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# Determinants of Subnational Tax Collection in Federal Contexts: A Case Study of Mexico

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## Abstract

The study of taxation is essential to understanding the processes that encourage or hinder revenue collection. In Mexico and other federal countries, subnational governments may levy certain taxes, yet revenue outcomes vary considerably. This research identifies the determinants of subnational tax collection in Mexico, focusing on characteristics of the collecting authority, socioeconomic factors, and the degree of governmental independence. Data on state-level public revenues were obtained from primary sources: financial authorities, treasuries, and state auditing bodies. The analysis employed multiple linear regression based on significant correlations among the studied variables. Findings indicate that the total number of businesses established in every state, number of reported salaried employees, as well as tourism infrastructure (measured by the number of hotel room-nights occupied annually) are associated with fiscal effort. Results show that Mexican states collect less than their counterparts in other federal countries due to restrictions in the legal tax system, and that their fiscal effort has seen minimal growth over the past decade.

## Keywords

Fiscal Effort, Optimal Taxation, State Revenue, Mexico

## 1. Introduction

In general terms, and taking into account the various meanings of these concepts, the study of taxes, levies or contributions is essential across all regions of the world, as public expenditure in each country depends on them (Aboites Aguilar, 2019; Kalaš et al., 2020; Piancastelli & Thirlwall, 2020; Chang et al., 2020). Tax collection—a generic term used throughout this study—is influenced by a wide range of factors. In particular, research focused on understanding the tax collection process tends to highlight three main components, as noted by Aguilar Gutiérrez (2010),

Chávez Chávez (2016), Segura Ronquillo & Segura Ronquillo (2017), Kalaš et al. (2020), Kaldor (2021), Quispe Alvarez (2021), Usman & Landry (2021), Bolaños & Franco (2021), and Wijaya & Dewi (2022), which are described below.

First, there are administrative limitations of the collecting agency, including infrastructure size and workforce capacity, as well as the use of technology, transparency, and the efficiency of its management. The second component refers to socio-economic factors such as market size, the economic structure of the region or country, the tax base, informality, and even the level of urbanisation in the area studied. The third component concerns the coercive power of the collecting authority—namely, its level of decentralisation in relation to the national taxation system (in the case of regional authorities), and its capacity to implement and collect its own taxes.

Due to its social, economic and political significance, the study of taxation is vital to understanding the processes that either promote or hinder tax collection. A clearer understanding of these factors may contribute to optimising the tax system and enhancing coercive collection mechanisms (Piancastelli & Thirlwall, 2020; Chang et al., 2020). This research aims to identify the determinants of tax collection and fiscal effort at the subnational level in Mexico, given that taxation capacities vary across the three levels of government. Acknowledging this reality could provide relevant insights into the strengths and weaknesses of the Mexican tax collection system and facilitate comparisons with other world regions. This work offers a valuable contribution, as few recent studies have addressed tax collection at the subnational level.

The study identifies several elements commonly referenced in the literature on national tax collection. In particular, the tax base was measured by the number of registered businesses in each Mexican state and their respective workforces. Regional goods production, workforce rates and urbanisation levels were drawn from primary sources. Variables were compared using simple correlations and linear regression analysis. All data were obtained from public subnational databases, focusing on the period from 2010 to 2019 due to availability. The year 2020 was intentionally excluded owing to the economic distortions caused by the COVID-19 pandemic in most countries. Once the relevant factors had been identified, figures and graphs were produced to illustrate the evolution of tax collection levels.

The structure of the paper is as follows: the first section reviews the relevant literature, focusing on the key components related to tax collection and the structure of the Mexican tax system. The second section outlines the methodology, which relied on quantitative data and parametric tests. This is followed by a presentation and discussion of the main findings, and the paper concludes with the author's final reflections.

## 2. Literature Review

### 2.1. Factors Affecting Subnational Tax Collection

Tax collection is an everyday phenomenon that has a decisive influence on public

finances and constitutes a central theme in fiscal research, which seeks to understand its behaviour. Several factors affect tax collection, as highlighted in the specialised literature. Favila Tello & Armas Arévalos (2018) argue that there is no consensus on the determinants of tax collection and suggest a multidisciplinary approach to its analysis.

**Administrative limitations**

The first component is the administrative capacity of the tax collection agency, which is crucial to achieving better tax collection in the states (Guillermo Peón & Vargas Casimiro, 2017); this includes the number of agency employees and the budget allocated to collection tasks, as well as the level of digital technology implemented to address the challenges of the current environment (such as the large volume of information). This capacity of tax agencies faces limitations in its study within the Mexican subnational context due to the scarcity of publicly available information: as Sobarzo (2006) and Martínez Sánchez & Cano Moreno (2022) pointed out, differences in technological infrastructure, human resources, and digital platforms make accurate comparisons difficult; while Peredo (2022) offers a compilation of differences in Mexican state administrative structures, Chang et al. (2020) provide relevant evidence at the international level. Therefore, this study focuses primarily on factors related to the other two components, for which more consistent information was available.

**Socioeconomic Factors**

**Market Size**. The most commonly used indicator for assessing the production and economic growth of a country is Gross Domestic Product (GDP), which is associated with tax collection, as the circulation of goods produced within a territory is often taxed at various stages: production, initial sale, intermediate distribution, and final consumer sale. Thus, production represents a factor associated with taxes (Segura Ronquillo & Segura Ronquillo, 2017; Aboites Aguilar, 2019; Bolaños & Franco, 2021; Wijaya & Dewi, 2022). GDP, particularly in its manufacturing component, has been significantly linked to tax collection; Minh Ha et al. (2022) find this correlation, previously documented by Kalaš et al. (2020), who estimate that a 1% increase in the GDP of the Eurozone could lead to almost a 7% rise in tax revenue. Market size can also be identified with the number of businesses in a given region, as population growth leads to greater demand for goods and services, which can be met by foreign direct investment (FDI) or new local capital industries that increase production and promote economic growth, thus raising tax revenue (Wijaya & Dewi, 2022).

**Employment and Wages**. The number of economic activities has also been found to be related to employment (Aranda Blanco et al., 2023), which, in turn, is linked to tax collection as it promotes job growth by expanding employment opportunities. Segura Ronquillo & Segura Ronquillo (2017: p. 35) assert that the circular flow generated by economic activity channels part of the resources from companies to production factors, such as workers' wages, and also helps create new jobs. Furthermore, as workers' skills and knowledge improve, their wages in-

crease, and so do payroll taxes and revenue collection (Favila Tello & Armas Arévalos, 2018). For example, salaried individuals in Mexico contribute up to 10.2% of their earnings in Income Tax (ISR) in the top decile (SHCP, 2022).

**Urbanisation**. Studies have also shown that in rural areas, the consumption of goods and services tends to be low, but increases with urbanisation, which in turn leads to higher tax revenues as a result of greater expenditure (Terefe & Teera, 2018; Bolaños & Franco, 2021). Moreover, urbanisation is associated with higher employment in industry and the services sector, which also fosters greater participation in the formal labour market and contributes to increased revenue collection (Ahmad et al., 2016).

**Factors Related to the Collecting Authority**

This category includes two key factors attributable to the regional tax authority: the degree of autonomy it has relative to the federal authority and its capacity to establish new taxes.

**Tax Autonomy or Authority**. In federal systems, power and key economic and political decision-making are distributed between the central government and subnational units—such as states or regions—which enjoy a significant degree of autonomy. In contrast, centralised regimes are characterised by a more concentrated public administration, in which subnational entities possess considerably more limited political decision-making capacity. In Mexico, state governments are heavily dependent on federal transfers, which represented 81.2% of their total income in 2023, while only 15.5% came from their own or external taxes, in addition to debt income (IMCO, 2024). Many of these transfers are earmarked for specific purposes, restricting local governments' ability to adjust their budgets according to local needs (Aranda Blanco et al., 2023). A higher degree of tax autonomy could improve efficiency by allowing fiscal design to be more aligned with local conditions.

**Number of Own Taxes**. In Mexico, federal revenue is the largest in terms of the number of taxes collected, followed by state revenue, and finally municipal revenue, which is limited to property taxes. While subnational tax authorities do have the power to establish their own taxes, this power is considerably restricted for subnational authorities; furthermore, some governments grant tax exemptions to attract investment, which further limits the possibility of increasing revenue (Aranda Blanco et al., 2023). According to Kaldor (2021: p. 1243), tax administration tends to be inefficient when there are too many low-yield taxes, leading to limited revenue collection in these countries. While a higher number of taxable activities is usually associated with greater revenue, this pattern does not always hold; also, some taxes can be highly effective as payroll tax in Mexico, which by itself represents a significant portion of revenue in almost all states, as well as the vehicle ownership tax, which, although abolished in several states since 2019, had been the main source of revenue for regional tax administrations since 1962.

In summary, the conditions surrounding government tax enforcement, the local economic reality, and the coercive power of the tax authority are the key de-

terminants that shape the measurement of fiscal effort.

## 2.2. The Mexican Tax Collection System

Mexico is a country located in North America, south of the United States and north of Guatemala and Belize, with a territorial area of just over two million square kilometres. Its political regime is federal, and it is composed of 32 states, which are further divided into more than 2200 municipalities. In 2024, the estimated population is 132.3 million people. The country ranks 14th globally by GDP size, 13th in total exports, and 6th in international tourism, with over 45 million tourist arrivals.

In the Mexican governance system, tax collection is highly centralised, with federal revenue surpassing state and municipal collections (Vázquez Soto & Moreno Ayala, 2012; Aboites Aguilar, 2019; Bolaños & Franco, 2021; Aranda Blanco et al., 2023). While this centralisation is not unique to Mexico—since many nations have central governments that collect the bulk of tax revenue—subnational governments in Mexico raise relatively little revenue. In 2021, only 8.6% of their income came from their own taxes, which represented just 0.69% of the Gross State Product (GSP), a figure significantly lower than the average observed in other countries (Aguilar Gutiérrez, 2010; IMCO, 2021). **Table 1** illustrates the total revenue collection, both fiscal and non-fiscal, as well as the own revenue collection of subnational governments in various countries in that same year, which allows for the contextualisation of Mexico's performance in the international scenario.

**Table 1.** Subnational governments' Tax revenue as percentage of GSP, in 2021.

| Country | State revenue | Taxes revenue[a] |
|---|---|---|
| Australia | 13.60 | 4.59 |
| Brazil | 13.40 | 7.98 |
| Canada | 21.90 | 12.70 |
| United States | 17.40 | 9.45 |
| Indonesia | 1.90 | 1.84 |
| Mexico | 8.60 | 0.69 |
| Paraguay | 0.40 | 0.35 |
| Peru | 4.83 | 4.80 |
| Russia | 16.10 | 7.85 |
| South Africa | 10.70 | 10.47 |

[a]Only taxes, excluding social security contributions, grants and others. Source: Author's own elaboration with IMF (2024) data.

The revenue that can be collected by each of Mexico's three levels of government is summarised in **Table 2**, based on the powers granted by the Mexican Constitution. The distribution of these fiscal powers by government level has been

extensively analysed by García Pureco & Herrera Aguilar (2023). As can be seen, the limited number of taxes allowed for states and municipalities directly leads to lower levels of revenue collection. Consequently, since the 1970s, federal transfers have become the primary source of income for subnational governments.

**Table 2.** Classification of tax collection by level of government in Mexico.

| Tax incomes[a] | Type | Federal | State | Municipality |
|---|---|---|---|---|
| Taxes | Income Tax (ISR) for companies | ✓ | | |
| | Income Tax (ISR) for individuals | ✓ | | |
| | Value Added Tax (IVA) | ✓ | | |
| | Tax on Goods and Services (IEPS) | ✓ | | |
| | Foreign trade | ✓ | | |
| | Payroll tax | | ✓ | |
| | Vehicle ownership | | ✓ | |
| | Lodging | | ✓ | |
| | Property tax | | | ✓ |
| Fees | | ✓ | ✓ | |
| Profits | | ✓ | ✓ | |
| Social security contrib | | ✓ | | |
| Other contributions | | ✓ | ✓ | |

[a]According to classification of contributions in Mexican Laws. Source: Author's own elaboration.

The three main taxes in Mexico—Income Tax (ISR), Value Added Tax (IVA), and Special Tax on Production and Services (IEPS)—are collected exclusively by the federal government. The remaining contributions, which are of lower value, are managed by state and local governments. However, through the National System of Fiscal Coordination (SNCF, Sistema Nacional de Coordinación Fiscal), created in 1979, the federal government transfers a significant portion of the collected resources to states and municipalities, which, despite their limited revenue-raising powers, are responsible for over half of national public spending (Sobarzo, 2006; Chávez Chávez, 2016; Bolaños & Franco, 2021; IMCO, 2021). These federal transfers—referred to as participations and allocations—stem from fiscal agreements and are only partially linked to the GSP; they may also be conditional or non-conditional. In some cases, this framework has led to a phenomenon known as "fiscal laziness", which is a lack of interest attributable to inefficiency or irresponsibility and discourages subnational governments from increasing their own revenue collection (Sobarzo, 2006; Aguilar Gutiérrez, 2010; Guillermo Peón & Vargas Casimiro, 2017; Quispe Alvarez, 2021).

## 3. Methods

This econometric study involves an analysis of regional tax collection in Mexico. The unit of analysis comprises the public revenues of state governments, based on administrative records compiled by the National Institute of Statistics and Geography (INEGI, 2024a, 2024b, 2024c, 2024d, 2025). These records are obtained directly from primary informant sources, such as financial authorities, state treasuries, and audit offices. All figures are expressed in the national currency (Mexican pesos: MXN). The geographic scope of the study is national, as it includes data from all Mexican states. As suggested by various authors, a range of indicators should be included to identify which ones have a direct effect on the response variable. Accordingly, based on the classification of taxes in Mexico, the analytical variables used in this study are presented in **Table 3**.

**Table 3.** Variables used in the study.

| Code: | Definition | Description | References |
|---|---|---|---|
| Variable | Dependent | | |
| TR | Own-source tax revenue | Revenue collected from the state's own tax sources. | Sobarzo (2006); Vázquez Soto & Moreno Ayala (2012) |
| FE | Fiscal effort | Own-source tax revenue as a percentage of State Gross Domestic Product (GSP). | Sobarzo (2006); Vázquez Soto & Moreno Ayala (2012) |
| Variable: | Independent | | |
| URB | Urbanisation rate | Percentage of population living in urban areas relative to total state population. | INEGI (2024a) |
| EMP | Registered businesses | Total number of businesses established in the state. | INEGI (2024b) |
| PERS | Remunerated personnel | Number of reported salaried employees in the state. | INEGI (2024b) |
| LFP | Labour force participation rate | Ratio of the total active labour force to the working-age population (15 - 64 years). | INEGI (2024c) |
| VEHIC | Motor vehicles | Total number of registered vehicles in the state. | INEGI (2024d) |
| ROOMS | Hotel rooms | Total number of hotel room-nights occupied annually. | SECTUR (2025) |

Source: Author's own elaboration.

The central hypothesis of this study is that the tax revenues of Mexican states are positively influenced by each of the proposed independent variables. To measure fiscal effort (FE), the Equation (1) proposed by Vázquez Soto & Moreno Ayala (2012: p. 140) and translated from the original spanish work by the author was applied.

$$FE\,i = TRi/GSPi \quad (1)$$

where *FE* represents the fiscal effort of state *i* during the period; *TR* is the tax revenue for the same period and state *i*; and *GSP* denotes the gross product for state *i*. The index *i* corresponds to each of the 32 Mexican states.

As a first step, the following information was compiled: the own-source tax revenues of all 32 states for the period 2010-2019. These values were deflated using 2020 as the base year (index = 100). GSP data were obtained from INEGI (2025) at 2020 constant prices for the same years. Additional data for the predictor variables were only available for specific years, depending on data availability from INEGI (2024c) and the Secretariat of Tourism (SECTUR, 2025). The urbanisation rate was available for 2010 and 2020, corresponding to census years. The number of businesses, referring to all economic units engaged in the production of goods or services, was sourced from the economic censuses: for the 2013 census (data as of December 2012) and the 2019 census (data as of December 2018). The number of employed and remunerated personnel under the business name was available for the same census years. Total labour remuneration, which includes wages, benefits, and employer contributions to social security, was also obtained from the economic censuses. Labour force participation was measured as the number of people working in non-business family economic units, available for 2010, 2015, and 2019. The number of registered motor vehicles—including cars, trucks, and motorcycles—was available annually for the entire 2010-2019 period. The number of hotel rooms was preferred over tourist arrivals, since a lodging tax is charged in most states. This variable refers to the total number of room-nights occupied in the year 2019, the first year for which this indicator was produced.

The collected data were entered into a table and processed using SPSS software, version 28. The reliability and adequacy of the dataset were subsequently assessed. The indicators were found to be acceptable and are presented in **Table 4**, along with additional measures of dispersion, reliability, and adequacy.

**Table 4.** Descriptive statistics of the data from 32 states.

| Code | Variable | Mean | Std dev | Min | Max |
|---|---|---|---|---|---|
| TR | Own-source tax revenue | 3.12E+09 | 4.80E+09 | 3.57E+08 | 2.66E+10 |
| FE | Fiscal effort | 0.3595 | 0.1307 | 0.1882 | 0.7564 |
| URB | Urbanisation rate | 0.7657 | 0.139283 | 0.4839 | 0.9942 |
| EMP | Registered businesses | 141,108 | 122,255 | 29,358 | 579,655 |
| PERS | Remunerated personnel | 444,555 | 476,458 | 89,465 | 2,496,598 |
| LFP | Labour force participation rate | 60.10 | 3.0102 | 53.78 | 67.0859 |
| VEHIC | Motor vehicles | 1,251,550 | 1,250,714 | 259,893 | 5,608,921 |
| ROOMS | Hotel rooms | 4,162,793 | 4,943,580 | 278,137 | 27,126,879 |

Source: Author's own elaboration. KMO Measure of Sampling Adequacy = 0.755; Bartlett's Test of Sphericity: Approx. Chi-square = 304.625, df = 28, sig. = 0.000.

Finally, simple correlation tests were conducted, and the results were used to determine the variables to be included in the linear regression model proposed to measure own-state tax revenue as a percentage of GSP.

## 4. Results

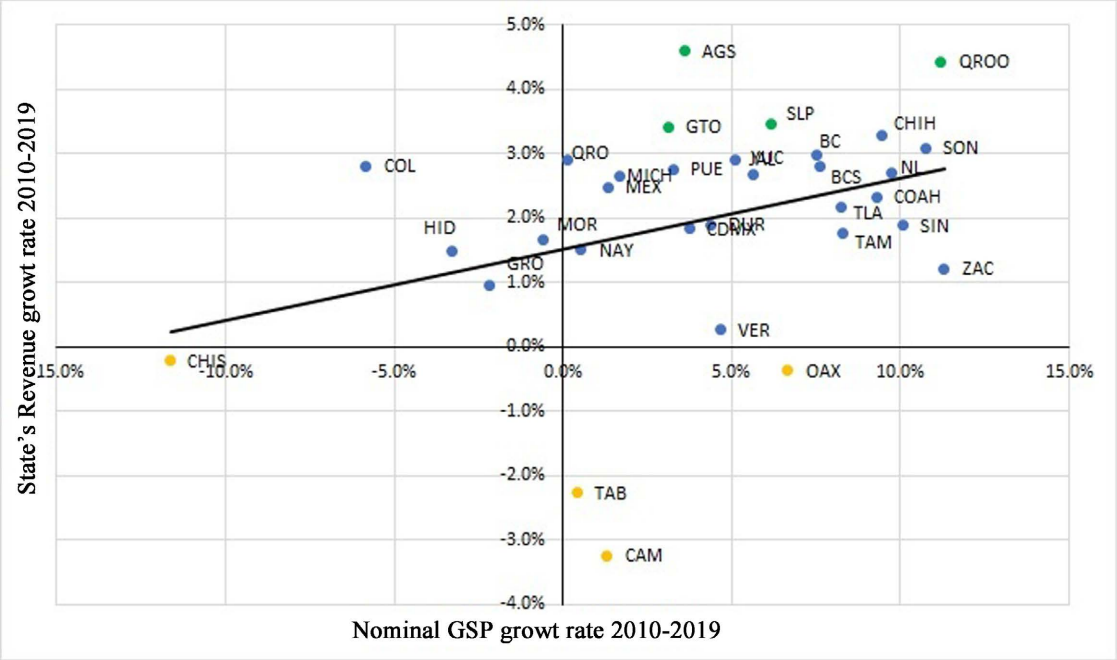
The first result presented relates to the fiscal effort indicator, which was calculated for the year 2019 and compared with that of 2007, as reported by Vázquez Soto & Moreno Ayala (2012). This indicator decreased in only six states, with Mexico City (CDMX) showing the largest decline over the period: 0.31 percentage points. In the remaining states, fiscal effort increased, as shown in Table 5. The average fiscal effort in 2007 was 0.32 percent, and it increased by 0.04 percentage points to reach 0.36 percent in 2019, indicating marginal growth over the twelve-year period. This suggests that nearly all states improved their own-source revenue collection, and at least twelve states exceeded the average fiscal effort as a percentage of GSP. Quintana Roo led the ranking with 0.76%, followed by Mexico City with 0.70%, the State of Mexico with 0.52%, Baja California Sur with 0.51%, and both Nayarit and Chihuahua with 0.50%. Notably, no state collected more than 1% of its GSP in 2019, unlike in 2007 when Mexico City surpassed that threshold. However, the lowest fiscal effort recorded in 2019 was 0.19%, a figure that at least five states failed to reach in 2007.

**Table 5.** Fiscal Effort by state, 2007 and 2019.

| Code | State | 2007[a] | 2019[b] | Code | State | 2007[a] | 2019[b] |
|---|---|---|---|---|---|---|---|
| AGS | Aguascalientes | 0.28 | 0.31 | MOR | Morelos | 0.19 | 0.23 |
| BC | Baja California | 0.41 | 0.39 | NAY | Nayarit | 0.47 | 0.50 |
| BCS | Baja California Sur | 0.56 | 0.51 | NL | Nuevo León | 0.28 | 0.46 |
| CAM | Campeche | 0.07 | 0.24 | OAX | Oaxaca | 0.15 | 0.23 |
| COAH | Coahuila de Zaragoza | 0.15 | 0.25 | PUE | Puebla | 0.27 | 0.33 |
| COL | Colima | 0.29 | 0.32 | QRO | Querétaro | 0.44 | 0.39 |
| CHIS | Chiapas | 0.33 | 0.34 | QROO | Quintana Roo | 0.43 | 0.76 |
| CHIH | Chihuahua | 0.49 | 0.50 | SIN | Sinaloa | 0.20 | 0.28 |
| CDMX | CD Mexico | 1.01 | 0.70 | SLP | San Luis Potosí | 0.18 | 0.32 |
| DUR | Durango | 0.29 | 0.29 | SON | Sonora | 0.29 | 0.35 |
| GRO | Guerrero | 0.33 | 0.27 | TAB | Tabasco | 0.07 | 0.28 |
| GTO | Guanajuato | 0.35 | 0.40 | TAM | Tamaulipas | 0.28 | 0.37 |
| HID | Hidalgo | 0.23 | 0.25 | TLA | Tlaxcala | 0.24 | 0.24 |
| JAL | Jalisco | 0.27 | 0.27 | VER | Veracruz | 0.26 | 0.32 |
| MEX | México | 0.52 | 0.47 | YUC | Yucatán | 0.24 | 0.44 |
| MICH | Michoacán | 0.24 | 0.19 | ZAC | Zacatecas | 0.29 | 0.30 |
| | Average | | | | | 0.32 | 0.36 |

[a]Data from Vázquez Soto & Moreno Ayala (2012). [b]Calculated by author.

The second result presented is the comparison of the growth in own-source revenues between 2010 and 2019, in relation to the change in GSP over the same period, in order to identify the states that have advanced and those that have lagged behind. Figure 1 illustrates the states with the highest growth in tax collection (green dots), namely Aguascalientes (AGS), Quintana Roo (QROO), San Luis Potosí (SLP), and Guanajuato (GTO), whereas the states that experienced a decline in tax revenue were Campeche (CAM), Tabasco (TAB), Oaxaca (OAX), and Chiapas (CHIS) (yellow dots). It can also be observed that the states with the highest dependence on oil production in their GSP were those that saw the largest decreases in tax collection over the period (CAM and TAB), while states with a strong automotive industry, such as AGS, GTO, SLP, and CHIH, recorded the highest increases, alongside QROO, driven by tourism.




Source: Author's own elaboration.

Figure 1. States' own-source tax revenues vs GSP (annual growth rates), 2010-2019.

The evolution of tax autonomy was also analysed, defined as the change in the number of taxes implemented by states between 2010 and 2019. Table 6 shows that 18 out of 32 states—just over half—introduced between one and five new taxes, with Guanajuato, Campeche, and Quintana Roo being the most notable cases. However, at least eight states reduced the number of local taxes for various reasons, while six states remained unchanged. Despite this, the total number of state taxes did not show a significant association with fiscal revenue, suggesting that the introduction of new taxes does not necessarily lead to an increase in fiscal income. It would be expected that the number of taxes to determine fiscal performance in each state, but this has not been the case and this coincides with Kaldor's (2021) argument discussed previously, regarding the poor performance of some

taxes and their limited contribution to state revenue; Sobarzo (2006) argues that this is due to regional economic disparities in Mexico and the varying administrative capacity of their tax collection agencies. A higher number of taxes does not seem to be related to a greater weight in the structure of state revenues, but rather to the type of tax and the breadth of its base (Vázquez Soto & Moreno Ayala, 2012; Aranda Blanco et al., 2023); in addition, some taxes are deductible for companies, such as payroll tax or vehicle property tax, which makes them more attractive to comply with and, therefore, generate more revenue.

**Table 6.** Number of own taxes by State, in 2010 and 2019.

| Code | State | 2010[a] | 2019[b] | Code | State | 2010[a] | 2019[b] |
|---|---|---|---|---|---|---|---|
| AGS | Aguascalientes | 7 | 8 | MOR | Morelos | 9 | 7 |
| BC | Baja California | 8 | 8 | NAY | Nayarit | 12 | 7 |
| BCS | Baja California Sur | 4 | 5 | NL | Nuevo León | 4 | 5 |
| CAM | Campeche | 7 | 7 | OAX | Oaxaca | 8 | 8 |
| COAH | Coahuila de Zaragoza | 7 | 8 | PUE | Puebla | 6 | 3 |
| COL | Colima | 7 | 7 | QRO | Querétaro | 8 | 6 |
| CHIS | Chiapas | 7 | 5 | QROO | Quintana Roo | 6 | 8 |
| CHIH | Chihuahua | 9 | 9 | SIN | Sinaloa | 7 | 7 |
| CDMX | CD Mexico | 7 | 6 | SLP | San Luis Potosí | 4 | 6 |
| DUR | Durango | 6 | 6 | SON | Sonora | 5 | 6 |
| GRO | Guerrero | 7 | 8 | TAB | Tabasco | 6 | 7 |
| GTO | Guanajuato | 9 | 7 | TAM | Tamaulipas | 5 | 6 |
| HID | Hidalgo | 7 | 7 | TLA | Tlaxcala | 8 | 8 |
| JAL | Jalisco | 8 | 6 | VER | Veracruz | 5 | 5 |
| MEX | México | 4 | 6 | YUC | Yucatán | 7 | 8 |
| MICH | Michoacán | 4 | 5 | ZAC | Zacatecas | 5 | 6 |
| | Average | | | | | 7 | 7 |

[a]Data from IMCO (2010), [b]Data from IMCO (2021).

Pearson's correlation test was applied to assess the association between the independent variables and the dependent variables: fiscal effort and own-source tax revenue. The results, shown in **Table 7**, reveal significant associations between certain explanatory variables and the outcome variables.

The results of the Pearson correlation test indicate that the variables urbanisation, remunerated personnel, and hotel rooms are associated with both the fiscal effort indicator and own-source tax revenue. In contrast, the number of registered businesses and motor vehicles in each state is only associated with own-source revenue, while the labour force participation rate is associated with fiscal effort.

Based on these findings, a multiple linear regression (MLR) was conducted, em-

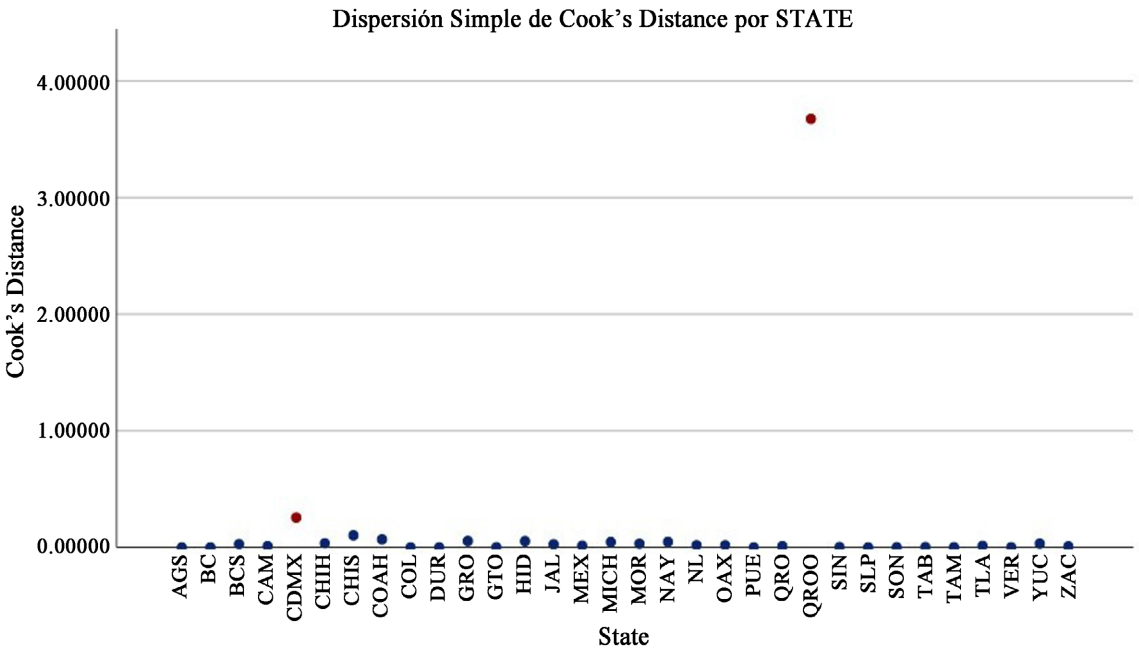
ploying the Best Linear Unbiased Estimators (BLUE), and the necessary assumptions were verified. The preliminary analysis identified 2 outliers: data from Mexico City (CDMX), whose revenue collection surpasses that of all other states and includes property tax as a state-level rather than municipal tax, due to a special legal condition aligning it with the rest of the 31 states, and Quintana Roo (QROO), which collects significant revenue from tourism, accounting for 22.8% of total national tourism income in 2021 (Sectur, 2024). Cook's distances were then calculated for the 32 states, as shown in **Figure 2**; the data for CDMX and QROO, with values of 3.67422 and.25608, exceed the threshold of 4/n = 0.125 (red dots).

To assess the effect of outliers on the analysis, a multiple linear regression model was first estimated in SPSS using data from all states, under the classical assumptions of the ordinary least squares (OLS) method. The six predictors

**Table 7.** Correlation matrix between predictor and outcome variables.

| N = 32 | Fiscal Effort | Own Tax Revenue |
|---|---|---|
| Urbanisation | 0.471* | 0.441* |
| Businesses | 0.167 | 0.662** |
| Remunerated Personnel | 0.481** | 0.982** |
| Labour Participation | 0.493* | 0.041 |
| Hotel Rooms | 0.800** | 0.391* |
| Motor Vehicles | 0.333 | 0.811** |

Note: *$p < 0.05$ (two-tailed); **$p < 0.01$ (two-tailed). Source: Author's own elaboration.




Source: authors' own calculation.

**Figure 2.** Simple dispersion of Cook's distances by state.

significantly associated with the dependent variables were considered. The stepwise method was applied to add or remove variables based on statistical criteria, thereby identifying the most explanatory subset. This approach helps build a model that better fits the data. The initial results are presented in Table 8.

Table 8. Linear regression model of states' Fiscal Effort in Mexico, 2010-2019.

| Model summary | | | | | | |
|---|---|---|---|---|---|---|
| | R | R squared | Adjusted R-squared | Standard error of the estimate | | Durbin-Watson |
| | 0.842 | 0.708 | 0.688 | 7.29819 | | 2.914 |
| ANOVA[a] | | | | | | |
| | | Sum of squares | Gl | Mean square | F | Sig. |
| | Regression | 3753.807 | 2 | 1876.903 | 35.238 | 0000[b] |
| | Residual | 1544.643 | 29 | 53.264 | | |
| | Total | 5298.449 | 31 | | | |

[a]Dependent variable: Fiscal Effort (FE). [b]Predictors: (Constant), Hotel Rooms (ROOMS), Urbanisation (URB).

| Coefficients[a] | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Unstandardised coefficients | | Standardised coefficients | | | Collinearity Statistics | |
| | B | Std. Error | Beta | t | Sig. | Tolerance | VIF |
| (Constant) | −0.202 | 8.403 | | 1.139 | 0.264 | | |
| ROOMS | 1.918E−6 | 0.000 | 0.725 | 6.959 | 0.000 | 0.925 | 1.081 |
| URB | 25.549 | 9.785 | 0.272 | 2.611 | 0.014 | 0.925 | 1.081 |

[a]Dependent variable: Fiscal Effort (FE).

To obtain more reliable estimates, some authors (Aguilar Gutiérrez, 2010; Favila Tello & Armas Arévalos, 2018) recommend excluding certain data in order to better assess model behaviour. Accordingly, the linear regression was repeated using the same stepwise method, this time excluding the outliers from the analysis (CDMX and QROO). A summary of the results is presented in Table 9.

The comparison between Table 8 and Table 9 highlights the impact of outliers on variable selection and model fit. Although the F-value decreased from 35.238 to 11.824 after removing the outliers, both models remain statistically significant ($F > 10$); this reduction suggests a decrease in explanatory power, but also reflects improved robustness. Notably, the Durbin-Watson statistic dropped from 2.914 to 2.074, indicating that the initial model suffered from negative autocorrelation, which was corrected by removing the extreme observations. The MLR model estimated explains the behaviour of fiscal effort (FE) based on three independent variables: the number of hotel nights registered in the state (ROOMS), the number of active enterprises (EMP), and the number of formally employed individuals

**Table 9.** Linear regression model of states' Fiscal Effort in Mexico, 2010-2019.

| Model summary | | | | | |
|---|---|---|---|---|---|
| R | R squared | Adjusted R-squared | Standard error of the estimate | | Durbin-Watson |
| 0.760 | 0.577 | 0.528 | 6.19277 | | 2.074 |

| ANOVA[a] | | | | | |
|---|---|---|---|---|---|
| | Sum of squares | Gl | Mean square | F | Sig. |
| Regression | 1360.419 | 2 | 453.473 | 11.824 | 0.000[b] |
| Residual | 997.112 | 26 | 38.350 | | |
| Total | 2357.531 | 29 | | | |

[a]Dependent variable: Fiscal Effort (FE). [b]Predictors: (Constant), Hotel Rooms (ROOMS), Businesses (EMP), Remunerated Personnel (PERS).

| Coefficients[a] | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Unstandardised coefficients | | Standardised coefficients | | | Collinearity Statistics | |
| | B | Std. Error | Beta | t | Sig. | Tolerance | VIF |
| (Constant) | 25.360 | 2.184 | | 11.610 | 0.000 | | |
| ROOMS | 3.635E−6 | 0.000 | 0.862 | 5.434 | 0.000 | 0.646 | 1.548 |
| EMP | −5.711E−5 | 0.000 | −0.720 | −3.638 | 0.001 | 0.415 | 2.410 |
| PERS | 1.160E−5 | 0.000 | 0.390 | 2.210 | 0.036 | 0d.523 | 1.911 |

[a]Dependent variable: Fiscal Effort (FE)

(PERS). The resulting model shown in Equation (2) presents a multiple correlation coefficient of 0.760, indicating a moderately strong relationship among the variables; furthermore, the coefficient of determination $R^2$ suggests that approximately 57.7% of the variation in fiscal effort can be explained by the three variables included in the model.

$$FE = 25.360 + (3.635\text{E}-6)\,ROOMS - (5.711\text{E}-5)\,EMP + (1.160\text{E}-5)\,PERS \quad (2)$$

The signs of the estimated coefficients allow for the following interpretations: a higher number of hotel nights (ROOMS) and a greater number of formally employed persons (PERS) are positively associated with fiscal effort, which may reflect stronger economic activity and greater formalisation. In contrast, the negative coefficient for the EMP variable implies that an increase in the number of enterprises is associated with a reduction in fiscal effort. This may indicate higher levels of tax evasion or a predominance of small firms with limited fiscal contributions or tax exemptions.

The first factor identified in the model is the number of hotel room nights. In the reference year (2019), Mexico received 24 million tourists who accounted for 133.2 million hotel room nights (SECTUR, 2025). Mexico ranks as the sixth most visited country in the world, and tourism represented 8.85% of the national GDP

over the previous two decades, from 2003 to 2022 (SECTUR, 2024). Tourism is a sector that significantly contributes to tax revenue, as most states impose a lodging tax on hotel stays, typically ranging from 2% to 5% of total billing. It has been associated to tax efficiency model as in Guillermo Peón & Vargas Casimiro (2017). **Figure 3** shows that states with higher tourism income tend to have a higher GSP, revealing a clear positive relationship.

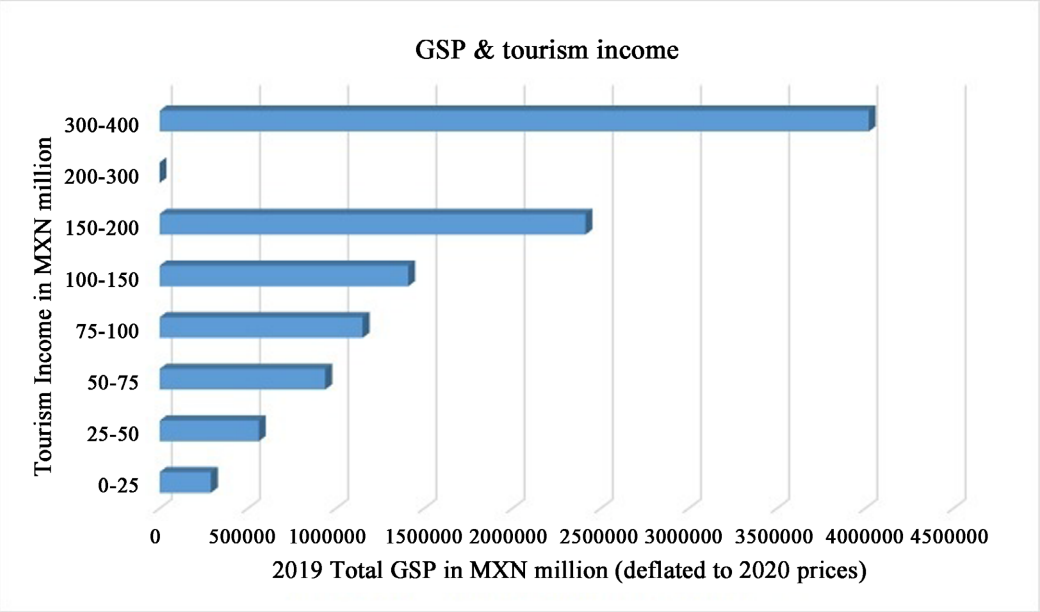



**Figure 3.** Relationship between GSP and tourism income in the Mexican States, 2019.

The number of businesses established in each state was the second factor significantly associated with fiscal effort in the proposed model. As Guillermo Peón & Vargas Casimiro (2017) pointed out, GSP is strongly associated with tax collection in the states of Mexico, so market size, measured by the number of registered businesses, has also been associated with state production. Peredo (2022: p. 30) suggests that the possible relationship between the number of businesses and state tax collection lies in the fact that the economic units in the tax records are the ones that pay payroll tax or lodging tax. The map in **Figure 4** shows that 20 of the 32 states collected less than 2 million Mexican pesos (MXN) for every 100 businesses located in their territories between 2010 and 2019; other 7 states with median revenue collect between MXN 3 and 4 million for every 100 companies and are mainly located in the north of the country. Only five states collect more than MXN 5 million, two of which (CHIH and NL) are located on the northern Mexican border with the United States, where the export industry, car assembly plants, and the manufacturing industry, which are major employers of workers, prevail. Two other states are in the southeast, one has an oil industry (CAM) and the other is the country's main tourist destination, where Cancun is located (QROO). Mexico City (CDMX) in the center of the country (in dark pink) is the largest collector of all, with almost 7 million pesos per 100 businesses.


Source: authors' own elaboration.

**Figure 4.** Average 2010 to 2019 tax revenue per 100 businesses, in MXN millions (2019).

According to related literature (Guillermo Peón & Vargas Casimiro, 2017; Aranda Blanco et al., 2023), a positive relationship was expected between remunerated personnel and fiscal effort, as also occurred with the previous variable. This is because companies pay a state payroll tax in all 32 Mexican states; therefore, there is a logical relationship between the total number of established businesses in a state and the number of salaried employees reported. It is worth noting that, in economic studies, a region's output is linked to employment, which in turn drives wage growth. For this reason, the payroll tax accounted for 64.5% of state revenues in Mexico in 2022, equivalent to 0.5% of the national GDP (OECD et al., 2024: pp. 93-95).

Other independent variables did not show statistical significance at the 5% level and were excluded from the proposed model, althought they were supported by previous literature; their lack of significance in this case may be attributed to contextual factors specific to the analyzed country or to potential multicollinearity effects of dataset. First of them is urbanity rate (URB); in this regard, it is worth noting that Mexico exhibits a higher proportion of rural population in comparison with certain Ibero-American countries (those where spanish or portuguese is spoken). In 2019, the average urbanisation rate across Mexico's 32 states stood at 77.7%, whereas in Argentina and Brazil it reached 92.4% and 89% respectively,

federal countries with higher state tax revenue (see Table 1); this factor was associated to fiscal effort as well as own-source tax revenue, but finally was excluded from the MLR model. Registered motor vehicles in each state were associated only with own-source revenue due to the vehicle ownership tax, but were excluded from the proposal model, similar to other studies (Guillermo Peón & Vargas Casimiro, 2017).

## 5. Discussion

Governments with a federal system are characterized by fiscal federalism, which implies a balance in the powers of the different levels of government in terms of revenue collection, which can make it more efficient. The results found here show that the current tax collection of Mexico's subnational governments remains low and does not contribute to increasing fiscal effort; nor does it grant them greater autonomy, and they remain dependent on federal transfers.

The international literature offers numerous studies that identify factors associated with tax revenue. At the global level, for example, Andrejovská & Puliková (2018) found that the rate of formal employment is positively correlated with revenue collection in 28 European countries. In Indonesia, meanwhile, market size—as measured by GDP—was shown to have a significant association with tax revenue, according to Wijaya & Dewi (2022: p. 731). In the Mexican context, Aguilar Gutiérrez (2010) identified a positive relationship between tax revenue and variables such as state's GDP, population, industrial diversification, and urbanisation. Likewise, the level of education is positively associated with tax revenue, as individuals with higher levels of schooling tend to have higher incomes, greater tax awareness, and are more likely to be captive taxpayers. Conversely, lower educational attainment is associated with higher levels of informal employment and tax evasion (Wijaya & Dewi, 2022: p. 730).

Beyond the determinants of tax revenue, some studies have identified factors that directly influence fiscal effort. In particular, Johnson & Roswick (2000, cited in Martínez Sánchez & Cano Moreno, 2022) highlight variables related to economic and demographic activity, such as employment, trade, banking activity, and tourism. In this study, the key determinants of state-level fiscal effort in Mexico were identified as socio-economic factors: tourism (measured by the number of hotel rooms rented per night in 2019), the average businesses between 2010 and 2019 in every state and the remunerated personnel during the same period.

When classifying the fiscal effort of the states on a five-level scale, it was observed that only one state recorded a very low level (below 0.20); 23 states—the majority—fell into the low category (between 0.21 and 0.40); five states reached a medium level (between 0.41 and 0.60); and only two registered a high level (between 0.61 and 0.80). No state achieved a very high level (above 0.81).

According to the OECD's Revenue Statistics report (2024), subnational tax revenue in federal countries during 2022 was as follows: Australia (4.6% of GDP), Austria (0.8%), Belgium (4.3%), Canada (13.2%), Germany (9.8%), Mexico (0.7%),

Switzerland (6.9%), and the United States (5.8%). In Ibero America, direct comparison with Mexico is limited, as most countries have adopted a centralised regime in which the national government collects the majority of revenue and subsequently transfers resources to subnational authorities. Nevertheless, in Colombia—despite not having a federal system—regional governments collect 0.7% of GSP through consumption taxes and a further 0.3% through other levies.

In Mexico, state-level tax revenue is concentrated primarily in the payroll tax (0.5% of GDP), while property taxes and taxes on the consumption of goods and services each contribute only 0.1% of GDP. In contrast, several OECD member countries have granted greater fiscal authority to their subnational governments. In particular, taxes on wages, income, and capital constitute the main source of state-level revenue as a share of subnational GDP in Germany (5.0%), Austria (0.3%), Belgium (2.0%), Canada (6.7%), Switzerland (5.2%), and Spain (3.9%). Likewise, taxes on the consumption of goods and services play a significant role in Germany (4.1%), the United States (2.9%), and Canada (4.5%). Property taxes are the principal revenue source in Australia (1.9%) and the second most important in Spain (1.9%), Switzerland (1.2%), and Belgium (1.6%). The payroll tax also holds a relevant position in Australia (1.3%), Austria (0.3%), and Canada (0.7%).

With regard to the number of taxes, there is evidence that low state revenue in countries in the region is related to a lower number of taxes that governments can collect; thus, regional governments in Mexico display a low level in comparison with other Ibero-American countries (Aguilar Gutiérrez, 2010). Since the analysis by Vázquez Soto & Moreno Ayala (2012), based on 2007 data, limited progress has been observed in the fiscal effort of Mexico's states. While in countries such as Argentina and Brazil, state governments collected 17.1% and 23.4% of national tax revenues, respectively, in Mexico, this figure was merely 4.5%. This is largely attributed to legal restrictions that prevent states from taxing activities or goods already subject to federal taxes (OECD et al., 2024). This structural feature may hinder the capacity to increase local revenue. Indeed, own-source revenue has remained virtually stagnant: according to IMCO (2024), it increased by only 0.1% as a share of total revenue over the past eight years.

Kaldor (2021) argues that developing countries fail to raise higher revenues because they do not fully exploit their tax potential. Similarly, Chang et al. (2020), based on a study of best practices in over 150 tax administrations worldwide, conclude that operational strengthening, digitalisation of services, and greater autonomy contribute significantly to improved revenue collection (p. 6). Therefore, middle-income countries such as Mexico should pursue substantive reforms to their tax systems in order to strengthen subnational fiscal revenues, by eliminating exemptions that favour particular groups — although such changes often face opposition from powerful entrenched interests (Ahmad et al., 2016; Piancastelli & Thirlwall, 2020).

Shi & Tao (2018) found that local governments with more diversified revenue

structures face greater fiscal pressure. Accordingly, they propose the use of non-tax revenues—such as fees and special contributions—as mechanisms to alleviate such pressure. Similarly, Martínez Sánchez & Cano Moreno (2022) argue that the passivity or inaction of local governments is linked to their dependence on financial transfers, which constrains their revenue-raising capacity. In response, they propose strengthening institutional capacities in order to achieve greater fiscal autonomy. An interesting alternative is presented by Belmonte Martín (2013: p. 44), who documents successful experiences in Spain involving the participation of autonomous provincial agencies and partner companies in tax administration. The professionalisation of collection processes and the elimination of recurrent tax amnesty programmes are also cited as necessary strategies.

The capacity of Mexican state governments to increase their revenue is limited due to the current configuration of the national tax system, which centralises most fiscal authority at the federal level (Sobarzo, 2006; Chávez Chávez, 2016; García Pureco & Herrera Aguilar, 2023). In this context, Banda-Ortiz & Tovar-García (2018) contend that Mexico's tax structure represents an obstacle to long-term economic growth. The findings of this study support this hypothesis: since the implementation of the National Fiscal Coordination System (Sistema Nacional de Coordinación Fiscal, SNCF), the share of own-source revenue in total state income has declined. Whereas between 1981 and 2000 it averaged 6.6%, it fell to 4.9% between 2010 and 2019 (Sobarzo, 2006: p. 816; IMCO, 2021: p. 15), and by 2022 it had dropped to just 4.5% (OECD, 2024). Moreover, there is a marked asymmetry between states, with own-source revenue ranging from 10% to 30% of state budgets.

The main results are consistent with previous literature, in that they reflect that greater economic activity and formalization of employment generate greater revenue collection capacities for local governments. As the results show, state agencies should increase their collection activity, as Chávez Chávez (2016) states that there is international evidence that federal and state governments can coordinate with each other to improve their own revenues, while at the same time taking care of public spending. It could be exploring green taxation, i.e. extractive or polluting industries; in Ibero America, environmental taxes are underdeveloped and have not yet had the expected revenue-raising effects, as in recent years their performance has varied between +0.5% and −1.8% (OECD et al., 2024: p. 44).

Any future reform of Mexico's tax structure should be accompanied by a professionalisation process for public servants. In this regard, Bolaños & Franco (2021) highlight training as one of the most effective actions that the three levels of government can undertake to improve revenue collection. Ultimately, greater state-level tax collection could translate into more progressive public spending, particularly in rural areas where the majority of the low-income population resides (SHCP, 2022).

This study acknowledges as its main limitation the inability to develop a more complex econometric analysis, which lies beyond the scope and intention of the work. Nevertheless, they provide a useful foundation for future research aimed at

deepening the causal analysis of fiscal effort among subnational governments.

## 6. Conclusion

From a financial and fiscal standpoint, achieving a sustainable balance between public expenditure and revenue collection is essential for any country, regardless of whether its governmental structure is federal, centralised, or subnational. In particular, state governments in Mexico exhibit low levels of own-revenue collection and rely heavily on federal transfers to finance their public spending. However, given their limited legal capacity to introduce new taxes, it is crucial that these governments strengthen their own revenue collection efforts. Various authors agree that, in order to do so effectively, improvements are needed in areas such as the expansion and monitoring of the tax base.

The fiscal effort made by Mexican states has not improved over the past forty years; on the contrary, it has followed a downward trend. In contrast, subnational governments in federal OECD member countries demonstrate better performance in this indicator, as they possess broader authority to tax income, profits, capital, consumption of goods and services, and other activities. Even some countries in the Ibero-American region outperform Mexico in this regard.

A promising strategy to enhance own-revenue collection at the state level involves identifying economic activities that fall outside the federal tax domain. Since 2024, some states have begun implementing environmental taxes aimed at mitigating automotive and industrial pollution. Others have focused on taxing tourism-related sectors, such as casinos and gambling activities, while a number of states have started levying taxes on digital platforms widely used for private transport and entertainment services, to name but a few examples. It is particularly relevant to monitor the outcomes of these recent fiscal reforms in order to assess whether the new taxes succeed in increasing state governments' own revenue collection.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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