

AUTONOMY AND SUBNATIONAL
FINANCIAL DEPENDENCE.
EVIDENCE FOR A LOCAL
DEVELOPMENT POLICY IN MEXICO

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Paul Eduardo Jiménez López
lalo_870624@hotmail.com

UNIVERSIDAD AUTÓNOMA DE CHIAPAS, MÉXICO.



To quote this article:

Jiménez- López Paul. (2018) Autonomía y dependencia financiera subnacional. Evidencias para una política de desarrollo local en México. *Espacio I+D Innovación más Desarrollo*, 7(18) 117-130. Recuperado de: <http://dx.doi.org/10.31644/IMASD.7.2018.a06>

— *Abstract* —

The purpose of this article is to analyze the relationship and impact autonomy and financial dependence has had on Gross Domestic Product (GDP) per head of subnational government in Mexico. Economic growth is not enough for the creation of local developmental processes. However, it is a necessary condition that may encharge actors of local politics to consider detonating real developmental processes and improve living conditions of society. The research propose two indicators of autonomy and subnational financial dependency. In addition, econometric models were created using the methodology of data ordered in panel to analyze the impact about the product per person. In essence, it conclude that there is statistical evidence at an international level about the importance of financial autonomy in economic activity as well as mexican cases it observed in the same variables.

Keywords

Financial autonomy; financial dependence; local development policy.

At the beginning of the 1980s, Mexico experienced important changes in several sectors of the national economy. In 1978, former President José López Portillo enacted the Fiscal Coordination Law in order to share tasks of revenue collection and distribution of spending between the federal government, state and municipal authorities (World Bank, 2006). The objective was to build a more cooperative federalism among the three levels of government and to address more efficiently the most important needs of society; however, the indicators of poverty and social wellbeing currently challenge the local development policy that has been implemented in the country. According to the National Council for the Evaluation of Social Development Policy (CONEVAL, 2013) in 2012, 61.2% of the population in Mexico did not have social security and approximately 45.5% of the population was in poverty.

There is evidence that shows that in Mexico a process of decentralization of public spending has been carried out maintaining a strong centralism of the main taxation powers, that is, subnational governments have limited themselves in the collection of resources and have become dependent on transfers from the federal government. Contrary to the logic of the Mexican model, the focus of local development focuses on the strengthening of local autonomy and the active participation of territorial actors in the design and implementation of development policies, in this sense, for Arocena (2002) it is important that decentralization reforms provide sufficient degrees of autonomy that allow local actors to efficiently manage their own resources; in other words, local autonomy is a fundamental condition of development and therefore a key element to improve the quality of life of the population.

For the local development approach, the efficient and timely intervention to the social demands in the territories requires a greater endowment of subnational financial autonomy. Financial autonomy is understood as the ability of subnational governments to have sufficient own resources and cover the needs of spending in their respective jurisdictions, in other words, financial autonomy means the existence of own resources on the one hand and the ability to make decisions on the use of those resources on the other. According to Cabrera and Lozano (2010), to speak of financial autonomy in subnational governments implies, in advance, to identify the taxes on those with regulatory capacity and the relative importance they have over total income, in this same sense Inza (2004) defines the concept of financial autonomy as follows:

Financial autonomy implies freedom of decision on the part of the local government regarding the destination of its resources and the structure of its

expenses, the possibility of deciding on the total volume of disposable income and distribution of the tax burden among the taxpayers and the power to arrange operations of Treasury, borrowing in the medium and long term in order to finance investments (page 23).

The purpose of this research is to analyze the relationship and impact of autonomy and financial dependence on GDP per capita in the states during the period 1997-2012. While it is true that development is a much broader concept, it is also true that economic growth is a necessary condition for development, therefore, for practical purposes of research, GDP per capita has been considered as a proxy variable that allows analyzing local development processes in subnational governments of Mexico.

The article is structured in three general sections, the first of which deals with the methodological aspects and the variables used in the development of indicators of autonomy and financial dependence. In the second section the results obtained in the econometric models are presented from the data and the indicators proposed in the research, finally, the conclusions generated are mentioned based on the theoretical and conceptual expositions.

METHODOLOGY

The results and reflections of the research were generated from the development of a quantitative methodology that consisted basically of two stages. In the first stage, two proxies indicators of autonomy and subnational financial dependence were developed with data displayed by the National Institute of Statistics and Geography (INEGI, 2015). In the second stage, two econometric models were elaborated with data ordered in a panel, one of them analyzes the case of the subnational governments of the countries of the Organization for Economic Cooperation and Development (OECD, 2015) and the second model analyzes the indicators of autonomy and financial dependence as independent variables and the subnational GDP per capita as a dependent variable.

$$\text{Financial Autonomy Index} = (\text{own income} / \text{Total expenditure}) * 100$$

$$\text{Financial Dependency Index} = (\text{Transfers} / \text{Total Expense}) * 100$$

According to Gujarati and Porter (2010), econometrics makes an abstraction of reality through statistical methods that are combined with economic sciences and mathematics. Within econometrics itself there are different research methodologies such as cross-sectional models, co-integration

analysis in time series models and panel data models; for this research, the data grouped in panel methodology was used since it has the advantage of combining cross-section and time series models, therefore, they are models that help explain the behavior of the variables better; in addition, panel-type models have a great advantage over cross-sectional and time-series models since they work with a greater number of statistical data due to their two-dimensional character (time and space). As with conventional models, panel grouped models are usually expressed in linear regressions such as the following:

$$Y_{it} = \alpha_{it} + \beta X_{it} + U_{it}$$

Where Y is the endogenous or explained variable and X to Xn the exogenous or explanatory variables, that is, is the ith observation at t time for the K independent variables. In the same way the term (i) represents the transverse units, (t) time. (α) Intercept vector, (β) vector of K parameters and finally (Uit) represents the error term in the model. There are three important specifications in the models grouped in panel, these can be fixed effects, random or dynamic models, the choice between one or another model will depend on the nature of the data that is available; however, the researcher can perform statistical tests that will allow them to choose the appropriate model (Hausman Test).

Table 1 describes each of the variables that were used in the model for the case of subnational governments members of the OECD. This organization is composed of thirty-four countries, however, seven countries were not considered in the model because they had partial or no information for the period of analysis, these countries were Australia, Chile, Turkey, Estonia, Iceland, Korea and Poland.

Table 1. Variables included in the model for OECD countries

Variables	Denotation	Measurement Unit	Period
GDP per capita.	Log (GDPpc)	Constant 2005 prices in US dollars.	2006 - 2010
Consolidated revenues of subnational governments.	Log (CR)	As GDP percentage	
Income of transfers from subnational governments.	Log (TR)	As GDP percentage	

Source: Own elaboration

For the OECD, the consolidated revenues of subnational governments are defined as total revenues minus transfer income. For the purposes of this research and given the existing information, the consolidated revenues were taken as a percentage of GDP as a proxy variable of the indicator of financial autonomy prepared for the states in Mexico, in the same way, transfers as a percentage of GDP represent a proxy of the index of financial dependence.

Table 2 contains the variables that were used to model the behavior of the indicators of autonomy and financial dependence that were previously constructed for the case of subnational governments in Mexico. Unlike the OECD model, each explanatory variable was run separately resulting in three different models. The reason for independently analyzing each indicator in relation to GDP per capita was basically due to two reasons, on the one hand to avoid problems of multicollinearity and autocorrelation but also because of the characteristics of the indicator of financial dependence since this can be divided into participations (branch 28) and contributions (branch 33).

Table 2. Variables included in the models used for the states

Variables	Denotation	Measurement Unit	Period
GDP per capita.	Log (PIBpc)	Constant 2008 prices in Mexican pesos	1997 - 2012
Index of financial dependence with respect to federal participations.	IDF28	From 0 to 100 %	
Index of financial dependence with respect to federal contribution.	IDF33	From 0 to 100 %	
Index of financial autonomy	IAF	From 0 to 100 %	

Source: Own elaboration

RESULTS

In 1992, there was a considerable decrease in the financial autonomy indicator of subnational governments in Mexico, while the national average was 8.68% during the period from 1990 to 2012. These low levels are the result of the decentralization policies of public expenditure that occurred at the beginning of the 1990s, specifically with the decentralization of education and health services. The fall in the financial autonomy index is not the result of lower revenue collection from the states, it is rather the result of increased decentralized public spending, in other words, subnational governments acquired new responsibilities in the provision of important services for the development of their jurisdictions but this process was not accompanied by greater responsibilities in terms of tax collection.

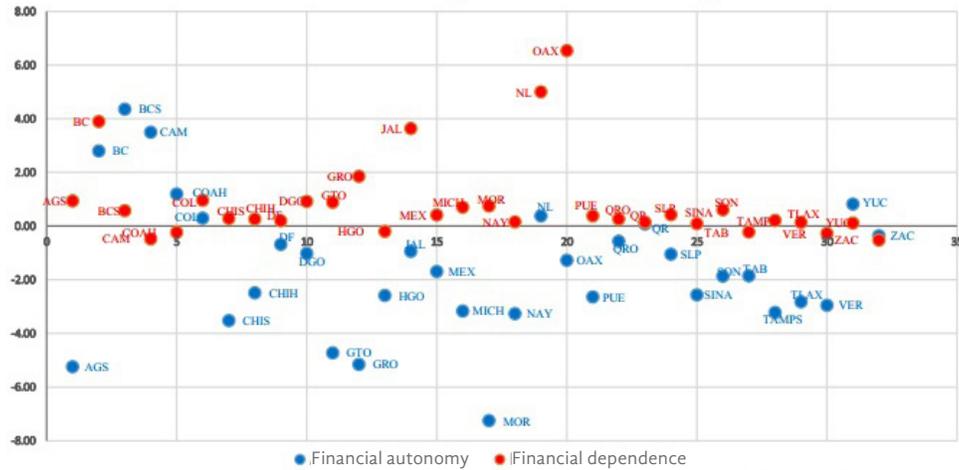
On the side of the financial dependence indicator, there was a considerable growth in 1994 and a high annual average of 81.1% during the period 1990-2012. In these same years, the behavior of the growth rates of the financial autonomy indicator was negative (-1.5%) while that of the financial dependency indicator showed a positive growth rate (0.8%).

On average, the states with the highest financial autonomy index were Chihuahua (17.2%), Quintana Roo (12.0%) and Nuevo León (11.6%) and the states with the lowest autonomy were Oaxaca (3.1%), Tabasco (4.2%) and Guerrero (5.2%). In contrast, the states with the highest rate of financial dependence in the analyzed period were Tabasco (90.6%) and Zacatecas (89.7%), while Nuevo León (58.2%) and Baja California (62.3%) were the entities with the lowest financial dependency with the resources transferred by the central government.

If the average growth rate of both indicators is analyzed and for each federal entity, the state financial trend that has been developed under the tutelage of the current National System of Fiscal Coordination is observed. Based on chart 1, most states present a negative average growth rate of the financial autonomy index (blue dots); the only states that have increased their financial autonomy have been Baja California Sur, Campeche, Baja California, Coahuila, Nuevo León, Colima, Yucatán and slightly Quintana Roo.

The red dots indicate the average growth rate of the financial dependency index by states. Here we see positive growth, that is, the financial tendency of the states has been increasingly dependent on federal transfers, in this tenor, Oaxaca has been the state with the highest indicator growth while Coahuila, Campeche, Hidalgo, Tabasco, Veracruz and Zacatecas had a decreasing indicator.

Graph 1. Autonomy and Financial Dependency by federal entity Index
(average growth rate 1990-2012)



Source: Own elaboration with INEGI data

In order to obtain the values of each parameter in the models it was first necessary to elaborate the Hausman Test and in this way to determine the characteristics of the data, in all cases the null hypothesis (Ho) was rejected and the alternative hypothesis was accepted (Ha), that is, of fixed effects. It is also important that for all cases the Durbin-Watson statistic was close to two, therefore, it is possible to ensure that the data do not present autocorrelation problems.

Estimated model for subnational governments in countries members of the OECD:

$$\text{Log (GDPpc)} = 9.998485 + 0.106428 \text{ Log [CR (-1)]} - 0.073935 \text{ Log [TR (-1)]}$$

Table 3. Statistics of the model used in the subnational governments of the countries members of the OECD

Observations	Hausman Test	R ²	p-value	Durbin-Watson
125	Ha = Fixed effects	99.38%	Log [CR(-1)] = 0.0019 Log [TR(-1)] = 0.0072	1.76

Source: Own elaboration

To carry out the estimation of the model it was necessary to delay a period (-1) to the explanatory variables, this is generally due to the fact that the impact of transfers and consolidated revenues on GDP per capita are not generated in the same fiscal year. On the other hand, the model used a level of significance of 5%, resulting in the exogenous variables being statistically significant. The variable Log [CR (-1)] has a positive coefficient, in other

words, the model maintains a direct relationship between consolidated revenues as a percentage of GDP and GDP per capita for the case of OECD countries, i.e., an increase of one percentage unit of consolidated revenues as a percentage of GDP would be causing an increase in GDP per capita of 0.10%. The previous argument takes great relevance when affirming that there is empirical evidence to strengthen the levels of financial autonomy in subnational governments.

Contrary to what happens with consolidated revenues as a percentage of GDP, the variable $\text{Log} [\text{TR} (-1)]$ has a negative coefficient, that is, the 1% increase in transfers as a proportion of GDP in member countries of the OECD causes a decrease in GDP per capita of 0.07%. It is important to be clear that the inverse relationship between both variables does not support a policy that goes against the transfer schemes and in favor of a centralized system; however, this inverse relationship can be explained through the fundamental principles of transfers. The resources provided by centralized governments are intended to complement and strengthen subnational budgets and in no case should be seen as a substitute for the collection responsibility of subnational governments.

In the methodological part of this work, the reasons for which it was decided to disaggregate the data and generate three explanatory models were pointed out. The first regression (1) relates the GDP per capita variable according to the indicator of financial dependence that only considers non-labeled transfers, that is, the federal participations in the branch 28; the second regression (2) analyzes again the GDP per capita in terms of federal contributions or also known as branch 33 and finally, the relationship between the product per person and the indicator of financial autonomy in subnational governments is analyzed (3).

Estimated models for subnational governments in Mexico:

$$\text{Log} (\text{PIBpc}) = 11.48527 - 0.001269 \text{ IDF28} (-1) \dots \dots \dots (1)$$

$$\text{Log} (\text{PIBpc}) = 11.40602 + 0.000709 \text{ IDF33} (-2) \dots \dots \dots (2)$$

$$\text{Log} (\text{PIBpc}) = 11.43695 + 0.001913 \text{ IAF} (-1) \dots \dots \dots (3)$$

Table 4. Statistics of the models used for subnational governments in Mexico

Observations	Hausman Test	R ²	p-value	Durbin-Watson
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420	Ha = Fixed effects	99.19%	IDF28 (-1) = 0.0028	1.94
390	Ha = Fixed effects	99.16%	IDF33 (-2) = 0.0381	1.97
420	Ha = Fixed effects	99.17%	IAF (-1) = 0.0580	2.01

Source: Own elaboration

The explanatory variable presented a p-value below 0.05 providing us with security to accept the coefficient of -0.0012, note that it has also had to lag behind a period (-1). According to the results of the regression we can say that the indicator of financial dependence with respect to federal participations bears an inverse relationship with GDP per capita in such a way that if the IDF28 in a state increases by 1%, the income per person of this same entity would be reduced by 0.0012%.

In regression (2) a positive coefficient was observed for the indicator of financial dependence with respect to federal contributions, using a two-year lag (-2), therefore, an increase of 1% of IDF33 (-2) would cause an increase in GDP per capita of 0.000709%. Unlike what the IDF28 presented, here you can see a progressivity on the part of the resources of the branch 33, that is, the objective of these resources has been to compensate and reduce the disparities between the states through promoting greater equity in Access to services such as education and health.

Finally, the results obtained from the regression (3) show us the existence of a direct relationship between the financial autonomy index and the GDP per capita in the states. Increasing the indicator of financial autonomy of entities in a percentage unit could mean an increase in GDP per capita of 0.0019%, which would be even higher than the increase of 1% of federal contributions, in this context, it is important that states assume a greater fiscal responsibility by increasing their own income and reducing the financial dependence that has maintained on federal transfers.

CONCLUSIONS

The processes of local development are accompanied by the direct participation of the most important actors in society. The government is an important actor in the detonation of development but not the only one, in this sense, the participation of society is fundamental to make transparent the public resources managed by the states and which are aimed at promoting the development of their regions. For the local development approach it is important to increase the financial autonomy in terms of collection and the ultimate goal

of resources, in this regard, economic growth plays an important role since without this it would not be possible to finance local development policies.

Empirical evidence at the international level shows the impact that financial autonomy has on economic growth and, therefore, on development. The estimated model for the case of subnational governments in OECD countries presented two important parameters, the first of which was the parameter that accounts for the inverse relationship between transfers and GDP per capita, but this did not happen with consolidated revenues (financial autonomy) since it presented a direct positive relationship with the product per person; that is, the parameter of the variable $\text{Log} [\text{CR} (-1)]$ means that financial autonomy in OECD countries has been important in the growth and socioeconomic development.

In the case of subnational governments in Mexico, behavior similar to that of the OECD countries was observed. Federal participations (branch 28) presented a negative parameter in relation to GDP per capita by state; however, for the case of federal contributions was the opposite, that is, the increase in resources from branch 33 has had a positive impact on GDP growth per capita. More important has been the value of the parameter that showed the indicator of financial autonomy that besides being positive, was greater than the parameter of the federal contributions, in this sense, a proposal to increase the financial autonomy of the subnational governments could mean a first step towards true processes of local development. In the not too distant future it will be necessary to include in the public agenda a local development policy that considers the increase of subnational autonomy.

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