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ORIGINAL ARTICLE

Descriptive Analysis of Tax Revenues in the Province of Manabí, Ecuador

Análisis descriptivo de la recaudación tributaria en la provincia de Manabí, Ecuador

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Abstract

Tax revenues in Latin American countries, including Ecuador, have become the main source of income for the state, with consumption and income taxes accounting for the largest percentages. At the territorial level, a few provinces generate the largest share. In this context, the province of Manabí ranks fourth in its contribution to the national total, and within it, three cantons exhibit the most dynamic tax collection activity. The objective of this study is to conduct a descriptive-evolutionary and causal analysis of tax revenues in the province of Manabí from 2010 to 2024. A quantitative correlational research approach was used, applying statistical methods and a multiple linear regression econometric model to analyze the causal relationship with economic variables. Data from the Internal Revenue Service (SRI) were collected annually for the national, provincial, and cantonal levels. Among the key findings, it is noteworthy that Ecuador has a centralized tax administration managed by the SRI (Internal Revenue Service), demonstrating an institutional concentration in tax revenue generation. The econometric model identified that Gross Value Added, tax pressure, and remittances, at a 95% confidence level, are statistically significant and explain 94.5% of tax collection patterns in the province, meeting all the assumptions that demonstrate its high statistical robustness. In conclusion, tax collection in the province of Manabí is influenced by factors related to national production and tax administration.

Keywords: *provinces, value-added tax, income tax, tax collections, fiscal policy*
Thematic: R1; H24; E62

Resumen

Las recaudaciones tributarias en los países de América Latina, incluido Ecuador, se han convertido en la principal fuente de ingresos para el Estado, dentro de lo que los impuestos al consumo y a la renta figuran como los de mayor porcentaje de participación. A nivel territorial existe pocas provincias que genera el mayor monto de participación. En este contexto la provincia de Manabí es la cuarta en el aporte al total nacional y dentro de esta son tres cantones los que tienen una mayor dinámica recaudatoria. El objetivo de este trabajo es realizar un análisis descriptivo-evolutivo y causal de las recaudaciones tributarias en la provincia de Manabí para 2010-2024. Se utilizó un enfoque de investigación cuantitativo correlacional aplicando el

método estadístico y un modelo econométrico de regresión lineal múltiple para analizar la relación causal con variables económicas. Se tomó datos del Sistema de Renta Internas (SRI) de frecuencia anual para el total nacional, provincial y cantonal. Entre los resultados relevantes destaca que Ecuador tienen una centralizada administración tributaria gestionada por el SRI, lo que evidencia una concentración institucional en la generación de ingresos por tributos. El modelo econométrico identificó que el Valor Agregado Bruto, la presión fiscal y remesas, al 95%, son estadísticamente significativas y explican en un 94,5% el comportamiento de las recaudaciones en la provincia, cumpliendo con todos los supuestos que demuestran su alta solidez estadística. En conclusión, las recaudaciones en la provincia de Manabí están condicionadas por factores relacionados a la producción y gestión tributaria nacional.

Palabras clave: *provincias, impuesto al valor agregado, impuesto a la renta, recaudaciones tributarias, política fiscal*
Clasificación JEL: D31; E62; H23

1. Introduction

Taxes are one of the ways in which national and subnational governments finance their functions and activities (Jácome, 2020). Their importance lies in the fact that they enable the authorities to meet the needs for goods, services, and other requirements that citizens demand from the State in their daily lives, thereby achieving social welfare (Neira-Galván, 2019).

In Ecuador, the management implemented by the SRI has been very successful according to many criteria, as it has made it possible to eliminate many shortcomings and increase tax collection through the control measures that have been exercised. Garzón et al. (2018) indicated that, in relation to tax regulation, among other actions, they located shell companies, provided training on tax obligations to individuals, companies, and special taxpayers, and applied better ways to validate taxpayer data through online services, among other aspects that have led to an increase in tax collection amounts.

Currently, the Ecuadorian tax system consists of income tax, value-added tax (VAT), excise tax (ET), import taxes, foreign currency exit tax (FCT), and other contributions that are recorded under the heading of other taxes. Over time, all governments have carried out tax reforms in order to create new taxes and/or modify existing ones.

Cases such as those that occurred after the 2016 earthquake, when VAT was increased from 12% to 14% through the approval of the Organic Law on Solidarity and Citizen Co-responsibility for the Reconstruction and Reactivation of the affected areas, whose objective was to immediately raise new economic resources to meet the needs arising from the natural disaster (Apunte-Zambrano et al., 2018). Another important change is the increase in the same tax as of April 1, 2024, a measure that came into force after the tax reform promoted by President Daniel Noboa, which sought to raise funds to address the internal armed conflict and contribute to fiscal sustainability (Chauca-Novoa et al., 2025).

In Latin America, national tax collection is carried out by a specific public institution and, in some cases, local governments are also involved, whether they be provinces, districts, departments, federal entities, etc. Although in many countries tax collection is analyzed from a national perspective, there is a subnational level that allows for visualization of collection behavior and its contribution to the country's overall tax system. An important aspect to highlight is that in countries, tax systems are made up of national taxes administered by the corresponding government institution and taxes collected at the subnational or territorial level administered by local governments (Vidarte, 2021).

This is the case in Peru, where Saavedra and Delgado (2020) pointed out that tax collection, as a means of managing its administration in the different levels of government, has been based on a controversial relationship between those who lead the levels of government and the inhabitants who pay the taxes. This is often due to the experience of failure to make good use of the resources they receive, which occurs for two reasons: first, taxation is carried out through abusive and excessive measures; second, there are a large number of taxpayers who evade taxes using illegal actions or also due to the inefficiencies of the systems implemented in government entities.

Manrique-Cáceres and Narváez-Soto (2020), in their study on tax collection at the departmental level in Peru for 2008-2017, showed that there is a large disparity and greater weight of tax capacities and revenues between the country's departments, since Lima, generated approximately 85% of the total tax revenue collected in the country during the years analyzed, followed in smaller proportions by Arequipa (3.5%), Piura (1.7%), and the remaining 21 departments, which collected only 7.7%.

For Mexico, Coutiño (2024) indicated, based on IMCO (2019), that 94% of tax revenues in this country are generated by the 32 federal entities, while the states collect only 5% and the municipalities barely 2%. Another relevant finding of this study was that by 2020, Mexico City contributed 47.1%, Nuevo León 8%, Tamaulipas 7.2%, Veracruz (6.8%) and Mexico (4.2%) were the five states that contributed the most in federal taxes; together representing 73.3%.

The Mayor's Office of Bogotá (2017) showed that in Colombia for the year 2023, excluding large taxpayers who mostly pay taxes in their place of administration, Bogotá generated the highest amount of revenue, contributing 14.7% of the total. In second place is Medellín, which contributed 4.9%, and in third place is Buenaventura with 4.8%. Cali and Barranquilla ranked fourth and fifth with 1.9% and 1.2%, respectively. Together, these five cities accounted for 27.5% of total tax revenue. After these cities, in order of importance with a smaller contribution, come Bucaramanga (0.97%), Santa Marta (0.65%), Cartagena (0.57%), Pereira (0.54%), and Cúcuta (0.39%); in general, these 10 cities contribute 30.7%.

In Bolivia, the main taxes are administered by the National Tax Service and the National Customs Service. In terms of revenue by region or department, for 2021, Santa Cruz, La Paz, and Cochabamba contributed 90.6% of total domestic market tax revenue, while 9.4% was collected by Potosí, Chuquisaca, Tarija, Oruro, Beni, and Pando (Ministry of Economy and Public Finance, 2022).

In Argentina, the tax system is administered by the Internal Revenue Service. Data from the Undersecretariat for Provincial Fiscal Coordination (2025) indicate that in 2024, the province that contributed most to national tax revenue was Buenos Aires, with 22.7% of the total. In second place was Santa Fe with 8.9%, and in third place was the province of Córdoba with 8.7%. Provinces such as Chaco (4.9%), Entre Ríos (4.8%), Tucumán (4.6%), and Mendoza (4.0%) had lower percentages. Together, these provinces contribute 62.6% of tax revenues in this country. The relative share of the other provinces is below 4

An additional aspect is that tax systems in countries are managed in very different ways, with fiscal federalism, which is understood as the way in which tax collection is distributed from an institutional point of view or at different levels of government (Madrigal-Delgado, 2021). This is not applicable to Ecuador, as there is a single institution (SRI) responsible for tax management, in which subnational governments do not participate.

Another aspect to consider is the allocation or derivation of bases. In the first case, according to the Tax Code in Ecuador regarding taxing power, Article 3 states that "only by legislative act of a competent body may taxes be established, modified, or extinguished," and only the President of the Republic (Article 7) is responsible for issuing regulations for the enforcement of tax laws; while the "Director General of the SRI and the General Manager of the Ecuadorian Customs Corporation, in their respective areas, shall issue circulars or general provisions necessary for the enforcement of tax laws and for the harmony and efficiency of their administration" (Ecuador, 2023).

In the derivation of bases, Ecuadorian regulations establish the existence of a model of territorial equity defined in the Organic Code of Territorial Organization, Autonomy, and Decentralization (COOTAD), which explicitly states that "decentralized autonomous governments shall receive 21% of permanent revenues and 10% of non-permanent revenues from the General State Budget" (Ecuador, 2023).

Regarding the incidence of taxation, Benzarti (2025) considered that the legal incidence is important, given that often traditionally accepted concepts, such as those held by Musgrave and Musgrave (1989), are no longer sufficient to explain how taxes work in real markets. In Ecuador, these reforms have been the focus of recent governments, whose objective is to increase tax collection, increasing the

fiscal effort to a pressure of 20.6% in 2023, which is lower than the average of 21.3% achieved by LAC countries (OECD, 2025).

Regarding the regressivity and/or progressivity of VAT, Rojas (2017) pointed out that in Ecuador, as this is a tax on the consumption of goods and services, it is indirect and regressive, which means that those who pay the most tax are those with the lowest income in the country's economy. Mieles (2024) conducted a micro-simulation to assess the impact of increasing VAT from 12% to 15% and found that, while it is true that this would generate an increase in tax revenue of approximately 15%, it would also lead to an increase in inequality and the regressivity of the tax system.

Thus, the problem addressed in this research allows us to propose a twofold research objective. First, to analyze the behavior of tax collection at the national level and particularly in the province of Manabí. Second, to examine the determinants of tax collection in Manabí based on a causal relationship between tax collection and sociodemographic and productive variables.

To achieve these goals, the research sought to answer the following questions: How has tax collection evolved in the province of Manabí in the period 2001-2024? And what are the sociodemographic and productive variables that affect the behavior of tax collection in the province of Manabí?

2. Materials and methods

This study used a quantitative methodology that allows for the collection, manipulation, and processing of statistical data (Hernández et al., 2014). Time series of tax revenue variables within Ecuador's public finance framework were processed. A non-experimental and descriptive design was applied, using statistical techniques that, according to Rendón-Macías et al. (2016), are used for data analysis and to evaluate comparisons at the national and provincial levels using statistical figures and measures such as percentage variation, share, cumulative annual rate, revenue/GDP ratio, maximum and minimum values.

The information used is from the SRI database hosted at https://www.sri.gob.ec/historico-estadisticas-generales-de-recaudacion, which provides statistics for the period 2000-2024 in absolute annual values, broken down by type of tax, provinces, cantons, and branches of activity (SRI, 2025).

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Complementarily, and in order to evaluate determining factors in tax collection in the province of Manabí, correlational research was applied using a multiple linear regression model based on Andrade and Correa-Quezada (2023), Llumiluisa-Morocho et al. (2022), and Manjón (2019). The independent variables were Gross Value Added (GVA), Tax Pressure (obtained from the ratio of Tax Revenue/GVA), and remittances. The original data for each variable were deflated using the Consumer Price Index (CPI) to obtain constant values (ECLAC; INEC, 2017). Due to the unavailability of the provincial index, CPI data for the city of Manta (the main contributor to provincial tax revenue) were used.

The econometric process involved evaluating the stationarity of the series to ensure that the estimators were robust; for this purpose, the Augmented Dicky-Fuller (Navas and Linthon, 2024) and Phillips-Perron (Pérez and Miranda, 2022) unit root tests were used. After verifying non-stationarity, the transformation into growth rates was performed in order to correct the variance and trend so as not to fall into spurious regression, which is a better procedure than simple difference (Wooldridge, 2009); with this process, the variables became stationary.

Once stationarity and consistency of the series were achieved, the multiple linear regression model was estimated in order to find the impact of two economic determinants and one external factor on tax collection in the province of Manabí, according to the relationship between variables in equation (1), which allowed the model to be specified in equation (2):

$$\text{Revenues} = \text{GVA} + \text{tax burden} + \text{remittances} \quad (1)$$

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \varepsilon_t \quad (2)$$

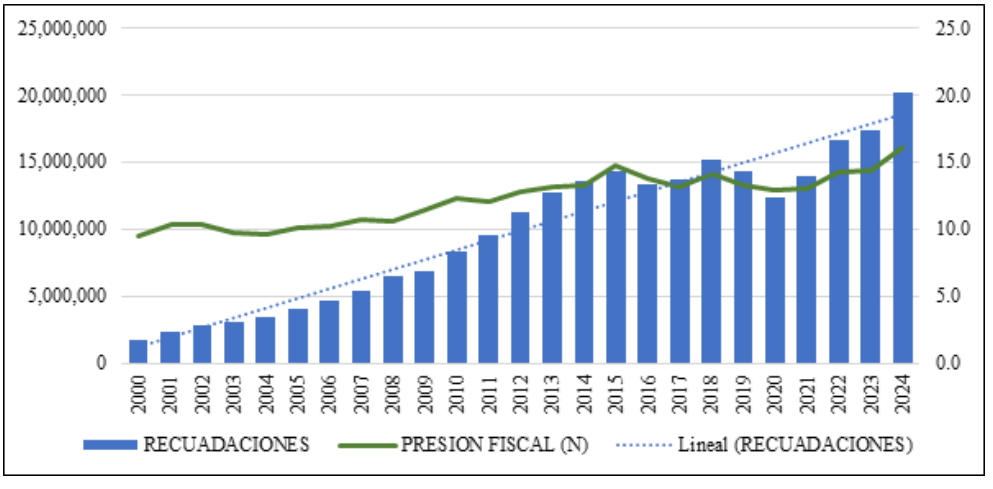
This was subjected to the respective diagnosis and, following the work of Lumabao et al. (2023), the robustness of the model was validated with tests of the main assumptions of correct specification using the Ramsey Reset and Tukey Link tests; normality of the residuals with the Jarque-Bera and Shapiro Wilk tests; heteroscedasticity, for which the White and Breusch-Pagan tests were applied; multicollinearity; serial correlation with the Breusch-Godfrey and Durbin-Watson tests; and white noise with the Box-Pierce Q test.

3. Results

As shown in Figure 1, after generating a minimum value of USD 1,673.5 million in 2000, between 2001 and 2006, revenues increased from USD 2,386.7 million to USD 4,672.3 million, representing an absolute increase of USD 2,285.6 million, which in percentage terms reached 95.8%. The increase in revenue was due to positive changes in tax collection, particularly in the areas of VAT; however, the problem of tax evasion also remained high (Martín-Mayoral, 2009).

In a second phase covering the period 2007-2016, the data indicate that the country experienced a sustained increase in tax payments, ranging from USD 5,361.8 million in 2007 to USD 14,341.2 million in 2015, with a sharp drop of -15.7% in 2016, which prevented the treasury from receiving 2,249.6 million. This evolution occurred around an annual average of more than 10 billion dollars. During this period, the ratio of tax revenue to GDP averaged 12.4

Figure 1. Evolution of tax revenue in Ecuador



Note: Prepared based on data from the Internal Revenue Service (SRI, 2025).

Tax revenue in Ecuador since 2017 has been unstable over time, unlike in previous years. Between 2017 and 2018, there was a significant recovery, reaching USD 15,096.8 million, driven by increases in indirect taxes such as VAT and ICE due to the year-on-year increase in imports; as well as the increase in income tax amounts, which is justified by the increase in revenue from personal tax returns and inheritances and legacies (Ministry of Economy and Finance, 2025).

Subsequently, in 2019, tax revenues fell by 5.5% compared to 2018, and in 2020, the reduction was even more significant, reaching 13.2%. In the first case, factors such as tax remissions and arbitration awards contributed to this reduction (Dávila-Toro, 2021). In contrast, in 2020, the most decisive factor in the decline in tax revenues was the COVID-19 pandemic, which, combined with the existing

economic crisis, led to a reduction in tax collection in Ecuador due to the suspension of payment deadlines (Páez-Abad et al., 2021).

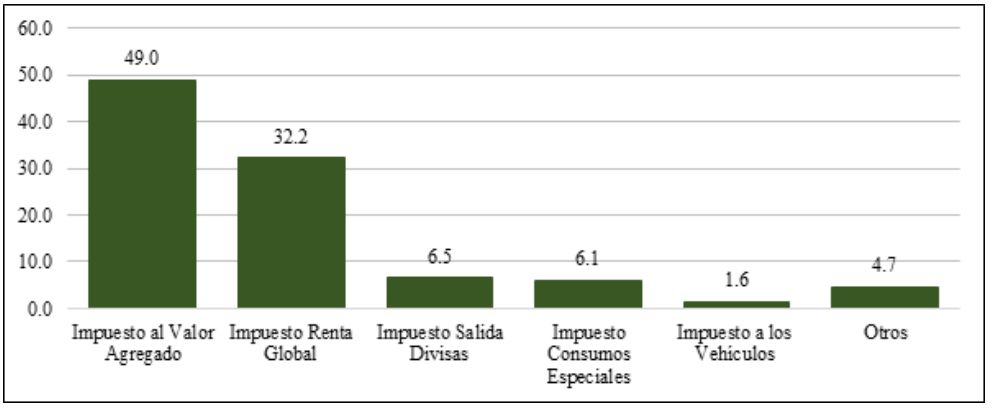
From 2021 to 2024, as shown in Figure 1, tax revenues have recovered significantly, rising from USD 13,976.2 million in 2021 to a total of USD 20,131.4 million in 2024. According to Marisol Andrade, former director of the SRI, the economic recovery and, to a large extent, the collection actions and control processes carried out by the SRI in the country contributed to the increase in 2021 (Coba, 2022).

Main taxes in total tax revenue

Tax revenue can be analyzed by breaking it down by type of tax. In Ecuador, of the total list of taxes that have been regulated, there are six that contribute most to the national treasury, whose order of importance is reflected in Figure 2.

As can be seen in Figure 2, Value Added Tax (VAT) is the tax with the largest share of tax revenue in Ecuador, representing 49.0% of total tax revenue for the cumulative period 2000-2024, followed by Income Tax with 32.2%. This dependency has important distributional implications. With regard to VAT, Verdesoto-Caiza and Tigre-Méndez (2025) indicated that this type of tax has a greater impact on lower-income households, as they have limited savings capacity because they allocate most of their resources to consumption. VAT represents a higher proportion of their income, as it is a regressive tax, thus contributing to widening the inequality gap.

Figure 2. Main taxes in total tax revenue



Note: Contains percentage share in the 2000-2024 cumulative total. Prepared using data from the Internal Revenue Service (SRI, 2025).

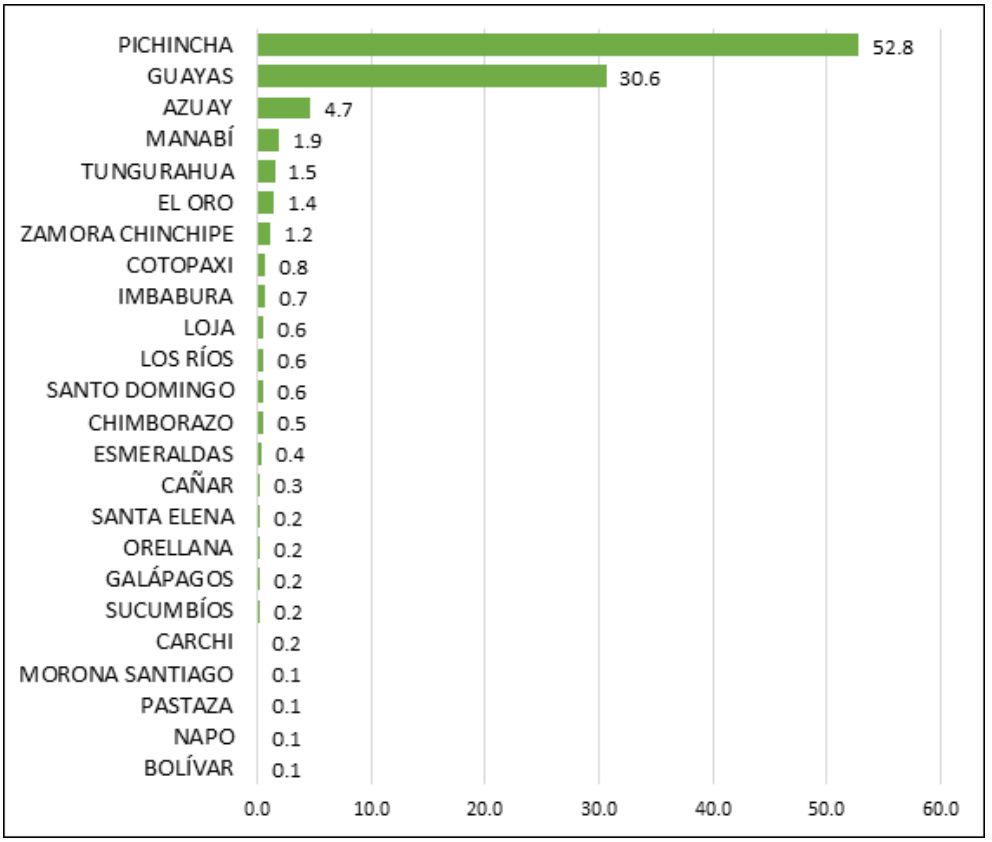
Tax revenue by main provinces

Ecuador's productive structure has historically been concentrated in five provinces. According to data from the Central Bank of Ecuador for 2023, Guayas (31.5%), Pichincha (26.6%), Manabí (5.2%), Orellana (5.1%), and Azuay (4.4%) generated 72.8% of total national production. This aspect correlates with the tax revenue collected by the State through the SRI in the country's 24 provinces.

The statistical information from the SRI (2025), shown in Figure 2, shows that in the cumulative period 2001-2024, only Pichincha (52.8%), Guayas (30.6%), and Azuay (4.7%) generated 88.1% of the total received by the State in taxes. Similarly, it can be seen that during this period, Manabí contributed 1.9% of the country's total, making it the fourth province that has generated the most tax revenue over time. For their part, Tungurahua (1.5%), El Oro (1.4%), and Zamora Chinchipe (1.2%) contributed a combined 4.1% of total revenue. The remaining 17 provinces had a marginal share, as they did not exceed 1% individually.

Evolution of tax revenues in the province of Manabí

Figure 3. Provincial share of tax revenues. 2001-2024 (%)



Note. Source: Internal Revenue Service (SRI, 2025). Evolution of tax revenues in the province of Manabí

Looking more specifically at the context described above, as shown in Figure 4 (red line), the province of Manabí's share in the same period has fluctuated between a minimum of 1.1% in 2006-2007 and a maximum of 2.8% in 2003.

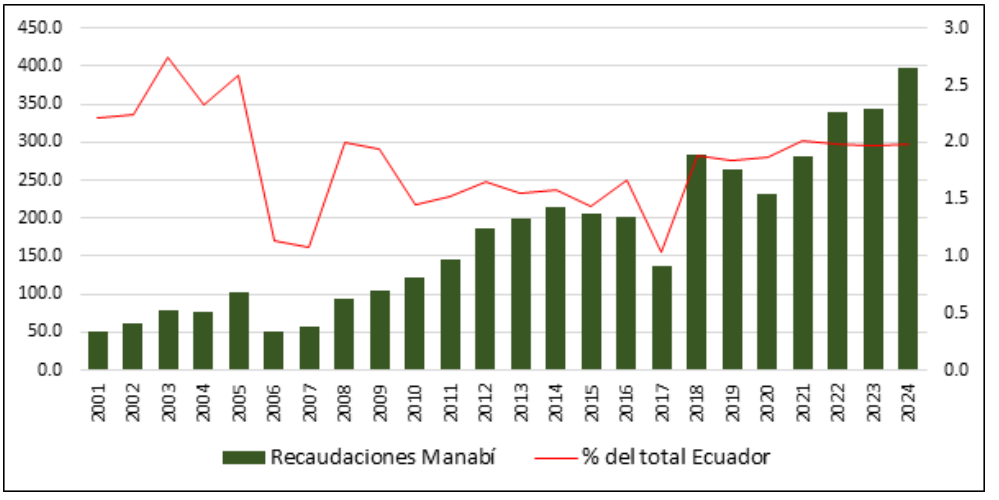
In monetary terms, Manabí collected $51.8 million in taxes in 2001, representing 0.2% of the national GDP. Over time, it can be seen that there have been years when this revenue has fallen, such as in 2006, when there was a reduction of -49.8% compared to the previous year. The same occurred in 2017, 2019, and 2020, when there were declines of -32.3%, -7.5%, and -11.7%, respectively. After the COVID-19 pandemic, the revenue generated in Manabí resumed its upward trend, with values much higher than before 2018, rising from $281.4 million in 2021 to $343.2 million in 2023, representing a growth rate of 47.8% compared to 2020. In 2024, the amount collected in this province reached a record $398.5 million, showing a growth rate of 16.1%.

Tax revenue by type in Manabí

Another approach that allows us to evaluate tax revenue performance at the provincial level is to break it down by type of tax. Below, we analyze the contribution that these have generated for the period 2010-2024.

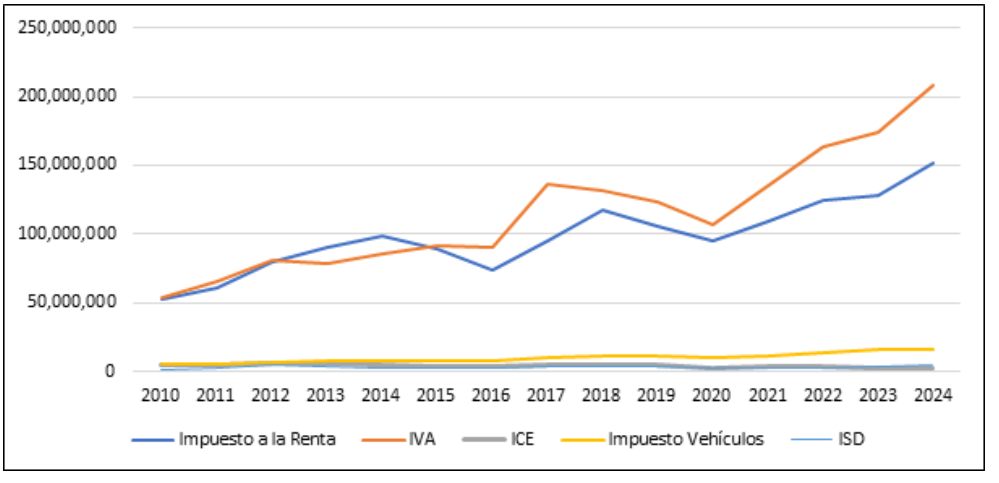
Figure 5 shows that the province of Manabí generates revenue for the country through tax collection, with its contribution to income tax and value added tax (VAT) being particularly noteworthy, as these represent the largest percentages of total tax revenue. Income tax collection grew steadily between

Figure 4. Tax revenue performance in the province of Manabí



Note: Figure showing revenue trends in millions of dollars (left axis) and the relationship to GDP. Source: Internal Revenue System (SRI, 2025).

Figure 5. Evolution of the main taxes collected in Manabí



Note. Source: Internal Revenue System (SRI, 2025).

2010 and 2014, with variation percentages ranging from 9.1% to 32.2%, with 2012 being the year with the highest growth.

Figure 5 shows that income tax collection in Manabí showed an interesting recovery for tax revenues from 2021 to 2024, years marked by positive variations, with a slight slowdown in 2023 and a significant increase in 2024, with a total of $151.3 million, the highest value recorded for this tax in the province of Manabí.

Value Added Tax (VAT) in Manabí, as in other provinces, generates significant revenue for the State. Between 2010 and 2024, there was a cyclical pattern with periods of expansion and contraction. Moreira-Cedeño and Palacios-Cedeño (2024) pointed out that the positive variation in this tax in the province is notable from 2021 onwards, following two natural events that had negative impacts: the 2016 earthquake and the 2020 pandemic.

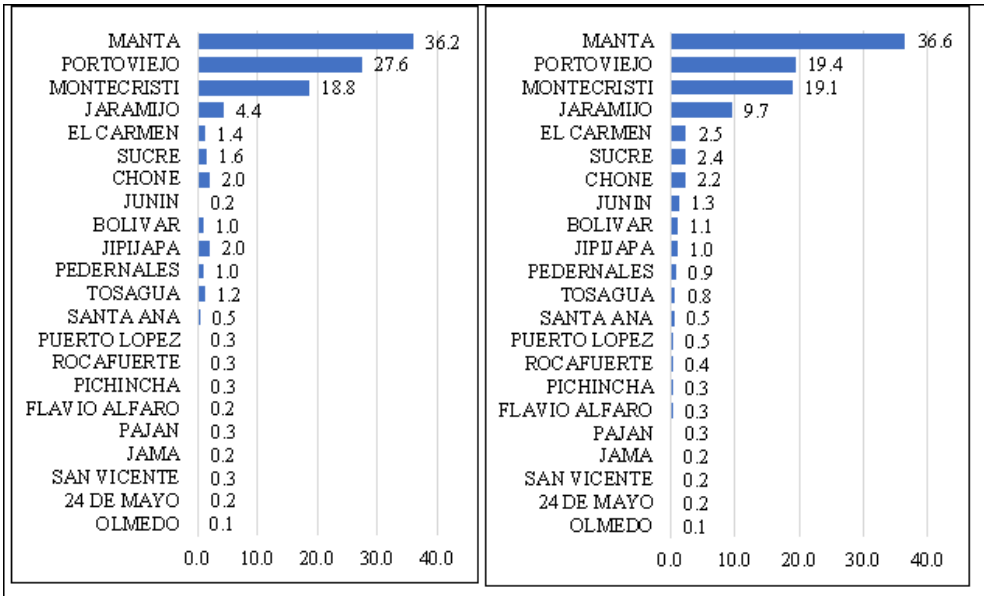
Arregui et al. (2025) suggested that the tax reforms carried out at the national level had a direct impact on VAT and income tax collection in the province of Manabí between 2018 and 2022. Reforms such as the Organic Law on Productive Development (2018), the Tax Simplification Law (2019), and the Economic Development Law (2021) transformed tax rates and control mechanisms, which had an impact on the province's revenue-raising capacity.

Revenue by main cantons in Manabí

Another way to evaluate the total revenue generated in the province of Manabí is by breaking it down at the cantonal level. Manabí is geographically divided into 22 cantons covering an area of 19,516.60 square kilometers and has a total population of 1,592,840 inhabitants, according to the 2022 Census (INEC, 2025).

As shown in Figure 6, Manta has been the canton that has generated the highest amount of tax revenue in the province throughout the study period. In 2010, Manabí collected $121.3 million. Of that total, Manta's contribution was $43.9 million, representing 36.2% of the total. Over the years, the contribution has been increasing, reaching a collected value of $145.9 million in 2024, which means an increase of 232.3% in this 14-year period.

Figure 6. Tax revenues in the province of Manabí by canton 2010-2024 (%)



Note: Comparative share of 2024 relative to 2010 is shown. Source: Internal Revenue Service (SRI, 2025).

Determinants of tax revenues in the province of Manabí

As indicated in the methodology, following the descriptive analysis of tax revenues in the province of Manabí, a model was developed using multiple linear regression according to equation (2). Before the estimation, the stationarity of the variables was verified using the ADF test by Dickey & Fuller (1979) and the PP test by Phillips & Perron (1988). The results in Table 1 show that the variables are not stationary in level data, but when the rate of change is applied, they become stationary, concluding that they are I(1).

Another aspect that was considered was determining the relationship between the study variable and the determining factors; to do so, Pearson's correlation coefficient was applied.

As can be seen in Table 2, the variable that has the strongest relationship with tax revenues is

Table 1. Stationarity test of the variables included in the model

CONTRASTS	DICKY-FULLER		PHIPLLIPS-PERRON	
Variables	Niveles	Tasa variación	Niveles	Tasa variación
Revenues	0,8682	0,0000	0,9769	0,0000
GVA	0,5446	0,0045	0,5359	0,0045
Tax Burden	0,8629	0,0000	0,9781	0,0000
Remittances	0,9923	0,0169	0,9833	0,0190

Note: prepared based on data on rates of change. Significance level at 5%. Source: prepared by the authors

Table 2. Pearson correlation coefficients of the variables included in the model

Independent variables	Correlation (r)	Strength of association (%)
Δ GVA	0,2525	25,2
Δ Tax burden	0,9485	94,8
Δ Remittances	0,0803	8,00

Note: prepared based on data on rates of change. Source: prepared by the authors

the tax burden, with 94.8%, which indicates that any change made in this area will be reflected in the improvement or otherwise of tax revenues (Márquez et al., 2018); Second is gross value added (GVA) at 25.2%, whose increase or decrease influences tax collection (Favila and Armas, 2018). Finally, remittances account for 8.0%, whose importance lies in the increase in tax collection via the consumption of goods and services (Bravo, 2020).

Table 3. Results of the econometric model

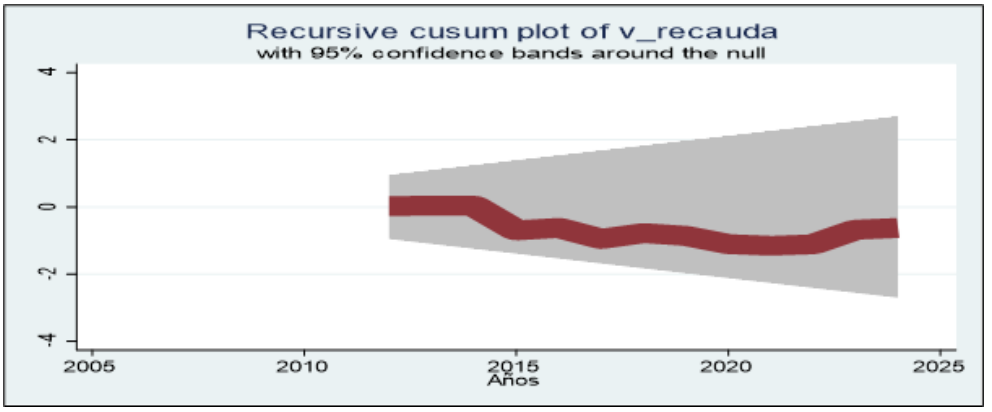
Independent variables	Statistics	Model 1
Constant	Coeficiente	4,5391
	Valor p	0,039
Δ Gross Value Added (GVA)	Coeficiente	0,4614
	Valor p	0,004
Δ Tax Burden	Coeficiente	0,924
	Valor p	0,000
Δ Remittances	Coeficiente	-0,3362
	Valor p	0,007
R-squared		0,9549
Adjusted R-squared		0,9445
F-statistic		91,84
Prob (F-statistic)F		0,000
AIC- Akaike		119,65
BIC-Schwarz		122,98

Note: prepared in accordance with the econometric procedure executed in the Stata program with data in constant values

Table 3 shows the results of the Multiple Linear Regression Model: coefficient, p-values, goodness-of-fit indicators, and joint significance. The econometric analysis concludes that the three variables included in the model are statistically significant at a level of 0.05 (5%) since their p-value is less than 0.05, indicating that each of them influences the behavior of national tax revenues collected in the province. Furthermore, the coefficient of determination shows that there is a high explanatory power, as 94.4% of the behavior of tax revenues is explained by GVA, tax pressure, and remittances. In addition, the p-value of the F statistic confirms that the model is jointly significant.

When performing the Cusum test (Ramírez-Loyola et al., 2022), a statistic of 0.4940 was obtained, which is lower than the critical value of 5% (0.947), so the null hypothesis H0 is accepted, showing that there is no structural change and confirming that the model is structurally stable throughout the study period. This is shown visually in Figure 7, where the cumulative sum of the residuals remains

Figure 7. Cusum test for estimated model



Source: own elaboration based on the estimated model

within the confidence band (95%).

Table 4. Model validation: main assumptions

Assumption	Diagnostic tests		
Correct model specification	Ramsey RESET test / Tukey's link test	6,0000	0,764
Normality of residuals	Jarque-Bera / Shapiro Wilk	0,6133	0,38778
Heteroskedasticity	White / Breusch-Pagan	0,1742	0,8220
Multicollinearity	Variance Inflation Factor (VIF)	<10	
Autocorrelation	Brusch Ggodfrey / Durbin Watson	0,7283	1,9265
White noise test	Box–Pierce Q test	0,7309	

Note: Prepared in accordance with the econometric procedure performed in the Stata program with data in constant values.

In addition to compliance with stationarity and the individual and joint significance of the variables, it is important to validate the model using the main assumptions in order to ensure the robustness of the results obtained (Stock and Watson, 2012). Table 4 reflects the different tests to which the estimated model was subjected, confirming the correct specification, normality of the residuals, homoscedasticity, absence of heteroscedasticity, absence of serial correlation, and the existence of white noise, concluding that the estimated model is statistically robust.

4. Discussion

According to Chamisa & Sunde (2024), in an informal economy with undiversified productive structures, there is a negative effect on tax collection when exemptions, poor enforcement, and tariff reductions predominate. An economy submerged economy may show little expansion of the tax base in contexts of informal employment and low productivity. In line with this, Dale, Reta, & Girma (2024) reveal that inflation has a positive relationship with taxes, and as shown by Chamisa & Sunde (2024), agriculture's share of GDP negatively affects tax revenues. Conversely, political stability, the services/GDP ratio, and inflation have a positive effect on tax revenues.

In addition, Shubham, Mittal, & Garg (2025) add that life expectancy and the level of corruption have a negative impact on tax collection and that priority should be given to trade liberalization and foreign direct investment, promoting financial development, and strengthening the political rights of citizens. According to this study, there is very little literature that specifically examines the determinants of tax collection for G-20 countries, which is also the case for LAC countries.

Following the analysis by Omodero (2025), in sub-Saharan Africa, inflation and FDI have a negative association with tax collection, but in the long term; in the short term, both have a significant positive impact. In this case, the author recommends a change that reduces inflation and increases the overall money supply, highlighting a healthy business climate and international trade as optimal measures.

These studies agree that macroeconomic variables are determinants of tax revenues, especially GDP, which reinforces the idea that economic expansion broadens the tax base. In addition to the dynamics of inflation on tax revenues depending on the time horizon analyzed. Likewise, the importance of the productive structure and formality of the economy in contexts where there is a high participation of informal or primary sectors, with characteristics of underground economies.

Unlike these studies, this research shows that, in the provincial case, GVA, tax pressure, and remittances have a very important explanatory power in tax revenues. However, the possibility remains open to test other variables, which due to the lack of statistical data were not included in the model as they are in the literature review presented.

5. Conclusions

The descriptive analysis shows that, at the national level, tax revenues in Ecuador have tended to grow significantly, both in total amounts and in each of the tax categories. Likewise, there is evidence of territorial concentration in four provinces with the highest level of taxation.

A similar situation is reflected in the province of Manabí, as tax revenues in the province have increased over time and show a concentration in four of the main cantons, with the largest share of tax revenues coming from value-added tax, income tax, and, in third place, motor vehicle tax.

The results of the model indicate its high explanatory power regarding variations in tax revenues. In this sense, the explanatory variable VAB suggests that economic growth has an impact by increasing tax revenues; that is, when productive activity, employment, and income increase, so does the tax base.

The tax burden variable has a significant influence on tax behavior and government actions, whether through adjustments to tax rates or various tax and administrative reforms in Ecuador, which have had a significant effect, as there is a strong positive correlation indicating that the policies of recent years have led to a strengthening of tax collection capacity. Efforts to prevent tax evasion and formalize the Ecuadorian economy have contributed directly to this, supporting the idea that fiscal policy plays an essential role in the country's financial sustainability.

The remittances variable, with a negative coefficient, suggests that an increase in remittances reduces tax collection; this behavior can be explained by the particular characteristics of the country; it is important to consider that, despite efforts to formalize the Ecuadorian economy, 43.7% of Ecuadorians were in the formal sector, 52.5% in the informal sector, and 3.8% in domestic employment in 2024 (INEC, 2024). This suggests that households receiving remittances could be using them for activities in the informal sector, which do not generate direct contributions to the tax system.

Despite the efforts of the SRI over the last 20 years, it is still necessary to design policies aimed at formalizing the economy, in addition to considering that the macroeconomic context and the country's policies can strengthen or weaken Ecuador's tax collection capacity. Therefore, it is considered that fiscal dynamics depend in part on these elements.

Authors' contributions

Miguel Tomalá Parrales: Conceptualization, data curation, formal analysis, methodology, supervision validation visualization draft writing

Aslie Moreira-Bermudez Conceptualization, data curation, formal analysis, research,

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The authors declare that they have no conflict of interest.

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