipient municipalities to manage more financial resources. The rapid decentralization of spending decisions has not yet been accompanied by the creation of adequate institutions (Webb in Giugale *et al.* 2001: 709). The need for appropriate monitoring, coordinating and regulating mechanisms is imperative in a time when municipalities are increasingly becoming the driving forces of infrastructure and development in Mexico.

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Appendix 1

Table 1
Central, state and local revenue and spending as percentage of total revenue and spending in some OECD and Latin American countries
(Average 1980-1996)

	REVENUE			EXPENDITURE		
	Central	*State*	*Local*	*Central*	*State*	*Local*
MEXICO	80.1	17.0	2.9	77.3	19.7	3.0
OECD	67.4	20.2	12.4	60.8	24.5	14.7
L. AMERICA	73.1	22.7	4.2	65.9	26.1	8.0

The group of OECD countries are: Germany, Australia, Austria, Canada, Spain and the United States. The group of Latin American countries are: Argentina, Brazil and Colombia. All these countries except Spain and Colombia are federations. The selection of these countries was based on the criterion of information availability.

These figures are my own calculations according to data of the following sources: IMF, *Government Finance Statistics Yearbook*; INEGI, *El ingreso y el gasto publico en* México; Porto and Sanguinetti, *Descentralización fiscal en América Latina: el caso argentino* (Chile: Naciones Unidas. Serie: Política Fiscal, 45); Rodrigues, *Descentralización fiscal en América Latina: el caso de Brasil* (Chile: Naciones Unidas. Serie: Política Fiscal, 61).

Table 2
Percentage of own-source revenues, revenue-sharings and other revenues out of total municipal revenues of states and municipalities in Mexico

Year	Shares (States)	Own-source (States)	Other (States)	Shares (Municipalities)	Own-source (Municipalities)	Other (Municipalities)
1982	46.8	21.2	32.0	45.8	43.2	11.0
1983	52.9	16.7	30.4	64.4	30.8	4.8
1984	52.2	15.2	32.6	59.1	30.6	10.3
1985	49.1	15.8	35.1	57.1	34.3	8.6
1986	52.2	18.3	29.5	59.4	32.8	7.8
1987	52.1	14.5	33.4	57.3	33.0	9.7
1988	61.0	10.7	28.3	58.1	31.8	10.1
1989	49.0	8.8	42.2	51.0	36.9	12.1
1990	59.9	12.2	27.9	48.1	37.7	14.2
1991	59.2	13.3	27.5	47.1	40.0	12.9
1992	48.7	17.3	34.0	47.9	40.9	11.2
1993	43.8	22.8	33.4	44.4	39.2	16.4
1994	38.2	29.8	32.0	46.9	37.6	15.5
1995	37.5	9.3	53.2	49.1	35.4	15.5
1996	43.0	7.6	49.4	53.3	30.7	16.0
Average	49.7	15.6	34.7	52.6	35.7	11.7

Own calculations based on: INEGI, *El ingreso y el gasto público en México*, several editions. The aggregate called 'own-source ' is composed of taxes, '*derechos*', '*productos*' and '*aprovechamientos*'. The accounts that form the aggregate 'other ' are the revenues that municipalities get through public debt and other non-ordinary revenues. The Federal District is excluded from the calculations.

Appendix 2

Table 1
Distribution of the municipalities of the state of Puebla by population size

Population size	Frequency	Population	Min	Max	St. Dev.	Percentage of Total
0-2,500	22	29,398	419	2,358	571	0.64
2,500-15,000	127	945,631	2,523	14,803	3,381	20.45
15,000-100,000	64	2,012,082	15,047	89,782	17,546	43.51
100,000-1,000,000	3	414,685	111,737	190,468	45,242	8.97
1,000,000	1	1,222,569				26.43
Total	217	4,624,365				100

Own calculations

Table 2
Distribution of the municipalities of the state of Puebla by level of welfare

Welfare*	Frequency	Population	Min	Max	St. Dev.	Percentage of Total
1	38	423,592	2,012	39,866	7,060	9.10
2	39	236,697	697	26,114	5,259	5.19
3	56	715,938	616	45,546	10,934	15.48
4	7	345,614	36,660	62,788	8,820	7.47
5	62	688,418	419	46,208	9,307	14.89
6	5	262,418	18,761	75,169	23,604	5.67
7	10	1,952,090	13,741	1,222,569	364,388	42.2
Total	217	4,624,365				100

Own calculations
* In this index 1 stands for the lowest level of welfare and 7 for the highest

List of variables used to construct INEGI's index of municipal welfare

1) Percentage of population under 15 years old
2) Percentage of residents born in another state
3) Percentage of population 5 years or older whom lived in another state in 1995
4) Percentage of population between 6 and 14 years old that know how to read and write
5) Percentage of population of 15 years and older that know how to read and write
6) Percentage of population between the age of 6 and 11 that attends school
7) Percentage of population between the age of 12 and 14 that attends school
8) Percentage of population between the age of 15 and 19 that attends school
9) School level average
10) Average number of children of mothers 12 years or older.
11) Average number of children of mothers between 12 and 19 years old
12) Average number of children of mothers between 12 and 29 years old
13) Percentage of population economically active
14) Percentage of population employed in public service
15) Percentage of population employed in trade and commerce
16) Percentage of population employed that works less than 24 hours per week
17) Percentage of residencies with dirt floors
18) Rooms per residence
19) Percentage of residencies with drainage
20) Percentage of residencies with water
21) Percentage of residencies with electricity
22) Dependency factor
23) Percentage of population that is rural
24) Percentage of population that is urban
25) Percentage of population with an education beyond elementary school
26) Percentage of population employed in the primary sector
27) Percentage of population employed in the third sector
28) Percentage of population employed that works less then 33 hours per week
29) Percentage of residencies with one room
30) Percentage of residencies that use coal or wood to cook
31) Ratio of kids deceased whose mothers are between the ages of 20 and 29
32) Percentage of population without rights
33) Percentage of population employed by their families without pay
34) Percentage of residencies without a private bathroom
35) Percentage of residencies without a refrigerator
36) Percentage of residencies without a television

Appendix 3

This appendix presents the collection of property tax, water fess and total own-source revenues (addition of the collections of property tax and water fees) from 1993 to 2000. The information is presented in nominal (N stands for nominal) and in real terms (R stands for real) for all the municipalities together and by categories of population sizes and levels of welfare.

All municipalities	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	36,240,612	58,914,521	78,014,155	82,371,992	102,513,256	117,877,326	163,436,850	161,625,079
Water fees (N)	37,443,999	72,487,561	71,017,928	99,208,102	134,349,764	152,089,010	208,828,000	221,594,070
Own-source (N)	73,684,611	131,402,082	149,032,084	181,580,094	236,863,020	269,966,336	372,264,850	383,219,149
Property tax (R)	38,968,400	58,914,521	57,788,263	45,509,388	47,024,429	46,591,829	55,402,322	50,038,724
Water fees (R)	40,262,365	72,487,561	52,605,873	54,811,106	61,628,332	60,114,233	70,789,153	68,604,975
Own-source (R)	79,230,764	131,402,082	110,394,136	100,320,494	108,652,761	106,706,062	126,191,475	118,643,699

0-2,500	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	165,703	261,233	269,985	290,394	421,267	373,819	625,378	497,853
Water fees (N)	173,257	349,991	265,802	321,153	365,650	454,647	578,647	540,598
Own-source (N)	338,961	611,223	535,787	611,547	786,917	828,466	1,204,025	1,038,451
Property tax (R)	178,176	261,233	199,989	160,439	193,242	147,755	211,992	154,134
Water fees (R)	186,298	349,991	196,890	177,433	167,729	179,702	196,152	167,368
Own-source (R)	364,474	611,223	396,879	337,871	360,971	327,457	408,144	321,502

2,500-15,000	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	2,661,903	3,765,849	4,887,620	6,090,512	7,275,870	7,144,409	10,590,524	9,794,598
Water fees (N)	2,830,051	4,809,520	4,725,876	5,054,717	6,132,501	6,700,980	7,125,449	8,141,604
Own-source (N)	5,491,954	8,575,370	9,613,496	11,145,229	13,408,371	13,845,389	17,715,973	17,936,202
Property tax (R)	2,862,261	3,765,849	3,620,459	3,364,924	3,337,555	2,823,877	3,590,008	3,032,383
Water fees (R)	3,043,065	4,809,520	3,500,649	2,792,661	2,813,074	2,648,609	2,415,406	2,520,621
Own-source (R)	5,905,326	8,575,370	7,121,108	6,157,585	6,150,629	5,472,486	6,005,415	5,553,004

15,000-100,000	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	8,694,231	13,915,697	16,469,193	19,342,018	24,946,078	26,162,336	39,972,599	36,068,364
Water fees (N)	9,211,086	13,071,680	11,926,858	17,056,898	22,698,152	21,808,498	25,488,640	27,891,383
Own-source (N)	17,905,317	26,987,377	28,396,051	36,398,915	47,644,230	47,970,834	65,461,238	63,959,747
Property tax (R)	9,348,635	13,915,697	12,199,402	10,686,198	11,443,155	10,340,844	13,550,033	11,166,676
Water fees (R)	9,904,393	13,071,680	8,834,710	9,423,700	10,411,996	8,619,960	8,640,217	8,635,103
Own-source (R)	19,253,029	26,987,377	21,034,112	20,109,898	21,855,151	18,960,804	22,190,250	19,801,779

100,000-1,000,000	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	2,658,871	5,754,048	7,970,838	8,838,514	12,158,318	14,771,410	24,292,923	18,767,988
Water fees (N)	4,683,699	9,830,065	10,480,462	11,159,798	15,810,800	16,560,438	23,545,681	25,215,468
Own-source (N)	7,342,569	15,584,114	18,451,300	19,998,312	27,969,117	31,331,848	47,838,604	43,983,456
Property tax (R)	2,859,001	5,754,048	5,904,324	4,883,157	5,577,210	5,838,502	8,234,889	5,810,523
Water fees (R)	5,036,235	9,830,065	7,763,305	6,165,634	7,252,660	6,545,628	7,981,587	7,806,646
Own-source (R)	7,895,236	15,584,114	13,667,630	11,048,791	12,829,870	12,384,130	16,216,476	13,617,169

1,000,000- +	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	22,059,904	35,217,693	48,416,519	47,810,555	57,711,723	69,425,352	87,955,426	96,496,276
Water fees (N)	20,545,906	44,426,305	43,618,930	65,615,536	89,342,661	106,564,448	152,089,584	159,805,016
Own-source (N)	42,605,810	79,643,998	92,035,449	113,426,091	147,054,384	175,989,800	240,045,010	256,301,292
Property tax (R)	23,720,327	35,217,693	35,864,088	26,414,671	26,473,268	27,440,851	29,815,399	29,875,008
Water fees (R)	22,092,372	44,426,305	32,310,319	36,251,677	40,982,872	42,120,335	51,555,791	49,475,237
Own-source (R)	45,812,699	79,643,998	68,174,407	62,666,349	67,456,140	69,561,186	81,371,190	79,350,245

Level of welfare 1	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	827,973	1,397,093	1,810,340	1,653,944	2,197,428	1,847,095	2,803,631	2,635,268
Water fees (N)	158,914	341,762	255,907	217,255	278,158	239,875	227,733	281,757
Own-source (N)	986,887	1,738,855	2,066,248	1,871,199	2,475,585	2,086,970	3,031,363	2,917,025
Property tax (R)	890,293	1,397,093	1,340,993	913,781	1,007,994	730,077	950,383	815,873
Water fees (R)	170,875	341,762	189,561	120,030	127,595	94,812	77,197	87,231
Own-source (R)	1,061,168	1,738,855	1,530,554	1,033,812	1,135,590	824,889	1,027,581	903,104

Level of welfare 2	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	482,261	703,227	833,635	996,497	1,301,841	1,296,794	2,170,439	1,854,642
Water fees (N)	343,513	890,402	823,399	861,259	1,140,181	1,186,858	1,084,621	1,529,101
Own-source (N)	825,774	1,593,629	1,657,033	1,857,756	2,442,022	2,483,651	3,255,060	3,383,744
Property tax (R)	518,560	703,227	617,507	550,551	597,175	512,567	735,742	574,193
Water fees (R)	369,369	890,402	609,925	475,834	523,019	469,114	367,668	473,406
Own-source (R)	887,929	1,593,629	1,227,432	1,026,384	1,120,194	981,680	1,103,410	1,047,599

Level of welfare 3	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	2,159,649	3,619,612	3,950,787	5,040,486	6,192,620	6,224,570	8,878,046	8,339,255
Water fees (N)	3,003,737	3,305,758	3,265,110	3,880,496	4,552,831	4,197,810	4,097,108	3,326,402
Own-source (N)	5,163,386	6,925,369	7,215,897	8,920,982	10,745,452	10,422,380	12,975,154	11,665,657
Property tax (R)	2,322,204	3,619,612	2,926,509	2,784,799	2,840,651	2,460,305	3,009,507	2,581,813
Water fees (R)	3,229,824	3,305,758	2,418,600	2,143,921	2,088,455	1,659,213	1,388,850	1,029,846
Own-source (R)	5,552,028	6,925,369	5,345,109	4,928,720	4,929,106	4,119,518	4,398,357	3,611,658

Level of welfare 4	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	1,324,873	1,933,354	2,338,577	2,752,643	3,906,107	3,626,338	6,939,738	5,930,315
Water fees (N)	1,837,348	3,066,868	3,062,064	4,478,121	5,737,740	5,226,152	4,819,184	6,064,917
Own-source (N)	3,162,221	5,000,223	5,400,641	7,230,764	9,643,847	8,852,490	11,758,922	11,995,232
Property tax (R)	1,424,595	1,933,354	1,732,279	1,520,797	1,791,792	1,433,335	2,352,454	1,836,011
Water fees (R)	1,975,643	3,066,868	2,268,195	2,474,100	2,631,991	2,065,673	1,633,622	1,877,683
Own-source (R)	3,400,238	5,000,223	4,000,475	3,994,897	4,423,783	3,499,008	3,986,075	3,713,694

Level of welfare 5	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	2,328,546	3,290,546	3,930,020	5,111,113	6,729,154	6,714,981	11,176,848	9,829,810
Water fees (N)	3,029,570	6,082,287	4,999,393	6,266,219	8,031,791	8,199,735	9,115,150	10,569,880
Own-source (N)	5,358,116	9,372,833	8,929,413	11,377,332	14,760,945	14,914,716	20,291,998	20,399,691
Property tax (R)	2,503,813	3,290,546	2,911,126	2,823,820	3,086,768	2,654,143	3,788,762	3,043,285
Water fees (R)	3,257,603	6,082,287	3,703,254	3,461,999	3,684,308	3,241,002	3,089,881	3,272,409
Own-source (R)	5,761,415	9,372,833	6,614,380	6,285,819	6,771,076	5,895,145	6,878,643	6,315,694

Level of welfare 6	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	1,503,953	1,846,508	2,172,779	2,332,345	3,401,613	3,333,913	4,003,618	4,579,391
Water fees (N)	1,676,029	2,108,798	1,960,470	3,271,844	4,458,703	4,614,081	7,780,823	6,887,806
Own-source (N)	3,179,982	3,955,306	4,133,250	5,604,189	7,860,317	7,947,994	11,784,441	11,467,198
Property tax (R)	1,617,153	1,846,508	1,609,466	1,288,588	1,560,373	1,317,752	1,357,159	1,417,768
Water fees (R)	1,802,182	2,108,798	1,452,200	1,807,649	2,045,277	1,823,747	2,637,567	2,132,448
Own-source (R)	3,419,335	3,955,306	3,061,666	3,096,237	3,605,650	3,141,499	3,994,726	3,550,216

Level of welfare 7	1993	1994	1995	1996	1997	1998	1999	2000
Property tax (N)	27,613,358	46,124,180	62,978,016	64,484,964	78,784,493	94,833,636	127,464,529	128,456,397
Water fees (N)	27,394,888	56,691,687	56,651,586	80,232,908	110,150,359	128,424,500	181,703,382	192,934,207
Own-source (N)	55,008,246	102,815,867	119,629,602	144,717,871	188,934,852	223,258,135	309,167,912	321,390,603
Property tax (R)	29,691,782	46,124,180	46,650,383	35,627,052	36,139,676	37,483,651	43,208,315	39,769,782
Water fees (R)	29,456,869	56,691,687	41,964,137	44,327,573	50,527,688	50,760,672	61,594,367	59,731,952
Own-source (R)	59,148,651	102,815,867	88,614,520	79,954,625	86,667,363	88,244,322	104,802,682	99,501,735