Fiscal Federalism, Good Governance, And Economic Growth in Mexico

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1. Introduction

Good governance and appropriately designed institutions are now recognized as necessary for economic growth. Yet we know too little about this relationship. Why do some governments protect property rights, provide a stable macroeconomy, and have limited taxes and corruption, while others are corrupt kleptocracies that prey on their citizens?

In recent years, a new political economy literature has emerged that studies these questions by investigating the interaction of political institutions and economic performance.¹ Proponents of this approach provide a general if abstract answer to the above questions: A country’s political and institutional framework determines whether government officials face incentives for good or bad governance. As Stiglitz (1998,5) suggests, “misaligned incentives can induce government officials to take actions that are not, in any sense, in the public interest.”

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Unfortunately, too little is known about how institutions systematically affect the incentives of government officials and what types of institutions lead to good governance and better economic performance.

We add to this new literature by exploring questions of governance and growth in the context of the global trend toward greater decentralization, particularly within developing countries. A long tradition in economics emphasizes the advantages of federalism for good governance. More recently, proponents of market-preserving federalism suggest that an appropriately structured decentralization fosters economic development. Yet recent theory and evidence cast doubt on the assertion that decentralization promotes political and economic development. Many scholars suggest that federalism leads to more inflation or corruption; others emphasize that spillovers, common pool problems, and problems from soft budget constraints result in efficiency losses associated with decentralization.

Following Shah (1997) our approach helps explain this puzzle about federalism by suggesting that there is not one kind of decentralization. Federal systems differ enormously in the ways they allocate money, power, and authority across levels of government. Some federal arrangements are therefore likely to foster corruption and inefficiency while others foster economic growth.

We explore how variations in two institutional features – the fiscal system and electoral competitiveness – affect subnational government (SNG) performance. In particular, we study how variations in the distribution of locally raised taxes and increases in electoral


\[2 \text{For the long-standing economists’ argument, see Hayek (1939) and Tiebout (1956); for modern reviews, see Rubinfeld (1987) and McKinnon and Nechyba (1997). On market-preserving federalism, see McKinnon (1997), Montinola, Qian, and Weingast (1995), Weingast (1995) and Zhuravskaya (2000).}\]
competitiveness affect SNG choices. In our model, an SNG allocates its resources across two categories of policies: public goods that foster markets; and the public provision of private benefits, such as corruption and subsidies to interest groups, that hinder markets. Subject to its budget constraint, the SNG chooses between the two activities to maximize its utility, which is positively related to each type of policy. We define good governance as the provision by SNGs of market-enhancing public goods instead of non-productive transfers and corruption. Good governance is therefore endogenous.

We analyze two comparative statics. The first concerns $\alpha$, the proportion of locally generated taxes captured by the SNG: ceteris paribus, an increase in $\alpha$ increases good governance. The reason is that choosing public goods has two benefits: directly, it provides citizens with utility; indirectly it increases tax revenue and so relaxes the SNG’s budget constraint. In contrast, corruption and non-productive transfers benefit only those citizens receiving the rents.

The second comparative static concerns the degree of electoral competition. Ceteris paribus, electoral competition increases good governance. Although officials in all SNGs need political support to survive, those in an SNG that faces competition must appeal to the median voter whereas those in noncompetitive SNGs do not need as strong appeals to voters.

Our first comparative statics result has an important implication for revenue sharing systems that we call the fiscal law of $1/n$: in a federation of $n$ SNGs, where the central government collects and distributes all tax revenue (i.e. $\alpha = 0$), the indirect benefit for an SNG of fostering markets is on the order of $1/n$ that of a fiscal system in which SNGs are 100% financed through locally generated revenue (i.e. $\alpha = 1$) (see Inman 1988 and Weingast, Shepsle and

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3 See, e.g., Dillinger and Webb (1999), Garman, Haggard and Willis (2000), Hzou (1998), Inman and
Johnsen 1981). The reason is that revenue sharing creates a common pool problem. Under complete revenue sharing, an SNG bears all the costs of providing a public good, but captures only 1/nth of the revenue benefits. The rest of the benefits are spread across other jurisdictions through the central government’s division of the common pool. Therefore complete revenue sharing systems greatly diminish a SNG’s incentives to provide market-fostering public goods. We call revenue sharing agreements in which SNGs give up their policy and fiscal autonomy fiscal pacts with the devil (FPWD) because they increase corruption, provide fewer public goods that enhance growth, and diminish citizen welfare.

We apply our approach to federalism in Mexico. Although 20th century Mexico has always had a federal structure, the distribution of authority and fiscal resources among the levels of government (and therefore $\alpha$) has changed over time. We identify four phases. During the first period, from the Revolution (1910-1917) to 1940, the central government was unable to enforce parts of the Constitution, allowing a variety of standard common pool problems. In the second period, 1940-80, the center became stronger and policed common pool problems. Indeed, early in this period, Mexico was characterized by market-preserving federalism, a type of federalism associated with economic growth (Weingast 1995). Yet Mexico continued to centralize, coaxing the states to join a revenue sharing system. By 1980, Mexico was highly centralized, largely federal in name only. After the government achieved centralization, Mexico was characterized by the fiscal law of 1/n, producing efficiency losses. Of course the debt crisis and the collapse of oil prices also affected growth during this period. Finally, since 1994, Mexico has undergone some decentralization and liberalization. After 1994, both $\alpha$ and the degree of electoral competition increased. For this reason, Mexico offers a natural experiment of the isolated effects

of $\alpha$ over good governance (until the late 1980s), and then of the combined effects of $\alpha$ and political competition (since 1994).

Consistent with our theory about federalism and good governance, Mexico’s pattern of growth corresponds to these phases.\(^4\) In the first, real GDP growth was slow, averaging 1.4 percent per year. In the second, often called the “Mexican Miracle,” Mexico sustained four decades of rapid growth, 6.8 percent per year. In the third, growth slowed considerably to just 2.3 percent per year. In the last period, 1994-present, growth has improved somewhat: real GDP fell over 6 percent during the peso crisis (late 1994 and 1995), but then has grown at an average of 5.1 percent per year (1996-99).

We provide several types of evidence supporting our predictions for the case of Mexico. First, with respect to the differential willingness of states to join a fiscal pact that limits their ability to tax, our approach predicts that the more market-oriented states should be less likely to participate. We show that this holds in practice. Second, the theory predicts several changes in the behavior of SNG governance after they join the FPWD. Decreases in $\alpha$ should lead SNGs to spend more on rents and less on public goods. We provide some evidence of the changes in the patterns of expenditure after states joined the pact. The fiscal law of $1/n$ combines with the common pool problem created by revenue sharing to predict that state taxes should fall and total federal taxes should increase following the 1980 change in the fiscal system. We show that this happened.

Third, we calculate $\alpha$ implied by the various revenue sharing formulas used since 1980. The initial formula, made explicit in 1980 but employed previously, returned to states exactly what they contributed. Because the federal government also spent considerable sums in the states

\(^4\)The quality of data from the early periods is poor, so these figures must be treated as approximate.
at this time, we calculate that $\alpha$ was on the order of .2. We also show that the current formula, dating from 1995, has somewhat better properties, allowing states to receive on the order of one-quarter of any increase in revenue generated in their state. We calculate that our model’s $\alpha$ in contemporary Mexico as .233. Fourth, the theory predicts that SNGs which face electoral competition have a stronger preference for providing public goods over rents. We provide evidence of good governance in municipalities that have become electorally competitive.

Finally with respect to good governance and economic growth, we argue that increases in $\alpha$ and in electoral competition lead to better governance. We present evidence of the change in the rates of growth in Mexico as $\alpha$ and electoral competitiveness change.

Our approach contrasts with two normative rationales for federal revenue sharing. First, the traditional normative public finance perspective, relying on the assumption of a benevolent government that maximizes citizen welfare, argues that the federal revenue sharing allows the government to redistribute income, which a decentralized set of SNGs could not achieve on their own. Second, Persson and Tabellini (1993) argue that revenue sharing in federal systems provides a degree of social insurance against regional shocks. From a normative perspective, neither approach can be criticized. From a positive perspective, particularly in the developing world, these rationales often fail. Mexico’s widespread corruption, its many anti-development policies, and the long-term diversion of public resources to maintain the party in power all question relevance of the benevolent government assumption. As we will show, Mexico’s initial revenue sharing scheme involved little redistribution and no social insurance: states received back from the center in proportion to their contributions. Although the Mexican system now contains some redistribution, it is a small portion of the total revenue shared with the states. Put
simply, the normative rationales cannot explain why Mexico pursued fiscal centralization and revenue sharing.

An alternative hypothesis, more consistent with the facts in many developing countries, is twofold. First, revenue sharing qua FPWD allows the federal government to achieve a monopoly on taxes. The tax monopoly allows them to extract more revenue from citizens than can the SNGs in the aggregate. Capital and labor mobility, even if imperfect, limits the ability of SNGs to extract taxes from their citizens and firms. The federal government, with its monopoly on taxes, does not face this limit. Second, Mexican politicians used these funds to keep their dominant party in power for decades. Diaz-Cayeros, Magaloni, and Weingast (2000), for example, show that the dominant party used its control over fiscal resources to punish those areas that elected the opposition by withdrawing funds.

Our approach has implications for the larger question about the political foundations of good government. Appropriately structured federalism helps improve the incentives for resource allocation, particularly when corruption throughout and bad central government economic policies represent major problems hindering economic performance. Appropriately structured federalism decentralizes a range of decisions, taking a series of allocation decisions away from the federal government. This can have efficiency gains when the federal government is a major source of inefficient policy (Jin, Qian, and Weingast 1999; see also Brennan and Buchanan 1980). The key to capturing efficiency gains through decentralization, however, is getting the incentives for local government officials right.

The paper proceeds as follows. Section 2 develops our theoretical framework. Sections 3 and 4 derive, respectively, the effects that revenue sharing and political competition have over good governance. Section 5 provides the background on federalism and electoral
competitiveness in Mexico in Mexico. Section 6 provides evidence supporting our approach from the Mexican fiscal system, including the application of the fiscal law of 1/n, and provides evidence to support the theory’s predictions. Our conclusions follow.

2. A Model of SNG Choice under Revenue Sharing

We begin by analyzing how fiscal incentives affect a subnational government’s (SNG) decision making. We assume that government officials, whether elected or not, seek to advance their careers by remaining in office or, if they are part of a strong national party system, by enhancing their party’s local reputation. Government officials pursue these career goals by attempting to generate political support. Democratically elected representatives must maintain the support of a majority of voters. For authoritarians, the percentage required to retain their office is undoubtedly lower than a majority, though it is also substantial portion of the population.5

We assume that government officials have two separate means of fostering political support. First, they may engage in corruption and provide politically generated rents to constituents. These rents may take a variety of forms, such as corrupt payments or various benefits derived from market intervention (e.g., local monopolies or anti-competitive regulations). Second, government officials may provide public goods that foster local economic growth, providing indirect benefits to constituents.

5 Students of comparative politics again and again emphasize the need of authoritarian governments to maintain sufficient support to remain in power. See for example Geddes 1999, Przeworski and Limongy 1997, Poole and Londregan 1996.
In what follows, we study how various fiscal arrangements affect political officials’ tradeoff between pursuing rents and providing public goods. Assume that each of \( N \) (subnational) governments seeks to maximize the following utility function,

\[
U_i = U_i(r, y),
\]

where \( r \) represents the level of corruption and rents and \( y \) is the level of the (market-fostering) public good. The utility function is that of a representative constituent. For democratic local governments, the utility function is that of the median voter. By maximizing the median voter’s utility function, the SNG assures enough support to survive. As noted, hegemonic SNGs also need to retain political support, though less support than those which face electoral competition, so we assume that these governments also have a representative constituent.

For simplicity, we drop the subscript \( i \). We assume that \( U(r, y) \) is increasing but at a decreasing rate in each variable; that is, \( U_r > 0, U_{rr} < 0, U_y > 0, U_{yy} < 0 \). We will also assume that \( U_{ry} \geq 0 \), indicating that the two means of providing political support do not interfere with one another, if at all, they actually help one another.

We also assume that the SNG faces a budget constraint. Its budget, \( B \), is given by

\[
B = T + \alpha \tau(y),
\]

where \( T = T(\theta, \tau(y)) \) represents the amount of fiscal transfers from the national government; \( \tau(y) \) is the locally generated taxes as a function of the level of public good provided; and \( \alpha \) is the proportion of locally generated taxes that the SNG may keep (\( 0 \leq \alpha \leq 1 \)). The public good, \( y \), is assumed to affect positively the locally generated taxes; that is, \( \tau_y > 0.6 \).

Finally, we have the SNG’s budget constraint, which allows the SNG to spend its budget on \( r \) and \( y \):
\[ r + ay \leq B \]  

where \( a \) is the parameter representing the relative cost of a unit of \( y \) in terms of \( r \) (we normalize the price of \( r \) to 1). Substituting for \( B \) and rearranging terms yields \( r = T + \alpha \tau(y) - ay \).

To study the government’s behavior, we use expression (2) for \( r \) and substitute back into (1). This yields the following maximization problem:

\[
\text{Max}_y \quad U(T + \alpha \tau(y) - ay, y),
\]

with first order conditions:

\[
U_r(\alpha \tau' - a) + U_y = 0.
\]

The first order conditions imply that the government’s marginal rate of substitution between \( r \) and \( y \), \( U_r / U_y \), is given by:

\[
\frac{U_r}{U_y} = \frac{1}{(\alpha \tau' - a)}.
\]

To interpret the first order conditions, suppose that \( y \) had no effect on taxes; i.e., \( \tau' = 0 \). Then we would obtain the standard result that at the optimum choice of \( r \) and \( y \) the marginal rate of substitution between \( S_r \) and \( S_y \) equals minus the ratio of the cost of \( r \) to the cost of \( y \); that is,

\[
\frac{U_r}{U_y} = -\frac{1}{a}.
\]

In our problem, \( y \) affects the taxes, and hence the term in equation (5), \( \alpha \tau' \), which adjusts the marginal rate of substitution. Intuitively, the adjustment term reflects \( y \)'s positive effect on the budget, which leads the SNG to choose more \( y \) than otherwise. The specific amount of the adjustment in the marginal rate of substitution is given by \( \alpha \tau' \).

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6 Perhaps a more accurate formulation follows Haughwout and Inman (2000a,b) and lets the size of the local economy, \( \tau(y, r, \tau) \) be positively related to \( y \) and negatively related to \( r \) and \( \tau \), so that locally raised revenue is \( \tau \tau(y, r, \tau) \). As the results are qualitatively similar, we use the simpler formulation.
To assure we have a maximum, we investigate the second order conditions. Under the assumption that \( \partial^2 S / \partial r \partial y > 0 \), these conditions hold. This ensures that an equilibrium exists and is characterized by a point.

We now turn to our principal question about how the SNG’s behavior changes in response to the fiscal system. To begin, we investigate how a shift in \( \alpha \) affects the SNG’s choice of \( r \) and \( y \). To do this, we derive the comparative statics results of \( \alpha \) on \((r^*, y^*)\), the SNG’s optimal choice of \( r \) and \( y \). We start with \( y^* \). The first order conditions (4) give \( y^* \) as an implicit function of the exogenous parameters \((a, \alpha, t)\). By the implicit function theorem, we have for any exogenous parameter, \( x_i \), that:

\[
\frac{\partial y}{\partial x_i} = -\frac{\frac{\partial F}{\partial x_i}}{\frac{\partial F}{\partial y}},
\]

where \( F \) is the left hand side of the first order conditions (4).

To simplify, we know from the second order conditions that the denominator of (6) is negative for all \( x_i \). Thus, to sign \( (\partial y / \partial x_i) \), we have to sign the numerator; that is, sign \( (\partial y / \partial x_i) \)

\( = \) sign \( (\partial F / \partial x_i) \). To calculate the effect of \( \alpha \) on \( y^* \), we differentiate (4) with respect to \( \alpha \).

Given our assumptions, is positive. *So increasing \( \alpha \), the SNG’s share of locally generated taxes has the effect of increasing the SNG’s optimal level of \( y^* \).*

The effect of \( \alpha \) on \( r^* \) is more complicated. To calculate this, we first observe that the budget constraint yields \( r^* = B(t, \tau(y, \alpha)) - ay^* \). Totally differentiating this equation and setting the other exogenous changes to 0 yields the following:

\[
\frac{\partial r^*}{\partial \alpha} = (B_t \tau_y - a) \frac{\partial y^*}{\partial \alpha} + B_t \tau_a.
\]
Equation (7) has an interesting interpretation. First, since the first term on the right hand side is negative and the second term is positive, \( \frac{\partial r^*}{\partial \alpha} \) can either be positive or negative. Second, the response of \( r^* \) to an increase in \( \alpha \) is negatively related to the \( \frac{\partial y^*}{\partial \alpha} \). That is, the larger is the effect of \( \alpha \) on \( y^* \), the smaller is \( \frac{\partial r^*}{\partial \alpha} \).

In sum, increasing \( \alpha \), the proportion of locally generated taxes retained by the SNG, increases the resources the SNG devotes to the market-fostering public good, \( y \). The reason is straightforward: producing \( y \) has two benefits. As a direct benefit, more public goods make constituents better off and thus increase constituency support. As an indirect benefit, more \( y \) produces a healthier economy, thus more budget revenue, allowing the SNG to increase both \( r \) and \( y \). The larger is \( \alpha \), the greater the SNG’s provision of the public goods and the lower is its reliance on rents to maintain political support.

We illustrate this effect in figure 2.1 which shows how \( \tau(y) \) affects an SNG’s choice of \( r \) and \( y \). To make the case simple, we let the parameter \( a \), giving the cost of \( y \) relative to \( r \), equal one. When \( \alpha = 0 \), indicating that the SNG captures none of the increase in locally generated taxes, \( \tau(y) \), the SNG’s budget line is then given by the straight line in figure 2.1, \( r + y \leq T \). In this case, the SNG choose the combination \((r_o, y_o)\).

When the SNG captures a portion \( \alpha > 0 \) of \( \tau(y) \), the budget curve shifts outward in a non-linear fashion, as indicated on the figure. The shift makes the SNG’s budget non-linear because the budget increase, \( \alpha \tau(y) \), increases as the SNG chooses more \( y \). When \( y = 0 \), \( r = T \) and the budget shift is zero; when \( r = 0 \), \( y = T \) and the budget shift is largest.

This example shows how the effect of \( y \) on its budget induces the SNG to substitute \( r \) for \( y \). In the figure, \( r \) decreases somewhat from \( r_0 \) to \( r_1 \) while \( y \) increases from \( y_0 \) to \( y_1 \). Per our
comparative statics result, the effect of $\alpha \pi(y)$ on $y$ is larger than the effect on $r$. This reflects the fact that $y$ not only increases $S$ directly but shifts out the budget line.

Figure 2.1

![Diagram of budget lines and SNGs choice](image)

3. Applying the Model: The Economic and Political Effects of Revenue Sharing

Federal systems around the world employ a range of revenue sharing schemes. To investigate the incentive effects of revenue sharing, we compare two tax and revenue schemes. First, the
SNG raises all its own money, so that $T = T_0$ and $\alpha = 1$. In the second, the national government captures all locally generated revenue, possibly combining this with other revenue, and then divides the pool among all the SNGs. In the simplest scheme, the national government collects all the revenue from all SNGs and then divides this revenue among $n$ SNGs so that each receives $1/n$ of the total common revenue pool. Because the government takes all locally generated revenue from all SNGs and then returns $1/n$ of the total to each, $\alpha = 1/n$.

**The Fiscal Law of 1/n and FPWD**

We compare the effects of these two fiscal systems using equation (5),

$$\frac{U_r}{U_y} = \frac{1}{(\alpha \tau' - a)}.$$

The term in the (right hand side) denominator tells us, in comparison with the case where $y$ has no effect on the SNG’s revenue, how much the SNG’s choice of $y$ shifts the marginal rate of substitution at the optimum toward $y$ for a given $\alpha > 0$. When the SNG keeps all locally generated revenue, $\alpha = 1$, so the shift in the marginal rate of substitution is the full $\tau'$. Next we calculate the shift when the SNG keeps none of its locally generate revenue and receives all its revenue from the common pool, $P$, created by the revenue from all SNGs. In this case, the SNG’s budget is given by $B = T + 0 \cdot \tau(y)$, where $T = \left[ \frac{P - \tau(y)}{n} \right] + \frac{\tau(y)}{n}$. The last equation says that the total transfer, $T$, can be divided into two portions: first, the SNG’s share of the revenue raised in all other SNGs; and second, its share of the tax revenue raised in its own jurisdiction, $\tau(y)/n$. This implies that, when revenue from all SNGs goes into a common pool $P$, $\alpha = 1/n$. This yields the shift is in the marginal rate of substitution as $\tau'/n$.

From this analysis we derive the fiscal law of $1/n$: When the SNG raises all of its taxes, it chooses more $y$ because it captures all the subsequent increase in revenue due to $\tau'$; In contrast,
under revenue sharing, it captures only $\tau'/n$. In short, the relative effect of an increase in $y^*$ under complete revenue sharing scheme is $1/n$ the magnitude of the increase when the local governments captures all the locally generated revenue. Under revenue sharing scheme, the SNG must share nearly all the revenue increases (i.e., $(n-1)/n$ of the increase) with the other SNGs, while it retains only $1/n$ of the revenue increase. In contrast, when an SNG captures all its locally generated taxes, however, it keeps 100 percent of any increase in taxes from increasing $y$. For federal systems with many SNGs -- Mexico with 32 states, Russia with 89 regions, or the United States with 50 states -- the disincentive to invest in public goods can be large.

To illustrate the nature of the shift, we calculate an example. We let the relative cost parameter, $a = 1$, the number of SNGs be 32, and $\tau E(y, r, \tau) = y/4$. If there were no shift due to $\tau(y)$, i.e., if $\alpha = 0$, then the marginal rate of substitution between $r$ and $y$ at the optimum $(r^*, y^*)$ is given by $U_r/U_y = -1$. Under the fiscal arrangement where the SNG gets to keep all its revenue, $\alpha = 1$, the shift in the marginal rate of substitution is given by $\alpha\tau'$, which equals $1/4$ in this example. This implies that the SNG’s marginal rate of substitution at the optimum is:

$$\frac{U_r}{U_y} = \frac{1}{1-1/4} = \frac{4}{3}.$$  

In this case, the shift in the marginal rate of substitution produced by the effect of $y$ on local taxes accruing to the SNG is a full $1/3$.

Under the fiscal arrangement where the SNG keeps none of its revenue, but the federal government shares all collected SNG revenue equally among $n$ SNGs, $\alpha = 1/n$. Given $n = 32$, then the SNG’s marginal rate of substitution at the optimum is:

$$\frac{U_r}{U_y} = \frac{1}{(1-1/4)*(1/n)} = \frac{128}{127}.$$
In the common pool case, the shift toward $y$ induced by $\tau(y)$ is just $1/127$.

To summarize the effect in this example, consider the base case where $y$ has no effect on the budget. Then the shift marginal rate of substitution away from the base case when $\alpha = 1$ is a full $1/3$ and is more than 42 times the shift when $\alpha = 1/n = 1/32$.

Many parts of the world during the mid to late twentieth century exhibit a trend toward greater fiscal centralization. In Argentina and Mexico, for example, the national government made a political deal with its SNGs in which the SNGs gave up important aspect of their taxing authority in exchange for the national government providing greater revenue. National governments were able to offer this exchange in part because they gained monopoly authority over taxes. As Hayek (1939) and Tiebout (1956) noted long ago, competition among SNGs for tax base limits their ability to tax: too high a tax rate induces mobile factors to move to other jurisdictions. The national government faces no such constraint because it can impose the same tax laws across all SNG jurisdictions. Thus, when the SNGs give up their tax authority to the national government, the national government can set taxes at higher rates than allowed by SNGs facing competitive pressures.

We call this agreements *fiscal pacts with the devil* for two reasons. First, revenue sharing agreements typically require that SNGs give up their policy and fiscal autonomy. Second, these pacts induce the SNG to substitute non-productive transfers, such as corruption and rent seeking, for public goods. The tradeoff between $r$ and $y$ represents SNG’s tradeoff between corruption, rent-seeking and market intervention, on the one hand, and economically productive activities on the other. The simple model above shows that, holding constant for all other proclivities toward corruption and market intervention, the fiscal system affects an SNG’s incentives to foster markets. Put simply, the stronger an SNG’s fiscal incentives –as measured in terms of the
proportion of locally generated taxes it captures—the less corrupt and more pro-market oriented the government. All this generated simply by government officials pursuing their rational goal of political survival.

The model predicts that countries whose fiscal system primarily finances SNGs through revenue sharing should have higher rates of corruption than countries whose SNGs are primarily self-financing.

4. Applying the Model Part 2: The Effects of Political Competition on Good Governance

We now investigate how electoral competition systematically affects local leaders’ preferences. As noted, all SNGs need some level of political support in order to survive. Maintaining political support in localities where the government faces political competition requires greater attention to public goods provision than in areas where the government retains monopolistic control of elections. This is because an SNG that faces competition must appeal to the median voter, while a hegemonic SNG does not need to.

We model the difference between competitive and hegemonic SNGs as a shift in the representative voter’s utility function that they must satisfy. As shown in figure 4.1, the utility function for localities without competition, \( U(r,y;0) \), is systematically lower (prefer more \( r \), ceteris paribus) than the representative utility function for localities facing competition, \( U(r,y;1) \).

Along the flat budget line, \( \alpha = 0 \), the two types of leaders make different choices between \( r \) and \( y \), with the SNG facing greater competition choosing more \( y \) and less \( r \) than the leader who does not face competition.
To study how the fiscal incentives work differently in these two localities, we examine the shift in SNG choice when we increase $\alpha$ a fixed amount from $\alpha = 0$. Preferences of SNGs without competition are in the lower right. In this region, the fiscal leverage associated with an increase in $\alpha$ from $\alpha = 0$. In the figure, this SNG provides a tiny increase in resources devoted to corruption and a slightly larger amount to public goods.

In contrast, the preferences of leaders from a locality with a high degree of competition are in the upper left. In this region, a shift in $\alpha$ affords the SNG significant leverage, and it uses the increase in fiscal resources to provide approximately forty percent more public goods. There is also a small increase in corruption and rent seeking.

Figure 4.1
In sum, political competition makes SNG leaders more sensitive to constituent interests. The model predicts that political competition combines with the fiscal effect to give local leaders greater incentives to provide public goods.

5. Historical Background on Fiscal Federalism and Electoral Competitiveness in Mexico

We present here the general trends in twentieth century Mexico with respect to the fiscal federalism and electoral competitiveness.

A. Fiscal Federalism

Although the Mexican Constitution of 1917 established a decentralized fiscal system, revenue collection and expenditure became very centralized over the second half of the 20th century. We divide the evolution of the Mexican fiscal system into four periods. The first period covers the end of the Revolution to the late 1940s. States retained full fiscal authority, but the center was too weak to police the common market, and the system suffered from various common pool problems. The second period covers 1947 until end of the 1970s. The federal government slowly centralized fiscal power by coaxing all the states to enter a revenue sharing pact. The third period, covering 1980 to 1994, began with the establishment of a formula to allocate federal revenue among the states, all the states were in the FPWD and it was a period of great centralization. Finally, the fourth period covers from 1994 to the present. We discuss these periods in turn.
**Period 1: 1917-1947.** The victors of the Revolution (1910-1917) drafted a constitution with the aim of restoring political order and financial stability. The constitution granted exclusive taxing powers over strategic areas to the federal government and forbid the states from levying taxes that would obstruct the emergence of a national market. Yet the constitution failed to achieve these objectives. Well into the 1940s, the fiscal system remained chaotically decentralized as the Mexican federal system exhibited significant common pool problems. The states levied unconstitutional and overlapping taxes; they also erected internal trade barriers; and the federal government proved unable to police the constitution or the common market (Margain, 1971; Islas 1997, Diaz Cayeros 1999). To illustrate, in 1940 the three levels of government levied 80 separate taxes on industry and commerce and 32 on capital (*Presidencia de la Republica, 1997*). Exacerbating these problems, “corruption was rampant in every tax administration” (Ilas 1997). The result was too many taxes, protectionism that hindered interstate commerce, and corruption.\(^7\)

In the 1920s and 1930s leaders and interests in many states realized that there existed efficiency gains to improving cooperation among the states (Diaz Cayeros, 1999). However, consistent with the two dilemmas of federalism (de Figueiredo and Weingast 2000), the states failed to cooperate in the construction of a national market for two reasons. First, it was hard for states to trust one another because each had incentives to defect, and most states retained the necessary resources to re-start a war. This is evidenced by the smoldering civil war that persisted well into the 1930s. Second, it was hard for states to trust the federal government as a neutral enforcer of the national market (Diaz Cayeros, 1999).

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7 According to Diaz Cayeros (1999, 48), “The constitution prohibited taxes that would hinder interstate trade, but this was systematically violated. Local governments relied on immobile assets or on transactions that were easily measured. Producers had few exit options due to the state of physical infrastructure and the financial system. This state of anarchy hindered economic growth but politicians were unable to solve the collective dilemma.”
**Period 2: 1947-1970s.** Two contradictory forces were at work during the second period. First, in the initial phase of centralization, the federal government reduced the ability of the states to overgraze the commons. The political result was a federal system closer to market-preserving federalism (Montinola, Qian, and Weingast 1995, Weingast 1995). The economic result was greater economic efficiency, as witnessed by sustained growth commonly known as the “Mexican Miracle.”

However, by coaxing state after state to join the FPWD after 1947, the federal government progressively compromised the states’ ability to exercise independent policy and fiscal autonomy. By the end of the second period, fiscal pacts with the devil had significant political effects beyond their direct economic effects. By agreeing to these pacts, the states abdicated their right to tax several important areas of economic activity in exchange for revenue transfers and investment projects from the federal government. Also, the states would cease to collect unpopular local taxes.⁸ By centralizing tax collection and expenditure, the federal government increased its revenue and control over policymaking.

The federal government induced the states to join a FPWD through economic and political carrots and sticks. First, the federal government offered the carrots of additional revenue for states and exciting political careers to the state officials. Second, the federal government provided two sorts of sticks: first, it would collect federal taxes in the state used for the revenue sharing pool regardless of whether the state joined the pact; and second, the PRI’s system of rotation for political officials destroyed the ability of representatives to develop independent relationships with their constituents.

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⁸ According to Islas (1997), federal officers argue that states lack the political courage to raise their own taxes. “Appointments of tax collectors are often politically motivated and those selected are often not committed to the task or are strongly influenced by political pressures, such that relatives of the local authorities or powerful “caciques” do not pay their taxes at all” (Ilas, 1997)
In 1947 the federal government created a new, voluntary and contractual tax coordination system. States that joined would get more revenue in exchange for their authority to tax in the areas decreed exclusively federal. States that did not join could continue levying taxes in these areas, but they would continue to bear the cost of the federal taxes without receiving any revenue.

Between 1947 and 1952, eleven states joined this system: four under the control of the federal government: the Federal District and the territories of Quintana Roo and North Baja California and South Baja California; and seven voluntarily: Aguascalientes in 1949; Morelos, Queretaro and Tlaxcala in 1950; Michoacan and Sinaloa in 1951; and San Luis Potosi in 1952.

The next step in the fiscal centralization occurred in 1953 with the first Law of Fiscal Coordination (LFC). As with the previous agreement, the LFC was a contractual arrangement between two levels of government. The LFC’s intent was to coax the still reticent states to join the revenue sharing system. This law also declared the income tax exclusively federal; and the center committed to share a proportion of it with the states. This carrot was sufficiently attractive to induce seven more states to join: Colima, Yucatan, Hidalgo, Campeche, Tabasco, Puebla and Guerrero. Nonetheless, for the next two decades, fourteen states remained outside the system.

In 1972, the federal government increased the sales tax by one percent, sharing the increase with the states. The additional revenue induced even the most reticent states to comply with the voluntary tax coordination system (Presidencia de la Republica, 1997: 88).

The federal government completed its program of fiscal centralization in 1980, when it issued a new LFC. In exchange for greater centralization of tax authority, states received increased and supposedly less arbitrary transfers that would be regulated by a formula. Prior to

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9 The new law also introduced two big changes in the revenue sharing system. First, it created the value-added tax (impuesto al valor agregado, IVA), replacing a vast number of municipal and state taxes on production and services.
1980 the central government shared with the states a portion of two specific taxes (the sales tax, and income tax); since then it has shared a proportion of a larger set of taxes. The 1980 law also markedly increased the proportion of revenue that the central government transferred to the states.

**Period 3: 1980-1994.** The third period of Mexican federalism starts with the 1980 reforms. This new system completed the centralization of tax authority and established a formula to provide transparency to the assignation of the Transfers fund. Stability was not established, however, as the central government altered the formula frequently: in 1981, 1983, 1984, 1988 and 1990.10

**Period 4. 1994-Present.** Since 1994, population and revenue raised in a state are accorded equal weight (45.17% each) in the distribution of funds. We analyze this formula in section 6. Moreover, the fiscal constraints on the national government have allowed some freedom to emerge for lower governments, particularly municipalities.

**B. Electoral competition**

Between its formation and the late 1980s, the PRI controlled nearly all elected and appointed offices at all levels of government. This began to change after the fraud ridden and highly contested presidential elections of 1988.11 In 1988, opposition parties governed only 39 of the 2,419 municipalities, (1.6% of the population); by May 1999, these parties governed 583 municipalities (46% of the population). In 1988 all 32 states had a PRI governor; by May 1999

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10 We analyze two of these formulas in section 6; Appendix 1 summarizes the various changes in the formula.
11 The following data comes from Lujambio 2000.
10 states (32% of the population) had opposition governors, including the Federal District.

Similarly, in 1988 the PRI had the necessary supra-majorities to legislate in all matters in all the nation’s legislative assemblies; by May of 1999, the PRI had this level of control in only two of the 34 assemblies. The opposition’s success deepened in the 2000 presidential elections where for the first time a party other than the PRI won the presidency.

These changes were brought about by different political and economic developments: the fiscal changes discussed above in combination with the international debt crisis and the fall in oil prices in the early 1980s, the breakdown of the elite coalition in the PRI and a split of the party in 1986, several electoral reforms of which the last (1996) was approved by all the parties represented in congress. This is not the place to analyze the sources of these changes, but for the purposes of this paper, after 1988 electoral competition had become a reality in many municipalities and states.

6. Empirical Evidence about Mexico’s Fiscal Pacts with the Devil

In this section, we provide five pieces of evidence from Mexico to support the predictions of our model: we account for why different states joined the FPWD at different times; we provide evidence about changes in the spending and taxing behavior of states after entering the FPWD; we calculate $\alpha$ from the different revenue sharing formulas used after 1980; we provide evidence of the changes in good governance with the emergence of political competition; and we support our hypothesis of the changes in the rate of growth as $\alpha$ changed.
A. Explaining which States Delayed Joining the FPWD

Given that all Mexican states faced the same carrots and sticks for joining the FPWD, what explains the differential willingness to enter these agreements? Fourteen states, the Federal District and two territories (these latter three governed directly by the federal government) joined in the late 1940s and early 50s. In contrast, fourteen states waited over two decades to join, in 1972. Our theory predicts that the more market-oriented states are likely to be the last to join. The reason is that, ceteris paribus, the marginal effect of public goods on local tax revenues differs across states.

To test our hypothesis, we investigate the relationship between when states joined the FPWD and various economic indicators. The analysis reveals that, per our predictions, the richer and more market oriented states on average joined later. For example, the average per capita state income of states joining in the 1940s and 50s was approximately 5,600 pesos in 1970; whereas for the states that joined in 1972, it was approximately 16,000 pesos, roughly three times higher. Similarly, states that joined later had far more exports. At present, we only have export figures for 1998, so this figure is only indicative. States that joined the FPWD early averaged exports of $1.2 billion in 1998, whereas those joining late averaged exports of $4.4 billion, a factor of roughly 3.7 times larger.

To obtain more systematic evidence, we used logit analysis. To create the dependent variable, we divided states into those who joined early and late. We used two independent variables, state GDP per capita in 1970 and state exports in 1998.

The results are reported in Table 6.1. They show that GDP per capita is a statistically significant determinant of the decision to join early. In contrast, the variable, exports in 1998, is not statistically significant (perhaps because our data for this variable is for a date so much later
than when these states made their decisions to join). The overall performance of the logit is also good. For example, it correctly predicts 74.2 percent of the cases, which out performs the null model’s correctly predicting 54.8 percent of the cases.

The evidence supports our theory. On average, states with higher per capita income joined later.

**B. The Impact of the FPWD on Governance**

We have argued that, by breaking the relationship between the provision of local public goods (more broadly, good government) and state revenue, FPWD diminished state officials’ incentives to foster a prosperous economy. After joining the FPWD, states should thus substitute away from public goods to non-productive expenditures, such as corruption.

**Table 6.1: Logit Analysis of When States Joined the FPWD**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Estimated Coefficient (t statistic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-2.36* (2.47)</td>
</tr>
<tr>
<td>GDP/capita</td>
<td>0.25* (2.02)</td>
</tr>
<tr>
<td>Exports</td>
<td>-0.075 (.44)</td>
</tr>
<tr>
<td>No. observations</td>
<td>31</td>
</tr>
<tr>
<td>Percent Correctly Predicted</td>
<td>74.2</td>
</tr>
<tr>
<td>Log Likelihood</td>
<td></td>
</tr>
<tr>
<td>Initial</td>
<td>-21.5</td>
</tr>
<tr>
<td>Convergence</td>
<td>-15.2</td>
</tr>
</tbody>
</table>

* Statistically significant at the .05 level.
Table 6.2 provides some modest evidence of an increase in rents over public goods after the states all joined the FPWD. The table shows the percentage growth of employment in the government and in the economy. In the period 1910-1970, public sector employment was 1.2 percent of total employment; by 1970-1983 it had become 20 percent. Consistent with our theory about subnational governments under the FPWD, public employment in municipalities and states grew even faster than federal employment, and at a time when policy responsibly shifted to the federal government. Although some of the public sector growth represents an increase in public services, some of it reflects politicians offering jobs to supporters as part of the PRI’s extensive patronage system. Indeed, *aviadores* are common throughout the public sector in Mexico: people on the payroll who never show up to work but receive their checks.

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<tr>
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</thead>
<tbody>
<tr>
<td>% Growth of govt. employment</td>
<td>243</td>
<td>118</td>
<td>127</td>
<td>151</td>
</tr>
<tr>
<td>% Growth of Federal govt. Employment</td>
<td>958</td>
<td>348</td>
<td>185</td>
<td>647</td>
</tr>
<tr>
<td>% Growth of Municipal and State govt. employment</td>
<td>1142</td>
<td>350</td>
<td>182</td>
<td>639</td>
</tr>
<tr>
<td>% Growth of Municipal and State govt. employment</td>
<td>505</td>
<td>339</td>
<td>203</td>
<td>690</td>
</tr>
<tr>
<td>Ratio of Public sector /total employment</td>
<td>1.2</td>
<td>4.8</td>
<td>14</td>
<td>20.4</td>
</tr>
</tbody>
</table>

Source: the authors with data from Zaid 2000
Our theory also makes several predictions about tax collection following the FPWD. First, it predicts that state taxes should go down after accepting a FPWD. As $\alpha$ decreases, states have incentives to substitute towards non-productive expenditures; as shown in the section 3.B, tax collection effort should also fall, so locally raised revenue should fall. Second, we argue that the federal government created the system in part to capture a central monopoly on taxes, allowing it to extract greater resources from the economy. In other words, our theory predicts that total federal taxes should rise following the FPWD. We discuss these predictions in turn.

Ideally, we could use time series data on state taxes to investigate how taxes fared before and after each state joined the FPWD. Such data is difficult to obtain. Instead, we look at the behavior of all states following the 1980 changes. As suggested above, this date represents a watershed year in the fiscal system, as state dependence for revenue on the federal government increased dramatically.

The effect of the 1980 changes on state taxes is easily seen in figure 6.1. In the decade prior to 1980, state taxes averaged a little above one percent of GDP. Over the next decade, state taxes fell continuously so that, by the end of the decade, they were below one-half a percent of GDP. The figure also shows the incentive of “bribe” aspect of the revenue system: the fall in locally generated taxes is more than compensated by the rise in revenue sharing.

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12 A recent econometric study, for example, claims that after 1980, for every peso given through transfers, state treasuries reduced their own tax revenue by 17 cents, (Gutierrez and Islas, 1995; 139).
Another way to measure the fiscal impact is to assess the proportion of revenue raised by a state from its own taxes. The ideal data set would cover the entire period, so we could see the differential impact of the early FPWD on both types of states (early and late joiners). Unfortunately, we have data only from 1970 onwards.

The data reveal significant changes following both the 1972 and 1980 centralizations. Per our theory’s predictions, state taxes as a proportion of total state revenue fell dramatically after 1972: from 45 percent prior to the 1972 to 29 percent for the rest of decade (table 6.3). This proportion fell again dramatically after 1980, to 3 percent, remaining slightly lower in the late 1990s.
Table 6.3: State Taxes as a Proportion Of Total Revenue (percent)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-72</td>
<td>45</td>
</tr>
<tr>
<td>1973-80</td>
<td>29</td>
</tr>
<tr>
<td>1981-94</td>
<td>3</td>
</tr>
<tr>
<td>1994-99</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: INEGI

We now turn to our second prediction – that federal taxes exhibit a greater rise than the decrease in state taxes. Systematic data for all the different federal taxes is hard to obtain. Nonetheless several indicators are consistent with our theory. First, consider the change in the federal taxes after the fiscal changes in 1980 (see figure 6.1). Federal taxes in 1980 were approximately 15-16 percent of GDP, with oil revenue representing approximately half of the total. The 1980 law imposed a new value added tax, generating new revenues of between two and three percent of GNP. This represents an increase in non-oil revenue on the order of one quarter to one third. Similarly, collection of the income tax (created in 1972, the year of the final FPWD) increased 22 percent every year since its creation.

A final illustration concerns the federal sales tax. When states joined the FPWD in 1972, the sales tax became exclusively federal, and the states outside this agreement stopped collecting this tax. At this time, the federal government also increased the rate of the federal sales tax to four percent. Even so, collection of the sales tax increased far more than was projected based on the conditions of the previous presidential administration (see table 6.4). Four years later, in 1976, actual receipts were over two and one half times anticipated receipts.
Table 6.4 Effects of FPWD on the Collection of the Federal Sales Tax (million pesos)

<table>
<thead>
<tr>
<th>Year</th>
<th>Projected collection*</th>
<th>Total collection</th>
<th>Unanticipated increase (%)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>6.0</td>
<td>7.6</td>
<td>26</td>
</tr>
<tr>
<td>1974</td>
<td>6.8</td>
<td>10.6</td>
<td>55</td>
</tr>
<tr>
<td>1975</td>
<td>10.2</td>
<td>17.4</td>
<td>95</td>
</tr>
<tr>
<td>1976</td>
<td>11.7</td>
<td>28.7</td>
<td>170</td>
</tr>
</tbody>
</table>

Source Escamilla de León (1999)
* projection based on the prevailing tendency in the previous presidential term
** between projected and actual

In short, the evidence supports both of our theory’s predictions about the changes in tax revenue.

C. Calculating “α” and the Incentive Effects in Mexico’s Revenue Sharing Formula

We now investigate incentive effects of the various formula employed in Mexico’s revenue sharing system after 1980. In particular, we calculate the marginal retention rate, α, for three of the formula employed over the period.

(1) Analysis of the 1980 formula. We begin with the formula used in 1980,

$$ R_i = \frac{A_i}{\sum_j A_j} $$

where $R_i$ is the revenue share allocated by the formula to state $I$ from the common pool, $P$, where $P = \sum_j A_j$, and $A_j$ is the amount of revenue raised in state $j$. The formula says that a state’s revenue share, $R_i$, is the fraction of the total revenue pool represented by the share of taxes raised in its state.

Our theory yields several implications about this revenue sharing formula. First, the formula provides good incentives on the portion of revenue allocated by formula: a state captures 100 percent of any increase in local revenue flowing into the pool. Second, because only a small portion
of funds spent in localities is allocated by this formula, the incentive effects of the centralized fiscal system are actually much worse. In 1980, the amount of funds spent by the federal government in the states on local projects was approximately four times that allocated by the revenue pool. Thus, although the funds allocated by formula are on the order of only one fifth of those spent locally, implying that \( \alpha \) is on the order of .2. Third, the negative effect on locally generated taxes is likely to be larger in the more market oriented states. The reason is that in these states the effect of public goods on locally generated revenue is likely to be larger in these states.

The 1980 formula involves no redistribution to poorer states. Remarkably, each state puts in \( A_i \) and receives back \( A_i \). To see this, notice that state i’s share of the total pool, \( P \), is \( RiP = \left( \frac{A_i}{\sum_j A_j} \right)P \). Substituting for \( P \), yields that each state gets back \( A_i \).

These results for the revenue sharing formula in used in 1980 demonstrate that the purpose of this FPWD and under this revenue scheme cannot be redistribution. Because each state gets back the same amount that it puts in, the purpose of revenue sharing must be political and not redistributive.

(2) Analysis of current formula (1995-present). Mexico’s current formula for distributing revenue dates from 1995 and has three components. The formula allocates 45.17% of the revenue pool on the basis of population; 45.17% by a formula, analyzed below; and 9.66% in inverse proportion to the other two criteria.

The component based on population is simple to analyze. A state with a proportion, \( q_i \), of the population receives \( .4517q_i \) of the total pool. The formula entitles a state of average population (3.125% of the total) to receive \( .4517*.03125P = .014P \). This also implies that, if a state changes its
policies so that it increases its revenue by x\%, this component entitles the average state to .014x, or about 1.4\% of the increase.

We analyze the 45.17\% of total revenue allocated under by formula. It implies several different effects. After 1980 the federal government attempted to give states an incentive to improve their collection of tax revenue. The 1995 formula does this in a clever if complicated way.

Since 1995, Mexico has used the following formula (F1) for distributing 45.17\% of the pool based on revenue collection:

\[
R_{i,t+1} = \frac{R_{i,t}(A_{i,t} / A_{i,t-1})}{\sum_j R_{j,t}(A_{j,t} / A_{j,t-1})}
\]

where \(R_{i,t}\) is state i’s share of the total revenue in time t; \(A_{i,t}\) is the proportion of revenue pool, P, raised in state i in time t; and the total revenue pool, P, is given by \(P = \sum_j A_{j,t}\).

The incentive effects of this portion of the formula are good: the formula returns any increase in tax revenue contributed to the common pool. Mathematically, this is easily shown since \(\frac{\partial R_{i,t}}{\partial A_{i,t}} = 1\). Intuitively, this can be seen by considering what happens when one state raises its tax collections by x\%, assuming that the revenue from all other states remains constant. The numerator of the formula becomes \((1 + x) R_{i,t}\), and the denominator becomes \(\sum_j R_{j,t} + x R_{i,t}\). Suppose that state i produces 5\% of total revenue and that it increases collections by 10\% (i.e., \(x = .1\)). Then the numerator becomes 1.1*.05 = .055; and the denominator becomes .95 + .1*.05 = 1. So a ten percent increase in locally generated revenue leads to a ten percent increase allocated by the formula. To summarize, the formula says that, holding constant for the behavior of other states, if state i increases its revenue, this year over last year, then next year it will receive nearly the full increase. Of course, this formula applies only to 45.17\% of the total pool.
We now investigate the impact of the formula as a whole on a state’s marginal incentives. Thus, if state i increases its collections by x%, the overall formula has three independent components that affect state i’s portion of the increase. First, by the population component, state i with population proportion \(q_i\) receives back a portion of their gain from the common revenue pool of \(0.4517q_i\)\(\cdot x\). For a state with the average population of 0.03125, this implies that state i receives back 1.4% of the gain. The second component is by the complex formula, F1, which grants state i 45.17% of the gain. The third component, based on inverse of population, grants a state with the average population an additional 0.3% \(x\).

Thus, for a state with the average population, an increase of x% of revenue translates into three components of gain are: \(0.4517x\), \(0.014x\), and \(0.003x\), for a total increase of \(0.466x\). Of course, the overall formula represents only half of all federal revenue spent in the states. This implies that, at the margin, each state keeps a little less than one quarter \((0.233)\) of any increase in locally generated revenue.

(3) Analysis of the 1991 formula. As indicated in the Appendix, the revenue sharing formula evolved in the early 1990s. The difference between these formulas and that initiated in 1994 is solely the weights accorded the three portions allocating funds based on population, revenue collection, and the inverse of the first two. As shown in table A.1, the weights changed in each year from 1991-94.

The analysis of the 1994 formula can readily be applied to these earlier formulas. The 1991 formula is perhaps the most interesting of the group. This formula allowed states to capture 72.29 percent of their revenue collection. Recalling that the revenue allocated by formula is about half that spent by the federal government in the states at this time, the 1991 formula implied a higher \(\alpha\) than the 1994 formula, on the order of 0.37. As table A.1 reveals, the
proportion allocated by on revenue collection systematically decreased from 1991 to the present formula analyzed above so that \( \alpha \) decreased from approximated \(.37\) in 1991 to \(.23\) in 1994.

**Implications of the revenue sharing formula.** Over the 1980s and early 1990s, Mexico changed its formula for distributing revenue from the common pool. Throughout this period, the system provided poor incentives for improving tax collection and promoting local growth.

Unfortunately (from the incentive point of view), the revenue going into the pool and thus covered by the three-part formula just analyzed is only a portion of total funds spent by the central government in the states and localities. The amount of discretionary money given states under other categories — earmarked funds referred to as federal investment -- far exceeds that given in this category. In 1982, federal investment in the states on average exceeded transfers by a ratio of four to one. In the late 1990s, Federal investment approximately equaled transfers. Further, due to Mexico’s centralization, including the FPWD, states have many fewer policy options.

In terms of the theory in section 2, a marginal factor of 100 percent on approximately 20 percent of all revenue raised spent in the states (in 1982) yields an \( \alpha \) of just \(.2\). Given the comparative statics in section 2, this implies that Mexican states in the early 1980s faced very low fiscal incentives to produce market fostering public goods. In recent years, the formula has changed, but the situation has not improved markedly. We calculated that the proportion of revenue returned to each state by the formula was \(.466\). The revenue transferred to the states allocated by the formula is now about one-half of all revenue transferred to the states. Taken together, these two observations imply that, in present day Mexico, \( \alpha \), the marginal revenue return from expenditures fostering local economic prosperity, is \(.466* .5 = .233\).

We do not have the figures on total federal spending in the states prior to 1980, hence the implied \( \alpha \) is hard to assess for the earlier period. Yet the data in figure 6.2 and table 6.3 bear on this
issue. Federal taxes and spending in the states increased after 1980. With respect to state taxes: prior to the final FPWD in 1972, states raised 45 percent of their own revenue; this proportion fell to 29 percent for the period 1973-80, and then dramatically fell again, to 3 percent for the period after the 1980 fiscal changes. These figures are average revenue raised, while $\alpha$ is the marginal revenue collection. Nonetheless, the systematic changes in 1972 and in 1980, dramatically increasing federal taxes and lowering state taxes, suggest that $\alpha$ fell significantly.

D. The Effects of Political Competition in Municipal Government

Our theory predicts that SNGs, which face electoral competition, have a stronger preference for providing public goods over rents. In order to isolate the effects of political competition from those of changes in $\alpha$, we investigate the changes in municipalities after 1988, when electoral competition became a reality but $\alpha$ remained constant. The findings accord with our theory.

A voluminous case study literature has emerged in the last few years that studies the changes in government operation in municipalities in Mexico.13 Many analysts say that these changes amount to a “new municipal governance.” Ward (1998) summarizes the general trends of change in municipal governance observed in these case studies. First, recruitment patterns for both nominations to elected office and appointments have moved from a clientelistic system to one based on the skills, experience, and local popularity of the prospective officers. Second, municipalities have increased their tax collection efforts and have greatly diminished the dependence on federal and state transferences, and to finance a high portion of their expenses with municipal taxes. Third, the political agenda of municipalities has moved from being

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concerned only about the provision of basic services, to focusing on promoting rule of law and markets, including: modernizing the police, promoting cleaner markets and slaughterhouses, building highways, paving streets, and engaging in urban planning. Fourth, because political competition implies that their political careers depend more on the popular perception of their job than on the leadership of their parties, municipal presidents have become more autonomous from their parties and from the corporatist organizations to which traditional PRI administrations had very strong bonds.

These changes are more pronounced in the richer and more urbanized municipalities that have more administrative capacity and possibilities to generate their own income. The changes are stronger in Panista cities in the North and the rich Bajío region. The export-orientation of many of these areas also increases the demand for the good governance necessary to promote growing markets.

The fiscal experience of the municipalities electing the opposition PAN in the 1980s and 1990s accords with our theory. Diaz-Cayeros, Magaloni, and Weingast (2000) show that municipalities that defect from the PRI by electing the opposition pay a substantial fiscal penalty in terms of lower revenue transfers from the PRI controlled state and federal governments.

Our theory helps explain how the PAN survived despite the PRI’s fiscal punishment. As a market-oriented municipality opted out of the PRI-fiscal system to take control of local public goods provision, its revenue increased along with the local economy. In combination with lowering levels of corruption, enhanced delivery of public goods and services greatly increased local citizens’ willingness to pay taxes and new user fees. For localities that elected PAN governments, local tax revenue grew quickly to replaces losses from the state and federal governments. Rodriguez (1995,166) reports of Ciudad Juarez, for example, that AOver the
course of only a few years [after electing the PAN], the ratio of state to local revenues… changed from around 70 percent state funding to over 70 percent local funding (ingresos propios). In particular, during the first year of the panista government, 1984, local revenue increased 300 percent.

Moreover, per our theory, the changes in behavior of municipal governments are not just associated with the new opposition governments. These changes can also be seen where the PRI municipal governments that face political competition. As with the opposition governments, PRI governments facing competition are forced to improve services and the fiscal system.

E. The Effects of Revenue Sharing on Economic Growth

We argue that revenue sharing pacts motivate local politicians to reduce efficiency and increase corruption, and therefore dampen economic growth. Mexico’s FPWD seems best interpreted as helping the center create political power and rents rather than enhancing efficiency. Our theory has several predictions about the impacts of changes in \( \alpha \) over growth in Mexico. In the first period (1917-1940) common pool problems slowed down growth. In the Second Period (1947-1980) the ability of the center to police the common market brought about major efficiency improvements. However, by coaxing states to join the FPWD, the center also compromised growth in those states. Growth was dampened in the third period (1980-1994). Since 1994, increases in both competition and in \( \alpha \) have boosted growth. The figures discussed in the introduction bear out this pattern: growth averaged 2.3 percent from 1980-93 per year, increasing to 5.1 percent from 1996-99.

To study the effects of the fiscal changes on economic growth, we created a sample of five states that joined the FPWD early and five that joined late. The fiscal system treated these
states differently, with significant effects on growth. The sample included: early joiners: Aguas Calientes, Campeche, Guerrero, Michoacan, and Puebla; and late joiners: Chihuahua, Durango, Mexico, Nuevo Leon, and Zacateca.

As noted above, late joining states were richer. For expenditures, expenditures in late joining states averaged 647 million pesos per year (1970-72), while those joining early averaged 178 million, a ratio of about 3.6 (late to early). Similarly late joiners had larger state GDPs. For the year 1970, early joiners average 7.5 billion pesos GDP while late joiners the figure is 18.1 billion pesos, about 2.4 times larger.

As we have already noted, two major events occurred in the early 1980s that affected these patterns: the change in the fiscal system, resulting in greater centralization; and the exogenous economic shocks caused the international debt crisis and by collapsing oil prices. Given the data we have, we cannot separate the effects of these two changes.

The first major change is the relative growth of state expenditures among the early joiners. We have calculated the ratio of state expenditures (late to early joiners) for the two periods, 1970-80; and 1980-94. This calculation is reproduced in table 6.5.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Ratio (late to early)</td>
<td>4.17</td>
<td>2.16</td>
</tr>
</tbody>
</table>

The data reveal a dramatic change in expenditures: the ratio of expenditures (late to early joiners) falls by nearly a factor of one-half after 1980. Because nearly all state expenditures after 1980
were financed through the federal revenue sharing system, the new tax system clearly gave disproportionately more revenue to the early joiners.

We next turn to the state GDP growth rates. By separating the states into the two sets of early and late joiners, we are able to assess the differential impact of the two changes (changes in the fiscal system; and exogenous economic shocks) across the two sets.

The data show that real state GDP growth rates for the late joiners is somewhat larger than the early joiners in the early period, 7.5 percent versus 6.6 percent per year respectively (table 6.4).

| Table 6.4: Average Real State GDP Growth Rate, By Group and Period (percent per year) |
|-----------------------------------|-----------|-----------|
|                                   | 1970-80   | 1980-93   |
| Early Joiners                     | 6.6       | 3.0       |
| Late Joiners                      | 7.5       | 1.7       |

The data also show that the growth rates of both groups fall dramatically after 1980, as is well-known. The fall, however, is much larger for the late joiners: average GDP growth per year is 3.0 percent for the early joiners while only 1.7 percent for the late joiners.

The change in growth rates is consistent with the FPWD hypothesis: growth rates should fall more in states joining later. Moreover, the smaller fall for the early joiners is consistent with the evidence from the data on expenditures (and hence redistribution). Because the early joiners get proportionately more transfers under the revenue sharing scheme, they are likely to growth at a greater rate (assuming that some of the revenue is spent on public goods!). Of course, there are many alternative hypotheses about why state GDP growth rates should fall. Perhaps the debt
crisis and the oil shock hit the richer states harder. Nonetheless, the fact that growth rates for the late joiners fall more than for the early joiners is consistent with our hypothesis.

7. Conclusions

In this paper, we examine how political institutions affect good governance. Our context is fiscal federalism. We show that different forms of decentralization have markedly different effects on governance, as indicated by the incentives of SNGs to foster local economic prosperity.

The theory examines how SNGs make tradeoffs between providing public goods that foster markets and non-productive expenditures, such as rent-seeking, transfers to interest groups, and corruption. The analysis shows that revenue sharing greatly reduces a state’s incentive to produce public goods. When an SNG raises the lion’s share of its revenue, it has the possibility of recouping the costs of providing market-fostering public goods through the increased revenue generated. When an SNG derives most of their funds from a revenue sharing system, increases in revenue from providing public goods go into the common pool, shared among all states. Because an SNG bears all the costs of providing public goods but receives only a portion of the return, it will provide a much lower level of public goods.

In comparison with engaging in corruption or rent seeking, providing public goods generates two sources of value for an SNG. Because citizens value public goods, these goods
generate direct utility for citizens. Public goods have an indirect value as well: providing public goods generates more tax revenue, thus relaxing the SNG’s budget constraint.

The model yields a comparative statics result. The greater the proportion of locally generated revenue captured by the SNG, the more the SNG substitutes public goods provision for corruption. We showed that a major consequence of this result is the fiscal law of $1/n$: the indirect effect of fostering greater SNG choice of public goods in a complete revenue sharing system is $1/n$ that of a fiscal system in which SNGs capture all locally generated revenue. The reason is that in revenue sharing systems that allocate revenue independent of contributions, nearly all the increased revenue from providing additional public goods goes into the common pool, implying that the SNG receives only on the order of $1/n$ of the increase. Revenue sharing systems therefore greatly diminish an SNG’s incentive to provide market fostering public goods; they also increase corruption and rent-seeking.

Consistent with this result is the following pattern among federal systems. During the United States’s rise from a small economy on the periphery of the developed world in the late eighteenth century to become the richest nation by early twentieth century, states depended almost exclusively on their own sources of revenue. So too do provinces in modern China (see Jin, Qian, and Weingast 2001, although this has changed somewhat in the late 1990s). Iaryczower, Saiegh, and Tommasi (2000) suggest that this characteristic also held in Argentina during its high growth phase in the latter part of the nineteenth century and early twentieth centuries. In contrast, this condition fails for modern Argentina, India, Mexico, and Russia.

We applied our framework to Mexico, whose federal system has gone through four phases since the Revolution in the early 20th century, each with different implications for efficiency and growth. In the first federal phase, the absence of central control fostered common
pool problems as states over-grazed the commons. Too weak a center allowed competitive
taxation of businesses, state corruption, and internal trade barriers, resulting in significant
efficiency losses. In the second phase, beginning in 1940, the federal government rationalized
taxation, removed burdensome taxes, established the common market, and generally policed
common pool problems. States maintained several independent sources of revenue. High growth
ensued for the next thirty years, resulting in a period known as the AMexican Miracle.”

In the third phase of Mexican federalism (after 1980), the central government worked in
tandem with the ruling political party, the PRI, to centralize power, authority, and finances.
Gradually, the central government coaxed the states into giving up their policy and taxation
authority in exchange for revenue and attractive career alternatives for politicians. Growth stalled
substantially during the third phase.¹⁴ The theory implies that Mexico’s present revenue sharing
scheme is characterized by the fiscal law of 1/n.

Our analysis of the various revenue sharing formulas employed by the central
government bear out the theory. The initial formula returned almost exactly the same revenue to
the states as they put in. The purpose of this formula could not be either of the principal
normative rationales for revenue sharing -- redistribution or insurance against shocks -- there was
none. All the formula employed by the central government since 1980 exhibit aspects of the
fiscal law of 1/n.

This paper also analyzed the central government’s method of coaxing the states to join
the fiscal pact with the devil. These pacts forced states to toe the national party line, greatly
reducing their ability to pursue policies independent of the center. The central government
accomplished this by a series of carrots and sticks. On the cost side, the federal government

¹⁴ Of course, this third phase of Mexican federalism also coincided with the onset of the international debt crisis,
which had deep effects on Mexico.
collected its tax revenue in each state regardless of whether they joined the revenue collection system. On the benefit side, states obtained greater revenue if they joined the federal system. The center’s incentives implied that retaining policy freedom forced states to have higher taxes and lower revenue.

In closing, we speculate on a larger question. Our emphasis on the costs of revenue sharing forces us to ask why the Mexican government created this system. The answer, we argue, is that Mexico’s dominant ruling party, the PRI, created this system to help preserve its power. First, the revenue sharing system afforded the PRI, via its control of the federal government, a near monopoly on taxes. This allowed them to extract greater total revenue from the economy than could the states acting independently. Second, the PRI used this revenue to solidify constituent support. Nearly all empirical investigations of Mexico’s expenditure programs show that they are used to help the PRI win elections rather than to address the policies to which they are nominally associated (see Diaz-Cayeros 1997, Diaz-Cayeros, Magaloni, and Weingast 2000; Magaloni 2000; Mortgenstern 19**; and Weldon and Molinar 1994). Third, the system helps the PRI keep its officials in line with the party. By reducing the policy and fiscal authority of states, the PRI made it difficult for SNG officials to simultaneously defect from the system and create an independent source of political power. Finally, following Diaz-Cayeros, Magaloni, and Weingast (2000) and Fiorina and Noll (1978), we argue that this system provides citizens with the incentive to accept it. The reason is that, acting alone, citizens in a given locality cannot affect the system and yet face direct punishment. Yet electing the opposition means that the center punishes them, as the PRI withholds fiscal resources.

The “tragic logic” of modern Mexican political economy is that the PRI’s system at once accomplished two goals: It skimmed a large portion of social resources used to ensure its own
survival; and it provided citizens with the incentive to go along (Diaz-Cayeros, Magaloni, and Weingast 2000).

The model has implications beyond the study of Mexico. Our approach shows that good governance requires the appropriately designed political institutions. For government officials to implement policies that increase social surplus, they must have incentives to pursue these policies instead of transferring resources to private groups or engaging in corruption (see also Persson and Tabellini 2000, among others). We showed how fiscal institutions affect how political officials make the tradeoff between the provision of public goods and corruption. Greater fiscal reliance of SNGs on their own resources induces them to provide more public goods and less corruption. The model shows that the degree of corruption and inefficiency is in part endogenous to the fiscal system.

When central government policies are a major impediment to economic growth, the appropriately structured decentralization can enhance government performance. First, as is well known, appropriately structured decentralization creates competition among jurisdiction, forcing them to attend to the inefficiencies, rent seeking and corruption associated with their policymaking. Second, it diminishes the Aone-size fits all” problem observed by Hayek (1939). Third, as we have shown in this paper, fiscal decentralization also provides SNGs with the incentive to foster local economic prosperity.

In this work, we join a growing group of scholars who emphasize that good governance is a function of political institutions. Our exploration of the effects of the fiscal system on SNG decision-making demonstrates how fiscal institutions affect their decisions to foster markets or engage in corruption. Put simply, greater revenue self-reliance allows SNGs the ability to capture
greater revenue from enhancing markets and thus biases their choices in favor of market fostering public goods over corruption.

The following text box summarizes various changes since 1980 in the criteria utilized by the Mexican federal government to share revenue with the states.

- In 1980 the Transfers fund was allocated among the states solely on the basis of the proportion of federal taxes raised in each state.

- In 1981, each state received the same nominal amount as in the previous year, and the increase in the Transfers fund (i.e. Transfers fund 1981- Transfers fund 1980) was distributed among the states taking into account the collection effort of each in the current year.

- In 1983 the formula again assigned each state the same nominal amount as the previous year, plus a proportion of the increase in the Transfers fund taking into account their collection efforts of the year with respect to the past two years.

- In 1984, the central government attempted to stimulate the collection of the Value Added Tax (IVA). Since the reform of 1980, states were responsible for collecting the IVA and for sending a portion to the federation. In this year, the formula allowed each state to keep 30% of the IVA it collected, plus an amount similar to that received by each the year before, modified a bit by general collection effort of the past year.

- In 1990 the federation took IVA collection away from the states and made transfers based on three criteria: population, tax collection effort, a small part inversely related to population. During the next four years, the federal government tinkered with the relative weight of the three criteria. Table 4.2 shows the percentage of the Transfers fund that was distributed by the three assignations criteria in the years 1991 to 1994.

- Since 1994, 45.17% of the Transfers fund has been distributed according to state population; 9.66% in inverse per capita relation; and 45.17% according to a formula that awards the states the same nominal amount as the previous year, plus a proportion of the increase in the Transfers fund taking into account their collection efforts of the year with respect to the past two years.
Since 1991, the revenue-sharing formula has been the same, consisting of three components: population, revenue raised in the state, and a category representing the inverse of the other two. However, the weights of the categories changed. The following table shows the weights accorded to the categories since 1991.

<table>
<thead>
<tr>
<th>Year</th>
<th>% distributed by population</th>
<th>% distributed by formula based on revenue collection</th>
<th>% distributed in inverse to the other two criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>18.05</td>
<td>72.29</td>
<td>9.66</td>
</tr>
<tr>
<td>1992</td>
<td>27.10</td>
<td>63.24</td>
<td>9.66</td>
</tr>
<tr>
<td>1993</td>
<td>36.15</td>
<td>54.19</td>
<td>9.66</td>
</tr>
<tr>
<td>1994-present</td>
<td>45.17</td>
<td>45.17</td>
<td>9.66</td>
</tr>
</tbody>
</table>

Source: *Presidencia de la Republica*
References


*Presidencia de la Republica* 1998.


