A perspective of net tax collection and federalized public spending in Mexico

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Abstract

In the year 2015, tax revenues accounted for 86.9% of the federal taxable income. That is, almost 87 cents of each peso of the resources that subnational governments can participate come from federal taxes. In the present work an analysis of the behavior of both net tax collection and federal subnational expenditure in Mexico for the period 2009-2015 is carried out. A data panel with information on the net fiscal revenues that the federal government collected in the 32 Mexican federal entities as well as the federalized expenditure exercised in those territories. The multiple regression technique is used considering fixed effects in the cross sections to estimate the elasticity or sensitivity of federalized spending in relation to the main sources of net fiscal revenues of the federal government. The results allow to verify that the coefficients of the elasticity of the federal taxes in relation to the federal expenditure are different depending on the type of source of tax revenue or tax in question.

Tax Collection, Federal Spending, Fiscal Coordination

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1. Introduction

The fiscal decentralization implies that the national and municipal governments have a greater participation in public spending and, in turn, they are conferred greater tax powers. However, in the Mexican case, local public finances increasingly participate in total public spending, but the same dynamics in terms of generating their own income are not observed.

This work starts by highlighting the problem of research, which is in the field of federalized public expenditure as the net tax collection. Afterwards, the aspects that technical support to research has contributed are exposed. Then we describe the methodology used to check the hypothesis that has been raised. Finally, an exhibition of the results is presented, as well as a presentation of the conclusions of the study.

1.1 Justification

The behavior of the tax collection has effects on the federalized spending that is exercised in the states. However, federal tax revenues are originated from the collection of a variety of taxes. Then, the adjustments made to the rates, the taxable bases and other aspects of each of the tax sources could have different implications for the levels of federalized spending. On the other hand, it is convenient to know what are the implications of the modifications of the components of net tax collection on federalized public expenditure to determine if the current fiscal pact complies with the constitutional principle of proportionality and thus demonstrate the compensatory aspect of federal spending Additionally, the reforms made to the laws and other regulatory schemes in federal fiscal matters must be carried out based on studies that demonstrate the relevance of such adjustments and the consequences they will have on public spending and, therefore, on the country's socioeconomic development.

1.2 Problem

The federal transfers that the central government sends to the states and municipalities in Mexico, within the framework of the National System of Fiscal Coordination (SNCF), assume a double function: compensatory (resarcitoria) and compensatory (compensatoria). The first is linked to the return of public resources that the federal government makes by virtue of the cession of tax powers that subnational governments have made through the fiscal pact; that is, in exchange for the federal government collecting certain taxes in the state territories and that the entities have eliminated the collection of the same on their own account, the local public finances periodically receive federal transfers that form a fundamental part of their ordinary public income.

The compensatory aspect is associated with the purpose of granting greater resources to the regions with greater socioeconomic lags and in this way improving the distribution of national wealth with the objective of reducing horizontal gaps; in other words, to reduce the inequality between the states.

Of course, the compensatory nature of federal transfers implies that the income that has been obtained through tax collection in those entities with lower levels of economic activity, in relation to the rest of the states, are lower than the resources that the federal government transfers to them. This would have to suppose a opposite situation for the entities with greater dynamism and economic growth; that is, in the latter case, the amount of transfers that the central government makes to the subnational treasuries would possibly represent a quantity of resources lower than the federal taxes collected in those states.

On the other hand, public spending that originates in the federal sphere is sensitive to the adjustments that appear in the income from federal tax sources. In other words, the resources that the central government obtains through the collection of direct and indirect taxes determines, to a certain extent, the level of federal public spending applied in the state territories. Additionally, given the fall in production and in international oil prices, public revenues from the sale of crude oil have decreased.

According to data from the Ministry of Finance and Public Credit (SHCP) in 2015, the main components of the federal revenue collection were tax revenues with 86.9% and oil revenues with 13.1%; As for the main parts that make up tax revenues, the source that provides the greatest amount of resources is the income tax (ISR) with 46.3%, the value added tax (VAT) with 34.1%, the special tax on production and services (IESP) participates with 16.6%, taxes on foreign trade with 2.1% and, finally, taxes related to the sale of new cars with 0.5%. By virtue of the above, it is convenient to clarify what are the implications of adjustments in the different components of net tax collection on federalized public spending in Mexico?

1.3 Hypothesis

Federalized public expenditure responds differently to adjustments in the different components of net tax collection.

1.4 Objectives
1.4.1 General Objective

Check the relationship between the most representative components of net tax collection and federalized spending in Mexico during the 2009-2015 period to estimate the elasticities between the main federal tax revenues and the public expenditure applied in the state territories.

1.4.2 Specific Objectives

– Identify the federal entities in which the amount of the net tax collection of federal taxes is greater than the federalized expenditure exercised in those states in nominal terms
– Identify the federal entities in which the amount of the tax revenue net of federal taxes is less than the federalized expenditure exercised in those states in nominal terms.
– Determine the elasticity of the main components of federal net tax collection with federalized public spending.

2. Theoretical framework

There has been a broad debate regarding the functions that each government order must perform in federal systems. In the fiscal aspect, there must be, without a doubt, an integral coordination that allows to make efficient the provision of public goods as well as an appropriate promotion of growth and socioeconomic development.

The decisions that are assumed in tax collection will inevitably have consequences on the economic dynamics of individuals, organizations and, in general, the country. A classic author in the field of public administration, Oates (1968) points out that, just as with people, capital is usually sensitive to the fiscal management that is given in the local territory; therefore, an entity would face the risk that companies that are already operating in its territory could change their location to other regions in case of establishing a strong tax related to productive activity.

The federal government should take charge of mobile income sources as well as those that have a greater redistributive potential; in addition to those resources that are distributed unequally among the states (Flores, 2002).

Public spending is an important instrument to promote economic growth and human development, and the main mechanism available to societies to promote their equity (Scott, 2011: 2). The differences between the tax or fiscal power and the expenditure responsibilities that have been conferred on the three levels of government have led to the emergence of a significant fiscal gap between the federal government and subnational governments in Mexico (Hernández & Villa Sánchez, 2010: 116). This allows us to affirm that public spending, regardless of the governmental order that exercises it (federal, state or municipal), plays a transcendental role in the economy and in society in light of the multiple aspects of the daily life of the inhabitants of any territory that are linked with the application of public resources.

Now it is convenient to elucidate around the question of the income tribunes; that is, from a simple perspective, the federal government exercises public spending, but the amount of this will have to be closely associated with the sources of disposable income. One of them, in fact the most important one, is the tax collection, that is, the public revenues from the exercise of the tax powers of the federal government.

In the Mexican case, the development model implemented in the mid-twentieth century and that was supported by protectionist policies and subsidies generated distortions in the fiscal area causing low taxes to be collected and not all citizens to pay what was due them (Mayer-Serra, 2014: 20). An essential aspect to clarify is the concept of participatory federal collection, which will be the one obtained by the federal government for all its taxes, as well as the mining rights, decreased with the total of the returns for said contributions (Fiscal Coordination Law, 2016). This same legal instrument indicates that the General Fund of Units will be constituted with 20% of the federal tax collection.

In the case of ISR, which by the way is the most important in Mexico for the amount of public revenue it represents for the federal government, it should be for Latin America one of the fundamental pillars of the tax system of the countries of the region; however, its collection potential is almost totally wasted (Corbacho, Fretes & Lora, 2013: 10).

In relation to empirical studies that analyze tax issues and public spending, Cárdenas, Ventosa-Santaulària & Gómez (2008) develop a paper in which they estimate the long-term income elasticity of tax revenues in Mexico; they infer from the analysis the elasticity of the federally-participable collection in relation to the gross domestic product. Among the main results are that the Mexican tax system is not effective in converting economic growth into more public resources for states and municipalities. However, they find that federal transfers do not fall more than proportionately during phases of economic slowdown.

Caballero & López (2012) study the relationships between private investment decisions, tax collection and public expenditure; they use a model with panel data for the period 1998 - 2008. They locate, among other findings that ISR and VAT discourage private investment but the fiscal effect is positive.

3. Methodology

This section describes the methodological aspects of the research.

3.1 Type of research

It is a quantitative and not experimental research. Also given the proposed hypothesis, the study assumes an explanatory nature.

3.2 Data and method

A data panel composed of 224 observations was built, integrating cross-sectional information from the 32 Mexican federal entities for a seven-year time series (2009-2015 period). The dependent variable is the federalized public expenditure, which was made up of the sum of the resources that the federal government exercised in the study period in all the federal entities under the following concepts: federal participations, federal contributions, resources for the health protection, wage provisions and other subsidies, decentralization agreements and reassignment agreements.

The independent variables are represented by the most representative components that make up the net fiscal collection. We used the linear regression technique considering the least ordinary squares method. Additionally, the data were restated in terms of logarithms with the purpose that the coefficients of the parameters can be interpreted as elasticities. The equation that was estimated is the following:

$$GF_{it} = \beta_0 + \sum_{j=1}^{k} \beta_j X_{jit} + \mu_{it} \qquad (1)$$

Where:
GF_{it} is the federalized expense exercised in entity i during year t.
X_{jit} is a vector of independent variables with data for entity i in year t, based on net tax revenues from the collection of ISR, VAT, IEPS, tax on new cars (Autos_N), taxes on foreign trade (Comer_Ext) and Accessories.
μ_{it} = error term
i = entity (i = 1, 2, 3…, 32)
t = year (t = 1, 2, 3…, 7)

In order to control the individual effects, the technique of fixed effects is applied to the cross sections. The maximum likelihood test is used for the redundancy of the fixed effects and thus be able to affirm that the fixed effects of the entities are different.

4. Results

The federal entities in which the net tax collection (RFN) was greater than the federalized expenditure (GF) applied in their territories, in average nominal values for the period 2009 - 2015, are: Mexico City with 740,726 million pesos, New León with 91,798 million pesos, Tamaulipas with 86,995 million pesos and Colima with 29,009 million pesos.

In the rest of the estdaos of the country, that is to say, in 28 federal entities the federalized expenditure was higher than the net fiscal collection. Table 1 shows the descriptive esadistic of the variables that make up the model.

Variable	Average	DS	Range
GF	40,235.8	30,782.9	173,759.8
ISR	28,629.8	94,333.3	714,678.9
VAT	19,194.4	50,963.8	359,631.0
IESP	1,459.5	20,554.1	354,399.4
Autos_N	176.8	241.1	1,497.0
Comer_Ext	957.6	2,088.8	11,322.5
Accessories	704.9	1,505.5	10,824.6

Amounts in millions of pesos DS = Standard deviation

Table 1 Descriptive analysis of the variables

It is observed that the standard deviation of ISR and VAT is greater than that presented by GF. This is expected, as the values of the independent variables can report negative data because it is the net collection; that is, unlike federalized spending, in these cases there are refunds of resources to taxpayers. Mexico City and Nuevo Leon, on the one hand, and the State of Mexico and Chiapas, on the other, are the cases of entities in which the difference between net tax collection and federalized public expenditure reaches extreme and opposite values. according to each state in nominal terms. Graph 1 shows the evolution of these indicators, net tax collection and federalized spending, in Mexico City. Although as of 2012 there was an increase in the exercise of federal public resources applied in this entity, the increase in net tax revenues was 53.6% in the same period.
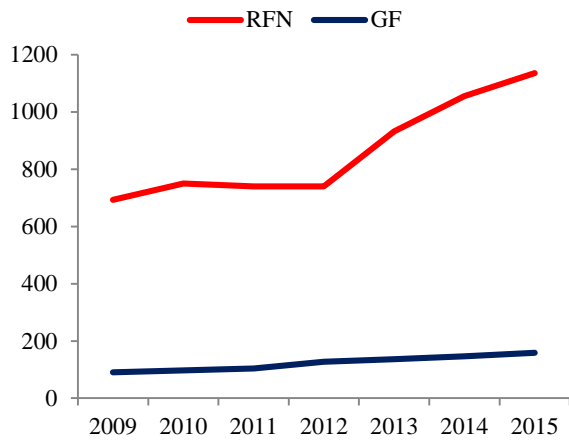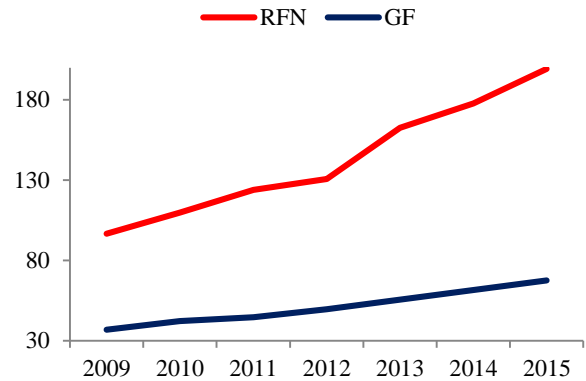
Graph 1 Evolution of the RFN and the GF in Mexico City
Amounts in millions of pesos
Source: Own elaboration with data from the SHCP

In the opposite case, in the State of Mexico a greater amount of federal resources was exercised than those extracted through the collection of taxes. It is appreciated that, despite a fall in tax revenue between 2014 and 2015, federalized spending continued its upward trend. In this entity, the net tax collection had an increase of 70.6% during the study period, while the federalized expenditure reported an increase of 84.0% (see Graph 2).
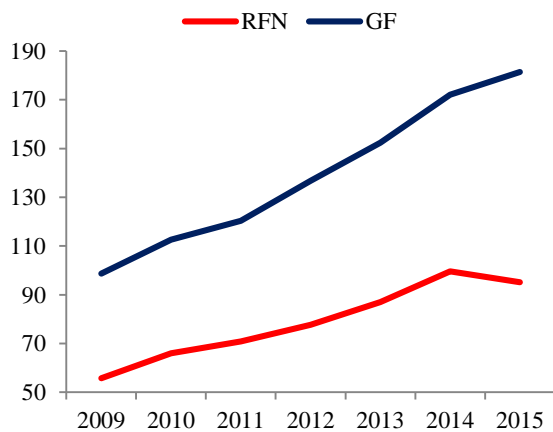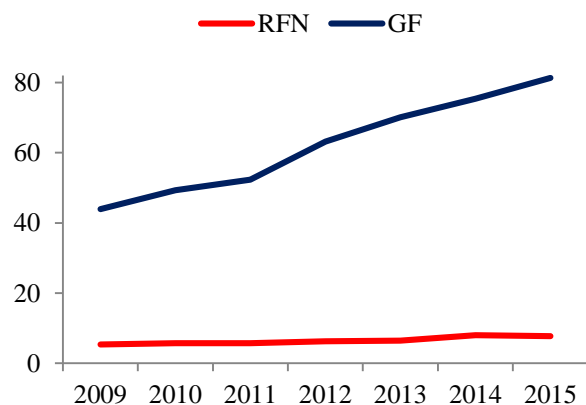

Graph 2 Evolution of the RFN and the GF in the State of Mexico Amounts in millions of pesos
Source: Own elaboration with data from the SHCP

Graph 3 shows that in the case of Nuevo León, as in Mexico City, net tax revenue greatly exceeded the level of federal spending exercised in the Neolonian territory. In the period 2009 - 2015 the application of federal resources in the state increased, in percentage terms, by 83.1%. For its part, net tax revenue increased by 106.2% in the same period.

Graph 3 Evolution of the RFN and the GF in Nuevo León.
Amounts in millions of pesos
Source: Own elaboration with data from the SHCP

Chiapas is the second federal entity at the national level in which the difference between net tax collection and federalized spending is greater. The tax revenues collected by the federation grew, from 2009 to 2015, by 43.9% while the federalized expenditure increased by 84.8% (see Graph 4.)

Graph 4. Evolution of the RFN and the GF in Chiapas.
Amounts in millions of pesos
Source: Own elaboration with data from the SHCP

Table 2 compares the levels of net fiscal collection and federalized spending for the year 2015. The cases of federal entities in which the net tax collection, that is, the tax revenues collected by the federal government in their territories are remarkable. represents a minimum proportion of federalized spending.

In Guerrero, this proportion is 8.2%, that is, for every eight cents that the federal government collects in this state, it exercises 1 peso through federalized public spending. In Chiapas, Oaxaca, Durango, Tlaxcala and Zacatecas that ratio is 9.5%, 9.6%, 9.9%, 11.1% and 11.7% respectively.

Entity	RFN	GF
Aguascalientes	14,607.8	19,421.4
Baja California	54,359.2	43,443.6
Baja California Sur	5,488.3	13,656.5
Campeche	8,111.7	20,596.6
Ciudad de México	1,135,903.1	158,346.3
Chiapas	7,702.9	81,268.1
Chihuahua	46,823.6	44,911.6
Coahuila	26,027.8	36,239.5
Colima	67,015.5	13,534.8
Durango	2,980.0	29,975.9
Guanajuato	29,406.5	64,812.3
Guerrero	4,671.2	56,711.5
Hidalgo	6,431.1	41,893.8
Jalisco	68,127.1	88,585.3
México	95,141.7	181,412.0
Michoacán	54,157.4	58,800.5
Morelos	7,673.4	26,519.6
Nayarit	3,239.6	20,349.0
Nuevo León	199,180.5	67,435.3
Oaxaca	5,948.2	62,238.1
Puebla	25,386.3	76,839.3
Querétaro	24,276.4	26,894.0
Quintana Roo	17,560.7	21,969.7
San Luis Potosí	10,400.0	38,405.7
Sinaloa	29,523.0	43,856.0
Sonora	29,106.2	43,579.5
Tabasco	12,208.7	43,222.4
Tamaulipas	183,422.1	48,206.9
Tlaxcala	2,107.4	18,994.7
Veracruz	175,031.4	100,626.0
Yucatán	11,520.6	30,370.0
Zacatecas	3,144.3	26,940.6

Table 2 Net tax collection and federalized spending by federal entity in 2015 Amounts in millions of pesos RFN: Net tax collection; GF: Federalized spending
Source: Own elaboration with data from the SHCP

Figure 1 shows the proportion that represents the net fiscal collection with respect to the federalized expenditure in 2015 in each federal entity. It is observed that in seven state territories this indicator was higher than 100%. In the case of nine states, this ratio assumed a value between 50% and 99%; in eight it was between 20% and 49% and, finally, in eight other entities the net tax collection represented less than 20% of the federalized expenditure exercised in each of its territories.
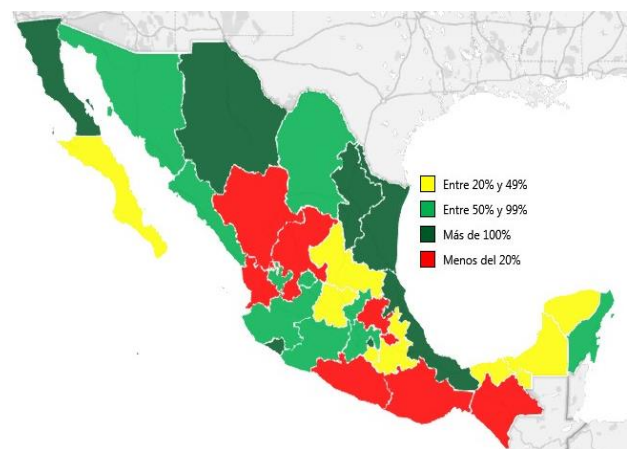

Figure 1 Ratio of net tax revenue to federalized expenditure in 2015
Source: Own elaboration with data from the SHCP

On the other hand, in relation to the coefficients of the regression model, Table 3 shows the results corresponding to the return variables ISR, VAT, IESP, new cars, foreign trade and accessories. It should be noted that, given that the data are expressed in logarithms, the results show the magnitude of the elasticity that each component has with federalized spending.

Variable	Elasticity
ISR	0.458729
VAT	0.067949
IESP	0.001026
Autos_N	0.212933
Comercio_Ext	0.000878
Accessories	0.018803

Dependent variable: Federalized expenditure
Method: Data panel with MCO

Table 3 Elasticities of the components of net tax collection with federalized spending
Source: Own elaboration using EViews 8

According to these results, federalized spending is more sensitive to variations in ISR, in tax revenues generated by the sale of new cars and in VAT. Regarding the measurement of the effects that the changes in tax collection levels cause in federalized spending, it is observed in Table 4 that for every million pesos that income from income tax is adjusted, federalized spending will have to be modified in 280,000 pesos.

As for VAT, an increase in federalized spending of 177,000 pesos per million pesos is estimated, which increases the net collection from this tax. The IESP was not significant; However, because it is a population study, it could be unnecessary to test hypotheses for these coefficients, so it would be assumed that an adjustment of one million pesos in the income generated by this tax would have to modify the cost of the federated 12,703 pesos. Finally, for each million pesos that vary the tax revenues generated by foreign trade, it is estimated that federalized spending varies by two million 133 thousand pesos.

Variable	Coefficient
ISR	0.280729[***]
VAT	0.177186[***]
IESP	0.012703
Comercio exterior	2.133077[**]

[***] = significativo al 99%; [**] = significativo al 95%;
[*] = significativo al 90%
Variable dependiente: Gasto federalizado.
Método: Panel de datos con MCO.

Table 4 Regression coefficients using nominal data
Source: Own elaboration using EViews 8

Con el propósito de asegurar que emplear el método de efectos fijos en las secciones cruzadas es apropiado se aplica el test de máxima verosimilitud (ver Tabla 5).

Fixed effects test	Elasticity model		Model of effects	
	Statistical	Prob.	Statistical	Prob.
F	131.49	0.000	60.9992	0.000
Chi-square	587.95	0.000	536.9932	0.000

Tabla 5 Pruebas redundantes de efectos fijos en las secciones transversales

By virtue of the above (p-values less than 0.01) it can be affirmed that the fixed effects of the states are different with 99% confidence, which guarantees that controlling the individual effects in the cross sections is pertinent and methodologically acceptable.

5. Conclusions

The study of public finances reveals the need to have permanent, updated and methodologically appropriate analyzes of the reality of public revenues and expenditures. In this case, the work addresses aspects of the behavior of net tax collection in Mexican federal entities as well as the federalized spending that is exercised in them.

We identified those cases in which the federal government applies a lower amount of public expenditure than the amount of resources it collects. However, it is convenient to clarify that some situations have a clear explanation about these differences. For example, in Mexico City there is the tax domicile of a large number of taxpayers even when they locate their production plants in other entities. The same happens with Tamaulipas because of its condition of being part of the border and something similar happens in Colima, when receiving a large amount of products from Asia.

It also detected those entities in which federalized spending is, by far, higher than the net tax collection. This could revive the debate about the inequity that exists in terms of exercising federal resources in the state territories in relation to the tax revenues they generate. However, it is pertinent to emphasize the compensatory qualities of federal transfers; that is, contribute to the reduction of gaps between the regions. On the other hand, the central hypothesis of the study was tested, which proposed that the sensitivity of federalized public spending with respect to the main components of net tax collection was different.

The results show that, effectively, federalized spending maintains a different elasticity with each of the sources of tax revenues that represent the different types of taxes Finally, given the findings located in this paper, it is suggested the development of studies on the behavior of net tax collection and its relation to the local circumstances of each federal entity in order to clarify whether the socioeconomic reality explains the level of federal tax revenues generated or, failing that, there are areas of opportunity in the actions of control and control by the competent authorities.

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