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Efficiency and Tax Gap in Latin America and the Caribbean: Value Added Tax and Corporate Income Tax



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Executive Summary

The aim of this study is to analyze the collection performance of the two primary components of tax revenues in our region's countries, namely the Value Added Tax and Corporate Income Tax. We estimate tax collection efficiency indicators and strive to decompose theoretical collection into its main components: effective tax collection, tax expenditures, and tax non-compliance.

The extended timeframe covered by the analysis allows us to observe that the levels of tax collection efficiency for both instruments currently surpass those of the past. At the same time, it is possible to perceive the sensitivity of tax collection efficiency to contextual phenomena when examining the results of the last three-year period covered by the study (2019–2021).

During the last considered triennium (2019-2021), the estimated tax collection efficiency for the VAT in the analyzed countries is 55.3% (similar to the average for the period 2016-2018, 55.1%)¹, while the tax gap is divided into 18.6% attributable to the policy gap generated by tax expenditures and 26.0% to inefficiency X or non-compliance gap. Specifically, in 2020, there is a significant drop in tax collection efficiency due to the effects of the pandemic, followed by a vigorous recovery in 2021.

In this same period, the estimated collection efficiency for Corporate Income Tax (CIT) in the selected countries is 42.2% (lower than the average estimated for the period 2016-2018, 46,5%)², while the tax gap consists of a portion of 10.9% attributable to the policy/tax expenditure gap and 46.9% to inefficiency X. In this case, the drop in collection efficiency is even more pronounced in 2021 than in 2020, a result attributable to the mechanics of corporate income taxation and the impact of fiscal relief measures implemented during the crisis stemming from the pandemic.

¹ CIAT – WP-01-2022: Efficiency and tax gap in Latin America and the Caribbean: Value Added Tax and Corporate Income Tax.

² Idem Note 2.

The efficiency of CIT is lower than that of VAT throughout the entire series. However, it is observed that the evolution of the former had a better performance, especially in the most recent periods, where the collection efficiency of CIT remained stagnant, narrowing the gaps between both indicators.

The interpretation of the results reveals that there are still areas for improvement, with inefficiency levels at the end of the series of 44.5% and 57.8% for VAT and CIT, respectively.

Inefficiency, or efficiency gap, is attributed to non-collection due to the existence of tax expenditures, as well as non-collection due to tax non-compliance. The proportions within the inefficiency of each of these components differ when analyzing VAT or CIT.

The breakdown of the components of theoretical collection shows that, while in VAT inefficiency is evenly distributed between the policy gap (tax expenditures) and inefficiency attributable to non-compliance, in CIT, the latter predominates, with a lesser presence of the weight of tax expenditures.

Introduction

The objective of this paper is to analyze the tax collection efficiency of the two main components of tax revenues in the countries of our region, the Value Added Tax and the Corporate Income Tax over a long period of time, up to the last few years, and to have an approach to the decomposition of the theoretical collection of these taxes in its main elements, effective tax collection, tax expenditures and tax non-compliance..

The collection capacity of a tax, or of a tax system, depends on a variety of factors.

In broad terms, during the design phase of a new tax or reforms to an existing one, understanding the scope of the taxable economic event, knowledge of the dimensions of the determinant variable(s), the tax rate, and the level of rates to be applied to the affected event, among other factors, will allow us to obtain preliminary estimates of its collection potential.

In a subsequent stage, with a more precise delineation of the instrument's scope, including the introduction of certain applicability exceptions, for instance, we may obtain a more accurate approximation of its actual revenue-generating capacity.

After being implemented and set in motion, we will observe the actual collection generated, which may differ from the initial estimates due to discrepancies between the predetermined and actual determinant variables, the greater or lesser impact of introduced exceptions, and the level of tax compliance.

The tax collection gap is the difference between the potential collection that would be obtained in a theoretical design and the actual collection achieved. The gap serves as an indicator of potential revenue losses and can be decomposed into two major categories: the *policy* gap and the *non-compliance* gap.

In 2011-2012, CIAT presented the study “*Estimating Tax Non-Compliance in Latin America*” This work was developed within the framework of the ITC/GIZ/CIAT Program for the development of Tax Administrations in Latin America and the Caribbean. The objective of that study was to initiate a discussion on the importance of measuring the economic dimension of the phenomenon of tax non-compliance, given the limited development of evasion measurements, particularly in corporate income taxes, up until that point.

That work compiled pre-existing estimates of evasion in the Value Added Tax (VAT) and Corporate Income Tax (CIT), revealing the limited availability of published estimates for the latter. Simultaneously, a specific methodology was introduced and applied, leading to an estimation of tax non-compliance for a set of countries in Latin America over a 10-year period. The estimated series included 14 countries and covered the period from 2000 to 2010.

On this occasion, the study will focus on two taxes that are pillars in the tax collection of countries in the region and worldwide. On one hand, the general sales taxes, typically the Value Added Tax (VAT), and on the other hand, corporate income taxes (CIT).

The quantitative analysis to be presented will leverage various pre-existing statistics on these taxes and, through an indirect methodological approach, provide an estimate of the composition of the potential annual collection of these taxes for 18 countries in Latin America over a 32-year period. Within the potential collection, the analysis will distinguish the proportion represented by effective collection, the collection gap attributable to tax expenditures, and the collection gap attributable to tax non-compliance.

Estimates of tax expenditures allow quantifying, at the level of each instrument and with the identification of their origin, the non-collection attributable to the presence of exceptions in the tax system, such as exemptions, reduced rates, extraordinary deductions, simplified regimes, etc. In other words, exceptions to the theoretical design of the tax that result in a reduction of revenue. These are revenue losses attributable to policy decisions,

often referred to as the policy gap. We quantify tax expenditures based on the exploration of the Tax Expenditure Database of CIAT (TEDLAC). The non-compliance or tax evasion gap is the second component of the difference between theoretical and effective tax collection³.

Understanding the total gap and each of its components allows us to better comprehend the lost revenue capacity of the tax, its origin, and what kind of measures to take to manage either. Concerning the non-compliance gap, as we will see, it is the less certain portion of the quantitative decomposition of theoretical collection. This study will present an approach to its quantification and evolution. Sizing up the phenomenon, its distribution in space, its evolution over time, and characterizing its components in greater detail while attempting to understand the implicit subjectivity in the various forms it manifests is essential for directing necessary actions to address it. Above all, for Tax Administrations. It involves measuring to understand and thus being able to act appropriately. CIAT (2012)⁴.

³ Keen (2013) uses the term “Policy Gap” to refer to revenue losses resulting from tax expenditures and employs the term “Compliance Gap” to address non-compliance in the VAT. See “The Anatomy of the VAT,” IMF Working paper WP/13/111. Barreix et al (2012) employ the terms “Inefficiency – G” to denote the value of the gap attributable to policy and “Inefficiency – X” to signify the value of the difference between the unit and the sum of the collection efficiency indicator plus Inefficiency – G. See “Recaudar No Basta, Los Impuestos Como Instrumentos de Desarrollo,” Chapter 9: “El IVA, que sea lo que es,” “Inter-American Development Bank “ (2012). Although both documents refer to the Value Added Tax, we will extend this terminology to Corporate Income Tax as well.

⁴ Inter-American Center of Tax Administrations. Pecho, Miguel; Sánchez, Jorge; Peláez, Fernando: “Estimating Tax Non-Compliance in Latin America”.

1 Common Characteristics of the Two Main Instruments of Tax Collection

While from an economic standpoint, in their design, in the nature of each tax, and in our understanding of them, they are different entities, these possess certain common elements that, for the purposes of this study, warrant their joint examination.

From the perspective of tax incidence analysis, which aims to determine who effectively bears the tax burden, the effects on income distribution of one tax or the other are different. From this standpoint, it is understood that while the legal incidence of these two taxes usually falls on the same entity (the company as the taxpayer), the Value Added Tax (VAT) is transferable forward in the process of production and marketing, whereas the same does not occur with Corporate Income Tax (CIT), which is internalized by the taxpayer. Legal incidence refers to who is the subject named by the law as the tax obligor.

Tax shifting is the process by which the taxpayer seeks to recover the loss that the payment of the tax has entailed, attempting to restore their situation to the state prior to the imposition of the tax.

From the perspective of individual accounting, the VAT is a periodic obligation of the company to the tax authorities, originating as the net value of liabilities generated with each taxable sales transaction, minus the assets generated with each purchase transaction when the VAT included is deductible. Therefore, the tax does not alter the economic result of the company. The CIT is also a periodic obligation, but unlike the VAT, this tax does alter the economic result of the company. It determines, after the realization of the company's accounting income, the result after direct taxes. In line with the tax shifting process mentioned earlier, the VAT, an indirect tax, is shifted outside the company, while the CIT, a direct tax, is absorbed or internalized by the company.

The first common characteristic we identify is that both taxes have the same legally affected subject, the same taxpayer, which is the companies. In other words, it is the companies, or more generally, depending on the scope established in the tax regulations of each country, the productive units that combine factors of production, both

owned and borrowed, to obtain an economic result, and are obligated to the documentation, determination, declaration, payment, and other obligations related to both taxes.

The second common factor of both tax categories is related to the tax base, or rather, the manner in which the determination of the tax base is conducted.

The tax base can be defined as the magnitude that allows determining or quantifying the tax obligation. Based on this definition, we can assert that both taxes partially share the main determining variables of the calculation base. While the tax base of the VAT is determined as the difference between the inputs and the outputs subject to tax, with some specific determination rules, the tax base of the CIT is determined as the difference between total inputs and total outputs, with some specific determination rules.

Revenue, sales, or income are, to a large extent, the primary input factors for determining the tax base for both VAT and CIT. Due to their magnitude, sales are the main determining variable for both taxes and are under the control of the company. On the other hand, purchases or expenditures are part of the VAT outputs, as long as they are taxed and may be part of the CIT outputs, to the extent that, in the fiscal year, these purchases are consumed to generate income.

A relevant difference between the taxes is the acquisition of long-term assets, fixed assets, or capital goods. To the extent that they are subject to VAT, the general tax regulations typically allow the company to recover the entire tax included in the purchase in the same period. Meanwhile, the value of the asset is deductible for CIT gradually, following the depreciation rules established by the tax regulations.

On the other hand, there are other expenditures that are not subject to VAT but do form part of the outputs for determining the tax base of CIT. The most typical and probably the most relevant case, due to its relative weight, is salaries and social security contributions, not subject to VAT but deductible expenditures for CIT.

This high connection in the form and calculation of the tax base for both taxes determines that certain changes in inputs or outputs have simultaneous effects on both tax bases. For example, a decrease in revenue in an economic period negatively impacts the tax base of both VAT and CIT, reducing them. Similarly, an increase in revenue, even accompanied by an increase in outputs, will likely lead to an increase in the nominal tax base for both taxes, thereby increasing tax collection

2 Tax Gap Estimation Methodologies

The two major perspectives for estimating the tax gap, or tax evasion, the top-down and bottom-up methods, also called indirect methods and direct methods, have advantages, disadvantages and different uses.

While indirect methods start from macroeconomic indicators, national accounts data, or national survey data to estimate the theoretical base and potential collection, direct methods mainly rely on administrative data and are intensive in their usage.

Some direct estimation methodologies can provide an overall result of the tax gap, although they usually have a more specific focus, providing results for groups or subsegments of taxpayers. Additionally, these methodologies are often more applicable for specific actions that the administration can carry out subsequently toward compliance.

Rubin (2011)⁶, points out that while both the direct and indirect methods provide an uncertain estimate of the total tax gap, the former has the significant advantage of offering operationally useful information for the Tax Administration. The detailed breakdown of the tax gap, essential for a bottom-up approach, enables a better prioritization of the administration's resources to maximize tax collection.

The most representative direct methods, widely discussed in the literature but less practically implemented and disseminated, are those based on audits. If we had the capacity to conduct exhaustive audits of all taxpayers in the registry simultaneously, while also being able to identify and audit, quantifying equivalent tax bases in the informal economy, we could accurately determine the magnitude of evasion and fully characterize it. In such a scenario, the administration would leverage this information to quantify the tax debt and proceed with its enforcement. However, this is not feasible.

⁶ The practicality of a top down approach to the direct tax gap. Marcus Rubin. Her Majesty's Revenue and Customs, United Kingdom (2011).

Auditing is the most labor-intensive activity for tax administrations. The *audit* rate (the ratio between the number of taxpayers audited in a fiscal year and the total number of taxpayers on the registry) often indicates that, a priori, the probability of any given taxpayer being audited during the tax prescription period is low.

Audit samples can be useful for making inferences about the behavior of non-compliance based on the results obtained from a selected subset. The objectives and characteristics of the sampling process will determine whether or not the results can be extrapolated to the entire population.

Random audit programs are applied to randomly selected taxpayers to be representative of a broader population that the sample aims to represent, whether it be an economic sector, a geographic area, or the entire population. A random sample allows us to infer results for the represented population with a known level of error, enabling us to quantify and characterize the phenomenon. This methodology can be enhanced by incorporating standardized surveys for the sampled entities, allowing us to also understand subjective aspects of evasion.

In practice, these methodologies are not frequently applied in their most general form. Audits should be conducted by the tax administration itself, which will have to allocate a significant portion of its audit capacity to this service. Given the heterogeneity of taxpayers, it is likely that the sample size aiming to represent the entire population will be comparable to the number of audits regularly conducted. At the same time, the average performance of an audit of a randomly selected taxpayer will be lower than that usually obtained⁷.

These obstacles result in this methodology receiving limited resources and necessitate its application to represent not the entire population but rather subsets of it—solely a specific sector, or an industry chain, a geographic area, etc.—using smaller samples, or alternatively, not being implemented.

A more commonly employed direct method involves leveraging the results of routine audits. This analysis does not interfere with the audit process and allows, by systematizing the results of current audits, to estimate the *evasion found by the tax administration*. Determining the evasion found is useful for evaluating the results of the audit strategy and allows us, using the general evasion results and indirect methods, for example,

⁷ This is due to the fact that management has selection processes that identify the highest non-compliance.

to infer the tax administration's capacity to select and recognize the tax debt. If the relation or ratio between the *evasion rate found* and the *general evasion rate* is higher than 1, it means that the administration is capable of targeting taxpayers with higher levels of relative noncompliance, the further away from 1, the greater this capacity will be. A ratio below unity would indicate that the audit results are lower than the average evasion rate, which would suggest that the administration's capacity to select and recognize tax debt is weak.

It is advisable to implement more than one perspective of evasion analysis. The contrast between the results of the indirect methodologies and the evasion found by the tax administration is an interesting and low-cost combination that provides results that may be useful to revise the enforcement strategy.

There is a variety of other techniques based on tax information. An interesting reference, especially for the CIT is the HMRC report (2008)⁸, and the *Tax Gap Project Group - TGPG* (2018)⁹. The latter identifies a number of econometric techniques based on tax information, such as matching techniques to compare companies, specifically cross-country income transfers by multinational¹⁰ companies.

For TGPG, direct methods offer several significant advantages, along with result certainty. Firstly, this approach can serve as a guide to identify the causes of evasion, as it focuses on a specific component with uniform and well-defined characteristics among its elements. Secondly, they provide greater certainty and precision in estimations due to the increased granularity demanded by these approaches. Random audits, in particular, enable the identification of sectors or regions with a wider gap and the more vulnerable areas of taxation. This allows for incorporating adjustments to mitigate evasion.

As a primary disadvantage, they also point out that the approach is resource-intensive, particularly if based on random audits. They add that the matching method also requires data, in addition to intricate preliminary calculations, demanding variable data that may consume a considerable amount of time. HMRC (2008) acknowledges this same limitation but suggests that top-down methods have the potential to support the estimation of certain elements of the direct tax gap.

⁸ HMRC Working Paper No. 12. The practicality of a top-down approach to the direct tax GAP..

⁹ The concept of tax GAPS Report II: Corporate Income Tax Gap Estimation Methodologies. FISCALIS Tax Gap Project Group (FPG/041). European Commission. Directorate-General Taxation and Customs Union.

¹⁰ See: Federico Sallust. UNCTAD Research Paper No. 64. Measuring profit shifting in Italy with propensity score matching and receiver operating characteristics analysis (PS-ROC) method.

On the other hand, indirect methods typically offer a more comprehensive overview of the tax gap, generally representing total measurements of a tax gap. This allows for an understanding of the phenomenon's scale and its evolution over time. Their main limitation lies in the difficulty of incorporating these results as indicators supporting specific actions by the administration. These estimates do not provide answers to the question of why non-compliance occurs, or why certain areas or sectors are not paying taxes properly.

Among the most recognized and widely disseminated indirect methodologies are those based on National Accounts. Even though these methods have lower data requirements, developing the estimation will still necessitate having the appropriate dataset, and it should be explanatory of the taxable base intended for estimation. Alternatively, adjustments may need to be introduced to align macroeconomic variables with the taxable bases of the taxes under analysis.

To apply direct methods for estimating potential revenue collection based on National Accounts data, it would be ideal for this information source to be generated independently of tax information. While the Tax Administration is not typically responsible for producing National Accounts information, there are often information exchanges with the entities responsible for its production.

UN (2008)¹¹ suggests that it would be desirable for macroeconomic accounts of sectors or the overall economy to be directly obtained by aggregating data from individual units, information that the Tax Administration largely possesses. According to the document, using this information would bring analytical advantages by having microeconomic databases compatible with the corresponding macroeconomic accounts of sectors or the overall economy. However, the document acknowledges that even when accounts or records of individual institutional units are available, the concepts necessary or suitable at the microeconomic level may not be appropriate at the macroeconomic level.

Even if National Accounts do not make use of administrative data, tax collection and the revenue collection from each specific tax, in a given period, constitute a macroeconomic variable in itself—real, accounted for, verifiable, and typically available before the National Accounts for the same period. This characteristic of macro tax data transforms it into a source, at the very least, for verifying coherence with National Accounts and their evolution.

¹¹ System of National Accounts 2008. United Nations Statistical Commission.

The interdependence between the explained variable and the recording of the explanatory variable can introduce interference in estimating the tax gap through indirect methods.

These weaknesses, however, do not deter us from proceeding with estimations using the aforementioned methodologies. It is essential to be mindful of this interdependence, enabling us to better assess the estimation results.

2.1. The practice of Tax Gap Estimation by CIAT countries

The ISORA (2020)¹², provides information from tax administrations in 159 countries, representing 90.37% of the global GDP and 88.5% of the world's population in 2017 (over 6.6 billion people). Among them are 37 member countries of CIAT, accounting for 39% of the GDP and 37.1% of the population¹³.

The survey contains questions regarding the practice of estimating and publishing evasion estimates for VAT, CIT, personal income tax (PIT), and other taxes by tax administrations. In the following table, we summarize the results of the responses from countries in the region.

¹² International Survey on Revenue Administration (IMF, IOTA, OECD, ADB and CIAT).

¹³ CIAT (2021).

Table 1: Estimations and Publications of Tax Evasion Studies

COUNTRIES / TAX GAP ESTIMATIONS	VAT		CIT	
	Periodic Tax Gap Estimations	Tax Gap Publications	Periodic Tax Gap Estimations	Tax Gap Publications
Argentina	Yes	No	Yes	No
Bolivia	Yes	Yes	No	No
Brazil	No	No	No	No
Chile	Yes	Yes	Yes	No
Colombia	Yes	Yes	Yes	Yes
Costa Rica	Yes	Yes	Yes	Yes
Dominican Republic	Yes	No	Yes	No
Ecuador	Yes	No	Yes	No
El Salvador	Yes	No	Yes	No
Guatemala	Yes	Yes	Yes	Yes
Honduras	Yes	No	No	No
Jamaica	No	No	No	No
Mexico	Yes	Yes	Yes	Yes
Nicaragua	No	No	No	No
Panama	No	No	No	No
Paraguay	Yes	Yes	No	No
Peru	Yes	Yes	Yes	No
Uruguay	Yes	Yes	No	No
Estimations & Publications	14	9	10	4

Source: Based on ISORA 2020

The table allows us to observe that out of a total of 18 countries analyzed, 14 claim to carry out estimations of evasion in VAT, while 9 of them publish the reports and results. Regarding CIT, 10 of the countries under analysis state that they estimate evasion in CIT, with only 4 of them mentioning that they publish the results of evasion studies for this tax. These results indicate that the practice of estimating evasion is not yet fully widespread, and especially in CIT, the situation is similar to what we highlighted in our previous work. There is a lower number of estimations for the corporate income tax.

2.2. Tax Gap Approach based on Revenue Collection Efficiency

One way to approach the tax gap through indirect methods is by using tax efficiency indicators.

A tax efficiency indicator begins with estimating the potential revenue collection of a tax and then contrasts the observed collection with its theoretical potential.

In the following section of this work, we will present our own estimations based on tax efficiency indicators for VAT and CIT. Additionally, we will leverage information on tax expenditures from the countries under analysis to decompose the efficiency gap into two components: *policy gap* and *non-compliance gap*. Next, we will outline the calculation of this indicator for each tax.

2.3. VAT Revenue Collection Efficiency

In the case of VAT, *C-efficiency*, or the VAT Revenue Ratio (VRR) are widely used tools for the analysis of the tax's performance and revenue evolution. It allows policymakers to understand the tax's capacity to increase its revenue-providing ability. According to Keen (2013)¹⁴, this indicator has become a widely used tool for evaluating VAT, implicitly comparing the actual revenue collected by a VAT with the revenue that would be obtained if the tax were applied perfectly at a uniform rate, equal to the standard rate, on all consumption without exceptions.

According to OECD (2010)¹⁵, the objective is to provide comparative measures of countries' ability to effectively secure the potential tax base of VAT and it proposes the VRR ratio. The resulting ratio will be between 0 and 1 since the tax collection will be less than the potential collection due to the existence of exceptions and evasion. The indicator's value will indicate how efficiently the tax is collecting revenue. The closer the value

¹⁴ The Anatomy of the VAT. Fiscal Affairs Department. IMF Working Paper. WP/13/111. Michael Keen.

¹⁵ Consumption Tax Trends 2010: VAT/GST and Excise Rates, Trends and Administration Issues. Measuring Performance of VAT. The VAT Revenue Ratio. OECD.

is to 1, the higher the efficiency of the VAT analyzed (lower tax expenditures, lower levels of evasion). The key lies in identifying and accurately quantifying the Taxable Base. The formulation of the indicator is as follows:

$$VRR_{VAT} = \frac{VR_{VAT}}{B_{VAT} \cdot r_{VAT}}$$

Thus:

VR = VAT Revenue

B = Potential Taxable Base

r = Standard VAT rate

In the numerator, we have the VAT Revenue. While collection records for a period (such as annual records) are typically available, for the precise estimation of a fiscal year, it is ideal to have the tax accrued in the same time frame in which we have the record of the Potential Taxable Base.

The Potential Taxable Bases we will use for our analysis are expressed in the calendar year. In the practice of tax determination, tax obligations must be paid at a date later than the occurrence of the taxable event. This practice implies that collection records have a temporal lag compared to the taxable base. This lag could result in changes in collection efficiency in one fiscal year being attributed to the following year. If we aim to arrive at a long-term perspective on collection efficiency, we can compare potential revenue and actual cash collection, prioritizing the trend of the ratio over specific values found.

The denominator contains two elements:

The standard VAT rate, for the purposes of this indicator, refers to the rate stipulated in the legal regulations of the VAT in the analyzed country. The objective is to apply the standard rate to the entire taxable base to calculate the potential revenue that would be obtained if the tax were applied perfectly at a uniform rate, covering all consumption without exceptions. The practice of these taxes reveals that they apply a uniform rate to the majority of goods and services, with specific lists of exceptions for certain transactions based on objects, subjects, the geographical area where transactions take place, among other factors. The standard rate, therefore, is derived from the tax regulations.

The second element we find in the denominator is the Taxable Base. For the indicator we are analyzing, this variable will be provided by the National Accounts System.

The Value Added Taxes, or general sales taxes on goods and services, particularly the ones we are analyzing for this group of countries, generally take the form of taxes imposed on the circulation of goods and services at all stages of production and marketing, up to the final stage, excluding exports. While the selling companies are formally referred to as taxpayers or contributors, in practice, the tax is transferable forward. It is an indirect tax, with the ultimately affected party being the final consumer or, more generally, any buyer who is not entitled to tax credits (final consumers, non-profit institutions, the central government, etc.).

Given the available statistical datasets of countries¹⁶, we will resort to certain categories of the Income and Expenditure Account of the National Accounts System of each country as an approximation to the final taxable base. The income and expenditure account illustrates how households (HH), government units (GU), and non-profit institutions serving households (NPISH) allocate their disposable income between final consumption and savings (UN 2008)¹⁷.

The expenditure on the final consumption of households is the spending by resident households on goods or services for consumption. It includes, among other things, the direct purchase of goods and services, as well as goods and services produced and consumed within the same household.

The income and expenditure account also includes spending on goods or services, both individual and collective, by the government, as well as by the NPISH.

As expressed in the Manual of the National Accounts System, the value of the effective final consumption of the general government is equal to the value of its total final consumption expenditure minus its expenditure on individual goods or services supplied to households as social transfers in kind. The value of the effective final consumption of government units is therefore equal to the value of the expenses they incur in providing

¹⁶ The macroeconomic statistics used for estimating the potential tax come from the National Accounts Systems of the countries or from statistics available through UNdata, a United Nations database service providing official data and statistics, or from statistics available on DataBank, a World Bank tool for analysis and visualization containing datasets on various topics.

¹⁷ National Accounts System. 2008. European Commission. International Monetary Fund. Organisation for Economic Co-operation and Development. United Nations. World Bank. ECLAC Edition.

collective services or certain individual goods or services. A similar criterion must be adopted to account for the consumption of NPISH. The value of the effective final consumption of NPISH must be equal to the value of their total expenditure on final consumption minus their expenditure on individual goods or services supplied to households as social transfers in kind.

This approach to the theoretical taxable base that we will construct will be determined by the sum of the three factors mentioned earlier, from which we will subtract the actual record of tax collection. This is done as the valuation rules for these accounts indicate that spending is accounted for by the total consideration paid or valued, which includes, among other things, the sales tax or VAT.

$$VRR_{VAT} = \frac{VR_{VAT}}{[HH + GU + NPISH - VR_{VAT}] \cdot r_{VAT}}$$

Based on this approach, in the denominator, we estimate the Theoretical VAT Collection (TCVAT) by applying the standard legal rate of the tax to the mentioned amount. As we know, VAT is a tax that applies to the general circulation of goods and services, with a general legal rate and a set of exceptions: exempted goods and services, goods taxed at the minimum rate, etc. The theoretical collection will thus seek to demonstrate the revenue collection potential of a tax that applies a uniform rate to all goods and services without exceptions.

$$TC_{vat} = [HH + GU + NPISH - VR_{VAT}] \cdot r_{VAT}$$

As mentioned earlier, the result of the ratio should fall between 0 and 1. The difference between one and the found VRR will be termed as revenue collection inefficiency¹⁸. Revenue collection inefficiency represents the total gap between the theoretical tax and the effective tax.

¹⁸ To the extent that we accurately identify the taxable base of the tax and the National Accounts System captures the entirety of the proposed expositional base, if the taxable base is underestimated, we might arrive at an efficiency indicator exceeding 1. Conversely, if the variables are overestimated, we would determine an index lower than the actual, giving us the perception that the tax is less efficient than it truly is.

At this juncture, we inquire: What constitute the components of the overall gap? As mentioned earlier, exceptions exist regarding the application of the statutory rate on the taxable base: exempted goods and services, items taxed at the minimum rate, specific credits, or deductions solely for tax purposes, and so forth.

The set of exceptions within a tax are identified and assessed in the reports on tax expenditures produced by countries. CIAT follows these reports and maintains a systematic record of tax expenditures at the national level¹⁹, considering factors such as tax, fiscal year, type of tax expenditure, among other variables. With this information, we ascertain what is referred to as the policy gap.

Regarding the policy gap, Keen (op. cit.) and various authors acknowledge this component, essentially attributing it to tax expenditures calculated under the assumption of full compliance. The policy gap may manifest in gaps attributable to different characteristics of the exceptions included in the tax. Díaz de Sarralde (2017)²⁰, labels this concept as “G-Inefficiency”.

We will distinguish between the unit (which is equivalent to the total revenue collection efficiency based on theory), the revenue collection efficiency index, and the portion of inefficiency caused by the policy gap. To achieve this distinction, we will calculate a residual value. Barreix et al (2012)²¹, term this difference as “X-Inefficiency”, drawing an analogy to the concept applied to designate explanatory components of internal efficiency losses in a firm that are not explicitly defined. .

Under the assumption that the selected variables accurately reflect the taxable base of the tax, and the identification and estimation of tax expenditures are comprehensive and consistent with these variables, we could attribute this differential entirely to non-compliance. Keen (op. cit.) labels it as the *non-compliance gap*. In practice, even the best selection of macroeconomic variables will not perfectly explain the taxable base of

19 Refer to TEDLAC. Tax Expenditure Database. Available at: <https://www.ciat.org/gastos-tributarios/>

20 Value Added Tax: Revenue, Efficiency, Tax Expenditures, and Inefficiencies in Latin America. Santiago Díaz de Sarralde Miguez. Inter-American Center of Tax Administrations (CIAT 2017).

21 Value-added tax: let it be what it is, from Recaudar no Basta: Los impuestos como instrumento de desarrollo. Chapter 6 Alberto Barreix and Fernando Velayos, in colaboración with Luis Cremades, Fernando Díaz Yubero, Miguel Pecho, Óscar Vázquez, Manuel Alarcón, Domingo Carbajo, Horacio Castagnola, Patricio Castro, Santiago Díaz de Sarralde, Rocío Ingelmo, Raúl Junquera, Gaspar Maldonado, Manuel Márquez, Enrique Rojas and Marcio Verdi.

the tax under analysis. Additionally, studies on tax expenditures have some weaknesses in their construction, and often the estimation base for these studies is not macroeconomic accounts but rather tax microdata. Therefore, the final gap, the identified differential, will be attributable to various concepts, including tax non-compliance.

2.4. CIT Revenue Collection Efficiency

Previously, we mentioned that, in the case of the VAT, C-Efficiency or the Value-Added Tax Revenue Ratio (VRR) are widely used tools for analyzing the development and evolution of tax collection. These tools implicitly compare the actual revenue collected by VAT with the revenue that would be obtained if the tax were applied perfectly at a uniform rate, equal to the standard rate, on all consumption, without exceptions.

Estimating the gap based on tax revenue efficiency is not as prevalent in the case of CIT, nor are estimates (or publications of estimates) of tax gaps in this tax widely spread through other variants of indirect methods or through some of the methodologies entirely based on tax data, as discussed earlier. This observation is evident in the summary table of ISORA.

Rubin (2011)²², provides a detailed list and characterization of these estimates, suggesting that one of the reasons for their slower progress is the degree of dependence on macroeconomic variables tied to tax authority data. According to this author, this endogeneity is more pronounced in macroeconomic variables related to income than to consumption, becoming one of the factors explaining the limited extent of estimates (or publications of estimates) for the CIT compared to the VAT. Another obstacle, as noted by the author, relates to the difficulty of converting Gross Operating Surplus into the taxable base of the corporate income tax.

In practice, Corporate Income Taxes, Business Income Taxes, or general taxes on corporate profits, collectively referred to here as CIT, typically arise from applying a proportional tax rate to the economic outcomes (accounting results) of companies, adjusted for tax purposes. The economic results undergo certain tax adjustments, thus determining the taxable base, or the fiscal outcome.

²² The practicality of a top-down approach to the direct tax gap. Marcus Rubin. Her Majesty's Revenue and Customs, United Kingdom (2011).

Given the method for determining the calculation base of the CIT and the available statistical data sets of countries, we will resort to certain items in the Income Generation Account that reflect the portion of value added distributed to capital. The Generation of Income Account is a subaccount of the Primary Income Distribution Account (UN – 2008). In this subaccount, value added is distributed among labor (compensations), capital, and government (taxes minus subsidies). The portion attributable to capital is reflected in the balance of this account, known as the Gross Operating Surplus and/or Mixed Income.

The accounting balance of the Generation of Income Account, representing the portion of value added distributed to capital, is the result of deducting the Compensation of Employees and taxes minus subsidies on production from the Gross Value Added. This balance measures the surplus or deficit generated from production.

This accounting balance is known as Gross Operating Surplus or Mixed Income in the case of businesses not incorporated as companies owned by households, where the owner contributes labor and their compensation cannot be distinguished from the returns obtained as an entrepreneur.

Conceptually, the balance of the Generation of Income Account will differ from the consolidation of companies' accounting results, as the former are expressed in national accounts in gross terms, without considering the consumption of fixed capital or the compensation for financial services received or provided.

The consumption of fixed capital refers to the decrease, during the accounting period, in the current value of the stock of fixed assets owned and used by a producer, resulting from physical wear and tear and normal obsolescence. The equivalent term from an accounting perspective is the depreciation or amortization of fixed assets. On the other hand, compensation for financial services refers to payments due on financial assets or natural resources received on loan or leased by the company, or any interest, rent, or similar income receivable for financial assets or natural resources owned by the company (UN – 2008).

The majority of statistics available for this estimation present the balances of the generation of income accounts in gross terms. To approach the net accounting result of companies, we deduct from this balance an estimate of the consumption of fixed capital. This estimate is linked to the Gross Capital Formation account in

the Use of Income Account. Gross capital formation includes the acquisition of new and existing fixed assets through purchase, barter, or capital formation by the enterprise, less the disposal of existing assets through sale or barter (UN 2008).

The contrast between the theoretical revenue obtained by applying the current tax rate in each country/ exercise to the theoretical taxable base and the actual revenue collected will be the revenue collection efficiency of the CIT. The difference between unity and the thus-found revenue collection efficiency will be termed *revenue inefficiency*. With information on Tax Expenditures in this tax, we can determine the portion of the gap associated with policy gap or *G-inefficiency*, while *X-inefficiency*, which would encompass tax evasion, is the difference between unity, revenue collection efficiency, and *G-inefficiency*, much like expressed for the VAT in the preceding subsection.

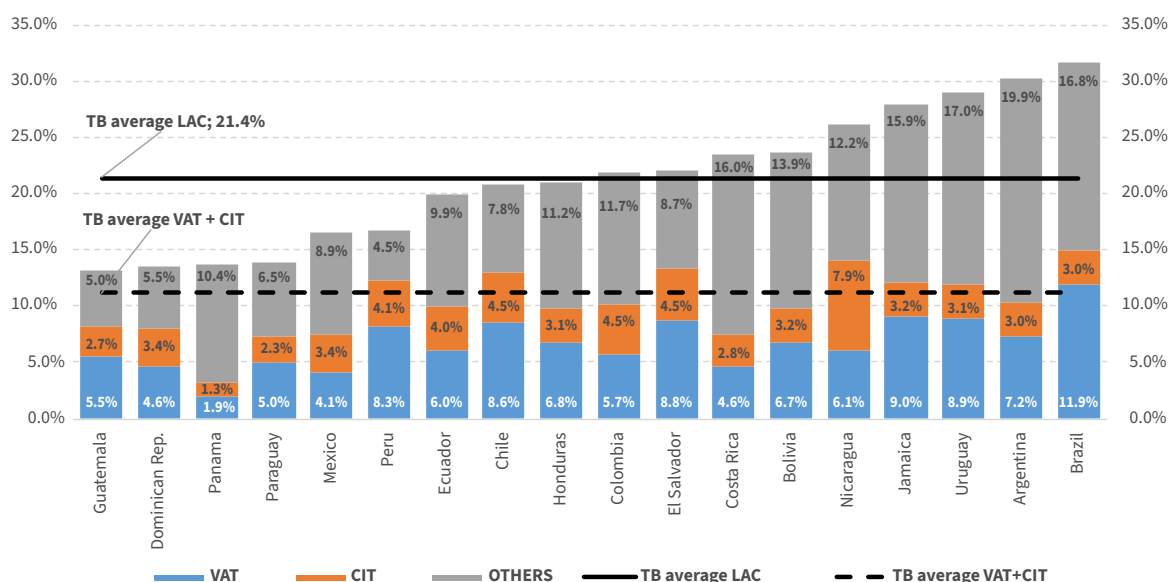
In the following section, we will present some relevant statistics for these two taxes in Latin American countries, followed by the development and results of the estimations of revenue collection efficiency and the components of the tax gap.

3 Presence in the Collection of VAT and CIT

As mentioned, this work will focus on two taxes, which are pivotal pillars of tax revenue collection in countries across the region and the world. On one hand, we have the general sales taxes, typically the Value-Added Tax (VAT), and on the other hand, we have taxes on business incomes, which we will refer to as Corporate Income Taxes (CIT).

Using revenue series data (BID-CIAT 2023)²³, and the tax collection records of countries, with a particular focus on value-added taxes or sales taxes and taxes on business incomes, in relation to the Gross Domestic Product series of countries, we can estimate the overall tax burden and specifically assess the impact of VAT, CIT collections, and the rest of the components.

Figure 1: Tax Burden: Total, VAT and CIT. Latin America and the Caribbean
Average 2019 - 2021



Source: Prepared by the authors based on IDB&CIAT statistics and national accounts series of the countries.

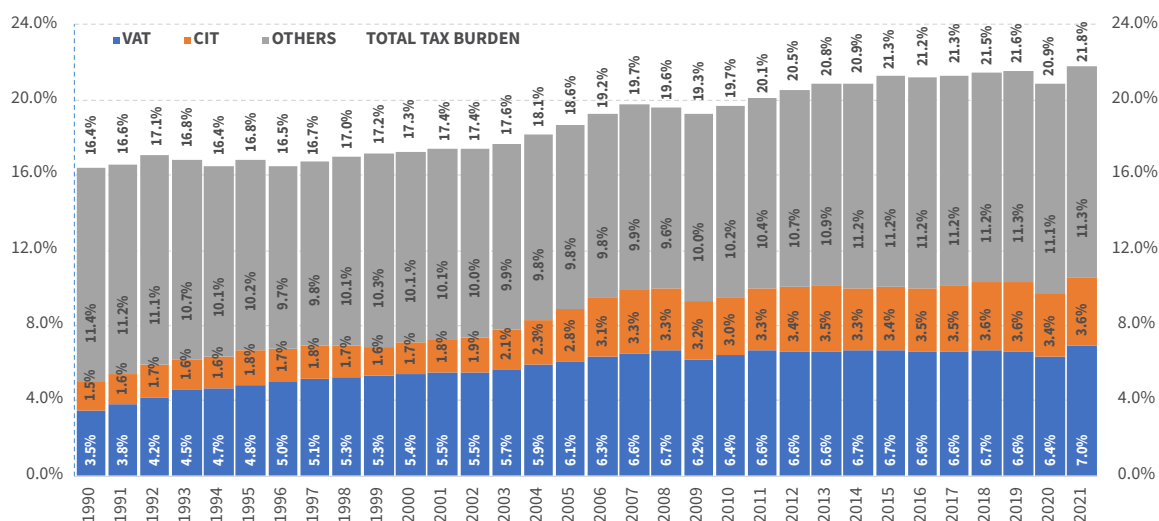
²³ Equivalent Fiscal Pressure in Latin America and the Caribbean. IDB & CIAT 2020. <https://www.ciat.org/base-de-datos-de-recaudacion-bid-ciat/>

In the last recorded period (2019 to 2021), we can observe that the average tax burden of the considered countries amounted to 21.4% of the GDP, on average. The specific tax burden of VAT and CIT accounts for almost 50% of the total tax burden, with varying degrees of presence for each of these components in different countries.

Regarding Value-Added Tax (VAT) type taxes, we observe the lowest records of tax pressure in the analyzed period, specifically in Panama. – 1.9% - (*Impuesto sobre la Transferencia de Bienes Corporales Muebles y la Prestación de Servicios –ITBMS*, general rate 7%); Mexico – 4.1% - (*Value Added Tax – VAT*, general rate 16%); Costa Rica – 4.6% - (*General Sales Tax – GST*, general rate 13%). On the other end, we find higher VAT tax pressures in the region in Jamaica – 9.0%- (*General Consumption Tax – GCT*, general rate 15.0%); Uruguay – 8.9% (*Value Added Tax – VAT*, general rate 22%) and Brazil – 11.9% - (We have identified more than one type of VAT in Brazil, the *Imposto sobre Circulação de Mercadorias, Bens e Serviços- ICMS*, the *Imposto sobre produtos Industrializados – IPI*, and the *Programa de Integração Social & Contribuição para o Financiamento da Seguridade Social PIS/COFINS*).

The figure allows us to appreciate that Corporate Income Taxes (CIT) have a relatively lower presence in tax pressure compared to the pressure from Value-Added Taxes (VAT). Nevertheless, the weight of this tax is significant, constituting more than half of the weight of the VAT, and as mentioned, both taxes together represent around 50% of the average tax burden for the countries in Latin America and the Caribbean. Nicaragua stands out as the country with the highest CIT tax pressure (Corporate Income and Profits Tax, and Income and Profits Tax, 7.9% average tax burden 2019 - 2021). Chile presents a CIT pressure of 4.5% on GDP (the series of this statistic includes First Category Tax, Additional Tax of 40% on Public Companies Rate 8% Transitory Art. 6 Law 18985 and Specific Tax on Mining Activity). Among those with the lowest figures are Panama 1.3% (Corporate Income Tax - IT, legal rate 25%), Paraguay 2.3% (Tax on Business Income, formerly Tax on Income from Commercial and Industrial Activities - IRACIS, and Tax on Agricultural Income - IRAGRO, legal rates 10%).

Figure 2: VAT Tax Burden, CIT Tax Burden, Others Tax Burden, long term.
Average of Latin American and Caribbean countries. 1990 - 2021



Source: Based on IDB&CIAT revenue statistics database, country revenue collection and National Accounts series.

In a long-term perspective, we can observe how the average tax burden in Latin America and the Caribbean has consistently increased year after year (with exceptions in 2008, 2009, and 2020). While in 1990, tax collection revenue represented 16.4% of the GDP, in 2021, the tax burden was 21.8%, marking a growth of 0.9% of the GDP compared to the year 2020.

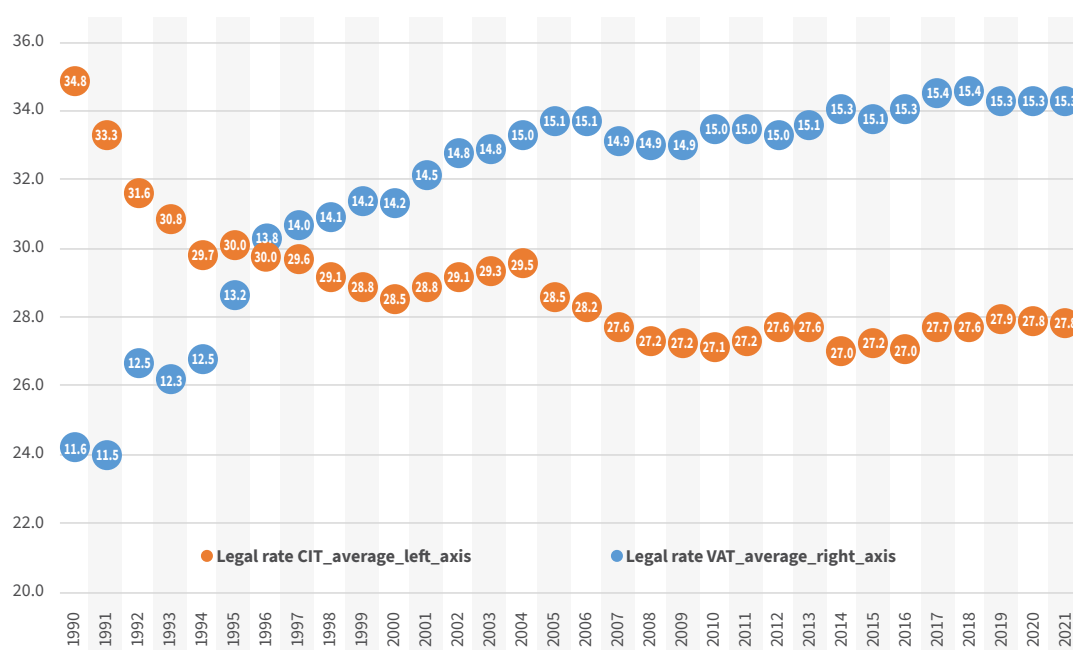
The figure illustrates that the two components under analysis, VAT and CIT, are the ones explaining this growth, as the “Others” segment remained at levels of 10 to 11% throughout the series²⁴. At the same time, both are sensitive to the context, being the ones that most explained the declines in 2008 and 2020.

Currently, VAT and CIT together account for nearly 50% of the average tax burden in Latin America and the Caribbean, whereas at the beginning of the series, both had a 30% share in the average tax burden. This increased participation of both components is explained by successive reforms concentrated on these taxes, implemented by countries in the region. These reforms aimed at expanding taxable bases, reducing exceptions, and enhancing the focus of Tax Administrations on the management of these taxes.

²⁴ Within the “Others” category, although the series has remained stable over time, there is no homogeneous behavior among its components, since some items, such as PIT, have shown a greater participation in the tax burden as a result of reforms to strengthen this tax category imposed by several countries in the region, while others have had a reduction in their presence in the tax burden, such as excise taxes or taxes on foreign trade.

Within the remaining components of countries' tax burden, there are numerous tax categories, among which contributions to social security, excise taxes, and personal income taxes stand out.

Figure 3: VAT and CIT Legal Rates. Average of LAC.
1990 - 2021



Source: Prepared by the authors, based on Tax rate CIAT series and country legislation.

In the realm of tax rates, particularly in the context of levies applying proportional rates to the taxable base, there has been an incremental rise observed in the Value-Added Tax (VAT) rates across nations. However, this trend exhibits a degree of heterogeneity, accompanied by a discernible inclination towards convergence in Corporate Income Tax (CIT) rates.

At the beginning of the series, the Value-Added Tax (VAT) had an average statutory rate of 11.6%²⁵, and it exhibited a sustained increase (with some exceptions over time) to reach a current average value of 15.3%. While reforms in this tax parameter have generally shown an upward bias, there is no observable trend towards convergence in terms of the applied tax rates across these countries²⁶.

²⁵ We refer to the average of the general VAT rates applied in each country in each year. In this visualization, particular rates, reduced rates, increased rates, etc., were not considered.

²⁶ This statement is supported by the analysis of the range of the interquartile range of the tax rate series of the countries. While in 1990 the central 50% of the tax rate distribution was 6 points (7.0:13.0), in 2018 the central 50% of the distribution was 5 points (13.0:18.0).

In the domain of Corporate Income Tax (CIT), an examination of the trajectory of the average statutory rate reveals a reduction from a mean value of 34.8 in 1990 to a present average of 27.8. Despite the decline in the average rate, a thorough analysis of the data implies the presence of reforms in this tax regime that took into account regional contextual nuances, manifesting in a more pronounced convergence in tax burdens²⁷.

It is imperative to consider that the inherent automatic border adjustment feature present in nearly all Value-Added Tax (VAT) frameworks serves to mitigate distortions arising from the tax in the competitive landscape between domestically produced and imported goods. Consequently, jurisdictions within the region may possess greater latitude in determining the VAT rate, without necessitating a direct consideration of the geographical context or the origin/destination of traded products. In contrast, Corporate Income Tax (CIT) assumes a role of either attracting or dissuading investments, making it a critical determinant—alongside other parameters—predominantly assessed for its potential impact on investment decisions, with due regard to the specific regional context.

Finally, it is noteworthy that despite our focus on a group of countries situated within a shared geographical region, the data reveal substantial variations in their revenue-generation capabilities (refer to Figure 1). The tax burden experienced by the top three countries, characterized by the highest revenue levels, surpasses that of the bottom trio by a factor of 2.4. In the context of the taxes under examination, the data elucidate that countries with a diminished tax burden tend to exhibit a heightened reliance on Value-Added Tax (VAT) and Corporate Income Tax (CIT). With the exceptions of Panama and Mexico, among the nine countries with the least tax burden (comprising the lower echelon), VAT and CIT collectively constitute over 50% of the total tax burden. In contrast, among the nine countries grappling with the highest tax burdens, barring Nicaragua, the combined influence of these two taxes falls below the 50% threshold of the overall tax burden. These distinctive proportions, coupled with disparate revenue-generation capacities, signify that nations characterized by higher tax burdens maintain a more diversified revenue base when juxtaposed with their lower-revenue counterparts, which exhibit a pronounced reliance on VAT and CIT.

²⁷ In the case of the CIT, the 1990 interquartile range (32.0: 40.0) had an extension of 8 points, while that range was reduced to 4.5 points in 2021 (25.0: 29.5).

4 The Gap between Theoretical Collections and Effective Collections

As evidenced in the preceding sections (refer to Figure 1 and Figure 2), the fiscal capacity of the scrutinized countries, gauged by the trajectory of the tax burden, has demonstrated a discernible upward trend, primarily propelled by the pivotal roles played by the two taxes under investigation—Value-Added Tax (VAT) and Corporate Income Tax (CIT).

This segment of the investigation is dedicated to the computation of theoretical revenue projections for each of these taxes, predicated on specific macroeconomic aggregates. Subsequently, we will gauge the actual revenue's weight in relation to the theoretically projected revenue, a metric denoted as revenue collection efficiency. The economic disparity in tax performance, articulated as the variance between theoretical and actual revenue, will be delineated, and efforts will be directed towards elucidating the segment of this disparity attributed to exceptions within the tax framework. The Tax Expenditure Database of CIAT (TEDLAC) will be employed as a foundational resource for this purpose).

Concluding this analytical trajectory, our endeavor will involve estimating the proportion of potential revenue, encompassing factors such as tax non-compliance, among others. A nuanced understanding of actual revenue and tax expenditures will facilitate the identification of unexplained potential revenue, thus shedding light on the compliance gap.

It is imperative to acknowledge that this estimation of potential revenue is contingent upon an adaptation of macroeconomic aggregates, recognized as optimal explanatory factors for the taxable base of each tax under scrutiny. The inherent limitations of this indicator have been elaborated upon in the preceding section.

4.1. Estimation of the Theoretical VAT Collection, the Collection Gap and disaggregation of its components

Value-Added Taxes, or general sales taxes on goods and services, particularly those being analyzed for this group of countries, typically take the form of taxes imposed on the circulation of goods and services at all stages of production and marketing, up to the final stage, excluding exports of goods and services. While companies selling these goods and services are formally designated as taxpayers, in practice, the tax is transferable forward. It is an indirect tax whose ultimate impacted subject is the final consumer or, more generally, any buyer who is not entitled to input tax credit (final consumers, non-profit institutions, and the central government).

Given this characteristic and the available statistical data from the countries²⁸, we will turn to certain items in the Income and Expenditure Account of the National Accounts System of each country as an approximation to the final taxable base. The Income and Expenditure Account shows how households, government units, and non-profit institutions serving households (NPISH) distribute their disposable income between final consumption and savings (UN 2008).

The final consumption expenditure of households involves the spending by resident households on goods or services for consumption. This includes, among other things, the direct purchase of goods and services and those produced and consumed within the same household.

The Income and Expenditure Account also includes government spending on goods or services, whether individual or collective, as well as spending by NPISH.

²⁸ The macroeconomic statistics used for the estimation of the potential tax come from countries' Systems of National Accounts, or from statistics available from UNdata, a United Nations database service that provides official country data and statistics, or from statistics available from DataBank, a World Bank analysis and visualization tool that contains collections of time series data on a variety of topics.

As expressed in the Manual of the National Accounts System, the value of the general government's actual final consumption is equal to the value of its total final consumption expenditure minus its spending on individual goods or services supplied to households as social transfers in kind. The value of the actual final consumption of government units is therefore equal to the value of the expenses they incur in providing collective services or certain individual goods or services. A similar criterion must be adopted to account for the consumption of NPISH. The value of the actual final consumption of NPISH should be equal to the value of their total expenditure on final consumption minus their spending on individual goods or services supplied to households as social transfers in kind.

This approach to the theoretical taxable base we will construct will be determined by the sum of the three factors mentioned above, from which we will subtract the actual tax collection, to the extent that the valuation rules of these accounts indicate that spending is accounted for by the total consideration paid or valued, which includes, among other things, the sales tax or VAT.

Using this approach, we estimate the theoretical revenue of the VAT by applying the general legal rate of the tax to that amount. As we know, the VAT is a tax that applies to the general circulation of goods and services, with a standard legal rate and a set of exceptions: exempted goods and services or goods taxed at the minimum rate. The theoretical revenue will thus seek to demonstrate the revenue potential of a tax that applies a uniform rate to all goods and services without exceptions.

Table 2: Estimation of Potential Collection, Tax Gap and Components. VAT

Ord	Variable	Source
(a)	(+) Household Final Consumption	System of National Accounts of the Country & The World Bank Data (https://data.worldbank.org/indicator/) & UNdata (https://data.un.org/)
(b)	(+) Government consumption and NPISH	System of National Accounts of the Country & The World Bank Data (https://data.worldbank.org/indicator/) & UNdata (https://data.un.org/)
(c)	(-) Effective VAT collection	IDB-CIAT Collection Database (https://www.ciat.org/base-de-datos-de-recaudacion-bid-ciat/) & Collection Reports countries
(d)	(=) Final Consumption excluding VAT	Estimation
(e)	(*) Legal Tax Rate	Tax Rates History - CIAT (https://www.ciat.org/aliquotas-en-america-latina/) & Country Legislation
(f)	{(d)*(e)} (=) Potential VAT Collection	Estimación
(g)	(-) Effective VAT collection	IDB-CIAT Collection Database (https://www.ciat.org/base-de-datos-de-recaudacion-bid-ciat/) & Collection Reports countries.
(h)	{(f) – (g)} (=) VAT Tax Gap	Estimation
(i)	{(g)/(f)} (=) VAT Revenue Collection Efficiency	Estimation
(j)	{1-(i)} (=) {h/(f)} (=) VAT Revenue Collection Inefficiency	Estimation
(k)	(+)VAT Tax Expenditures	Tax Expenditure Data Basedel CIAT (https://www.ciat.org/gastos-tributarios/) & Tax Expenditures Reports countries.
(l)	{(k)/(f)} (=) Inefficiency_gt	Estimation
(m)	{1 - (i) - (l)} (=) Inefficiency_x	Estimation

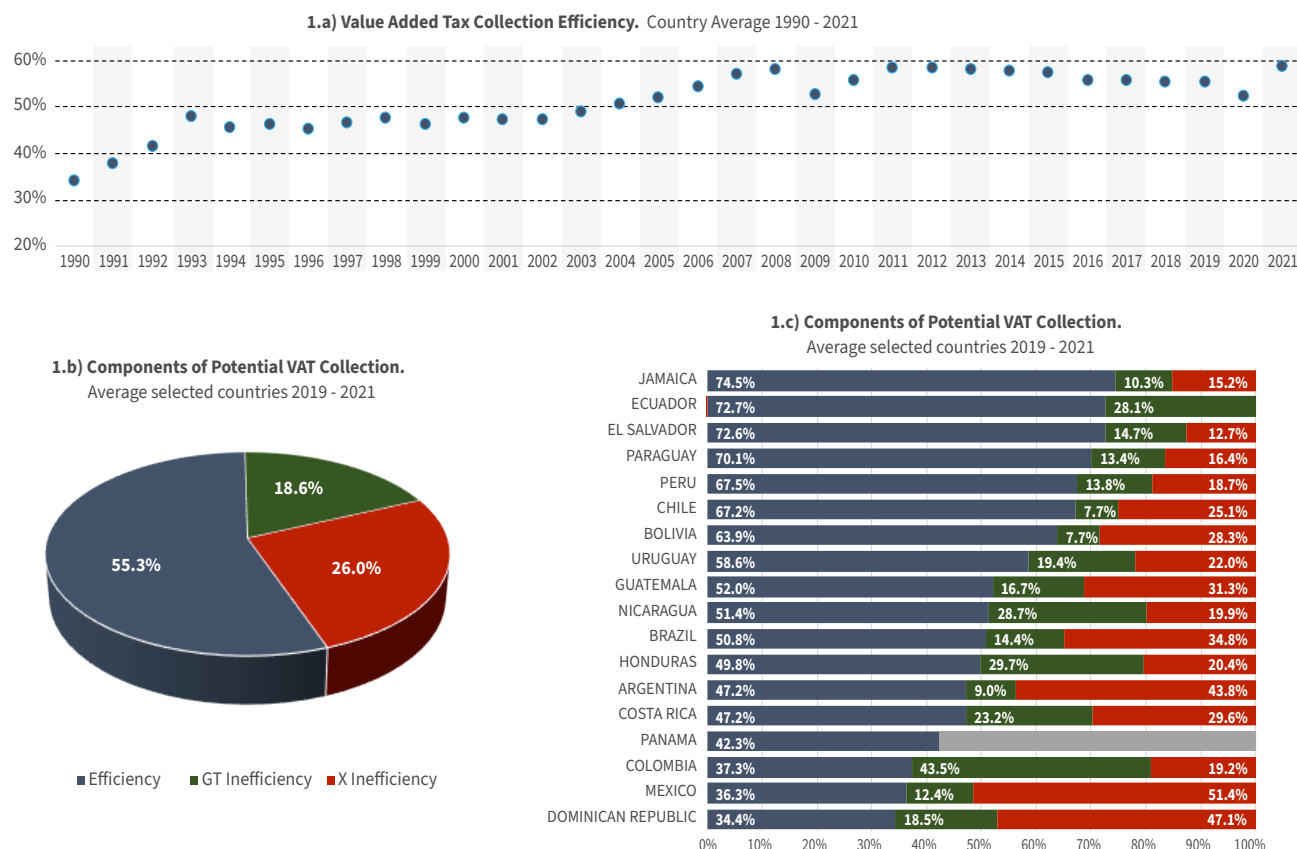
The existing exceptions in this tax are assessed in tax expenditure studies, so a portion of the found tax gap will be attributable to the existence of these exceptions.

Once the theoretical collection is obtained, contrasting the effective collection with the theoretical one will show us the revenue *collection efficiency of the tax*. With the available data, we can build a long series of revenue collection efficiency and infer whether the observed improvement in tax collection is attributable solely to nominal upward changes in rates (as seen in the graph) or also to an improvement in revenue collection efficiency. As shown in its calculation, but not necessarily its origin, tax efficiency is independent of the level of the legal rate.

If the effective collection were to reach the same magnitude as the theoretical collection, we would be dealing with a tax that collects its entire potential, a theoretical scenario in which there would be no policy gap (tax expenditures) or compliance gap (evasion). Empirical evidence will show us that revenue collection efficiency is less than 1, given that the effective collection is less than the potential collection. We will determine the overall gap as the difference between 1 and the ratio of effective collection to theoretical collection.

With the value of the gap and based on the amounts of VAT tax expenditures reported by the countries, we are able to estimate the portion of the economic gap attributable to this concept. The policy gap.

Figure 4: VAT Revenue Collection Efficiency 1990 – 2021 (1.a)
Components of Potential Collection 2019 – 2021 (1.b; 1.c)



Note: In the case of Panama, given the methodology employed in calculating tax expenditure (which yields a G inefficiency exceeding the total inefficiency), we are unable to disaggregate between G inefficiency and X inefficiency.

Finally, the remainder between unity, revenue collection efficiency and the portion of inefficiency attributable to tax expenditures will determine the portion of inefficiency not attributable to policy, which to some extent is explained by tax noncompliance. We must keep in mind that, from the initial estimation, when we choose the most representative variables of the tax base, we are approximating the potential collection, both the collection efficiency and the difference attributable to non-compliance are estimates, so this result does not necessarily show the VAT evasion rate. In any case, to the extent that the macroeconomic variables considered have systematically applied accounting criteria, and since we have a long series, we will be able to appreciate the trend of the indicator as a better measure to evaluate whether the tax collection efficiency has increased, or whether the trajectory of the other components of the tax gap has been the same.

The figure above summarizes the results achieved.

In Figure 1.a, the average VAT collection efficiency spanning the temporal domain of 1990 to 2021 is presented. This metric was computed as the yearly mean of the collection efficiency observed in individual countries. The protracted nature of the dataset enables a discernment of the consistent enhancement witnessed by this indicator over the specified timeframe. Commencing with values below 0.4 at the inception of the series, the discernible augmentation in the ratio between effective collection and theoretical collection has progressed steadily, culminating in an initial zenith in the year 2007.

Starting in 2007, the indicator immediately shows a drop, and then some stability (with a downward bias), a new sharp drop in 2020, and immediately after that, it passes to the maximum observed level (2021 = .584). The drop observed in 2020 is consistent with the steep fall in Equivalent Fiscal Pressure shown above and analyzed in detail in the CIAT Equivalent Fiscal Pressure paper (2023)²⁹. Different mechanisms of extensions and tax benefits introduced in this tax by the countries, in response to the pandemic, had a rapid effect on the collection of this tax, which, due to the way it is determined, reacts immediately to changes in the parameters of the tax.

This outcome elucidates the pivotal role played by this tax in revenue generation and elucidates its contribution to the persistent expansion of the tax burden throughout the scrutinized period. Not only did the capacity for tax collection increase, as evidenced by the escalation in statutory rates (refer to Figure 3), but the efficiency of collection did not mitigate this impact; rather, it augmented it. Enhancements in collection efficiency amid a backdrop of heightened collection capacity of the instrument have yielded improvements in overall collection levels.

Figure 1.b statically illustrates the theoretical composition of VAT revenue calculated as the average of the theoretical revenue composition of the countries included in the analysis. The period considered is the last available triennium, and therein we can observe, in addition to the estimated collection efficiency of 0.553, that the tax gap is divided into a portion equivalent to 0.186 attributable to policy gap and 0.260 to compliance gap.

²⁹ Morán, Dalmiro; Solera, Marco. Equivalent Fiscal Pressure in Latin America and the Caribbean (1990-2021) : Update and current situation in the aftermath of the COVID-19 pandemic. CIAT (2023)

Sub-figure (1.c) shows statically the composition of the theoretical VAT collection at country level.

Table 3: Components of Potential VAT Collection. Selected countries 2019 - 2021

Country	Efficiency	GT Inefficiency	X Inefficiency
Argentina	0.47	0.09	0.44
Bolivia	0.64	0.08	0.28
Brasil	0.51	0.14	0.35
Chile	0.67	0.08	0.25
Colombia	0.37	0.43	0.19
Costa Rica	0.47	0.23	0.30
Dominican Republic	0.34	0.19	0.47
Ecuador	0.73	0.28	-0.01
El Salvador	0.73	0.15	0.13
Guatemala	0.52	0.17	0.31
Honduras	0.50	0.30	0.20
Jamaica	0.74	0.10	0.15
Mexico	0.36	0.12	0.51
Nicaragua	0.51	0.29	0.20
Panama*	0.42		
Paraguay	0.70	0.13	0.16
Peru	0.67	0.14	0.19
Uruguay	0.59	0.19	0.22
Average	0.55	0.19	0.26

Note: *In the case of Panama, given the methodology employed in calculating tax expenditure (which yields a G inefficiency exceeding the total inefficiency), we are unable to disaggregate between G inefficiency and X inefficiency.

The collection efficiency ratio at the country level ranges between 0.34 and 0.74, with an average of 0.55.

As mentioned in this document, collection *inefficiency* can be broken down into two main components: on the one hand, non-collection due to the existence of exceptions to the general taxation rule, and on the other hand, non-collection attributable to non-compliance, among other factors. The first of these components is estimated using tax expenditure reports, while the second is determined by the difference between the theoretical level of efficiency (1), minus the sum of the two components determined above.

While the average inefficiency attributed to each factor is 0.186 for tax expenditures and 0.260 for non-compliance, upon analyzing the data, we can observe that there is a greater dispersion in the country-level results for these factors compared to those observed for efficiency³⁰. This disparity can be attributed, in part, to variations in the magnitude of tax expenditures across countries, as well as divergent methodological approaches employed by nations in the acknowledgment and estimation of such expenditures. Concerning non-compliance inefficiency, characterized as a residual estimate, its outcome is contingent upon the levels of collection efficiency and tax expenditures.

In Appendix IV of this document, a comparative examination is conducted between the collection efficiency and the estimated ratios for OECD countries during the identical period³¹. This analytical approach facilitates an appreciation of the observation that, with regard to this particular indicator, both groups of nations are attaining comparable levels of collection efficiency utilizing the same fiscal instrument.

It is imperative to acknowledge that the estimation of the theoretical tax base, derived from the amalgamation of selected macroeconomic variables, represents an approximation rather than a comprehensive depiction of the actual tax base. Consequently, the identified X-inefficiency, discerned as a residual value subsequent to deducting effective collection and tax expenditures from the potential collection, comprises two primary components. The first component pertains to the discordance between the estimated tax base and the genuine tax base, while the second component embodies effective inefficiency, the latter being, to some extent, attributable to instances of tax non-compliance or evasion. In instances where the National Accounts adhere to a systematic and consistent methodology in formulating and updating estimates, alterations in the value of the indicator or the trajectory of this index across the series may serve as a potential indicator of fluctuations in levels of non-compliance.

³⁰ The total efficiency rank is 0.40, inefficiency attributable to GT is 0.43 and inefficiency attributable to non-compliance is 0.58.

³¹ Consumption Tax Trends 2020: VAT/GST and Excise Rates, Trends and Policy Issues. 2021.

4.2. Estimation of the Theoretical CIT Collection, the Collection Gap and disaggregation of its components

Taxes on corporate income, business income, or profits of companies, which we generically refer to as Corporate Income Tax (CIT), generally arise from the application of a proportional tax rate to the economic results (accounting profits) of companies. These accounting profits undergo specific fiscal adjustments, thereby determining the taxable base, also known in this tax context as fiscal income. Simultaneously, simplified tax regimes often coexist with this tax. Acknowledging the increased complexity in determining the taxable base, which necessitates the presence of comprehensive accounting records, these simplified regimes typically rely on only select activity variables for the determination of *fiscal gain* or the tax itself.

In light of this methodology, the foundational approach to computation, and the accessible statistical dataset encompassing various countries, we will employ specific elements from the Generation of Income Account. This account delineates the segment of value added allocated to capital. Positioned as a sub-account within the framework of the Primary Income Distribution Account (UN - 2008), the Generation of Income Account serves to apportion value added among labor (comprising remunerations), capital, and government (involving taxes less subsidies). The segment attributable to capital manifests itself in the equilibrium of this account, denoted as the Operating Surplus or Mixed Income.

The accounting balance of the generation of income account, the portion of value added distributed to capital, is the result of deducting from Gross Value Added the remuneration of employees and taxes less subsidies on production. This balance measures the surplus or deficit generated from production.

The financial equilibrium denominated as the Operating Surplus, or alternatively, mixed income in the context of proprietorships owned by households wherein the proprietor contributes labor, presents a challenge in distinguishing remuneration from entrepreneurial performance. Conceptually, the balance within the income generation account deviates from the consolidation of enterprise accounting outcomes, primarily due to the prevalent expression of the former in national accounts in gross terms. This expression neglects considerations for the consumption of fixed capital or the acknowledgment of financial services received or provided.

The consumption of fixed capital denotes the reduction, within the accounting timeframe, in the present value of the inventory of fixed assets possessed and utilized by a producer, stemming from both physical deterioration and standard obsolescence. From an accounting perspective, the synonymous terms for this phenomenon are depreciation or amortization of fixed assets. On the other hand, the term “consideration for financial services” pertains to the remuneration owed for financial assets or natural resources procured or leased by the enterprise, encompassing any interest, rent, or analogous income receivable on financial assets or natural resources owned by the company, as delineated by the United Nations (UN – 2008).

Most of the statistics available for this estimation present the balances of the generation of income accounts in gross terms. As a way of approximating the net accounting result of the companies, we deduct from this balance an estimate of the consumption of fixed capital. It is linked to the Gross Fixed Capital Formation account, in the Use of Income Account. Gross fixed capital formation comprises acquisitions of new and existing fixed assets through purchase, barter, or own-account capital formation, minus the disposal of existing assets through sale or barter (UN 2008).

Table 4: Estimation of Potential Collection, Tax Gap, and Components. CIT

Ord	Variable	Source
(a)	(+) Gross Operating Surplus	System of National Accounts of the Country & The World Bank Data (https://data.worldbank.org/indicator/) & UNdata (https://data.un.org/)
(b)	(+) Gross Mixed Income	System of National Accounts of the Country & The World Bank Data (https://data.worldbank.org/indicator/) & UNdata (https://data.un.org/)
(c)	(-) Consumption of Fixed Capital	System of National Accounts of the Country & The World Bank Data (https://data.worldbank.org/indicator/) & UNdata (https://data.un.org/). Cuenta de Referencia, CKF (t-1)
(d)	(=) Net income of companies	Estimation
(e)	(*) <i>Legal tax rate</i>	Tax Rates History - CIAT (https://www.ciat.org/alicuotas-en-america-latina/) & Country Legislation
(f)	(=) Potential CIT Collection	Estimation

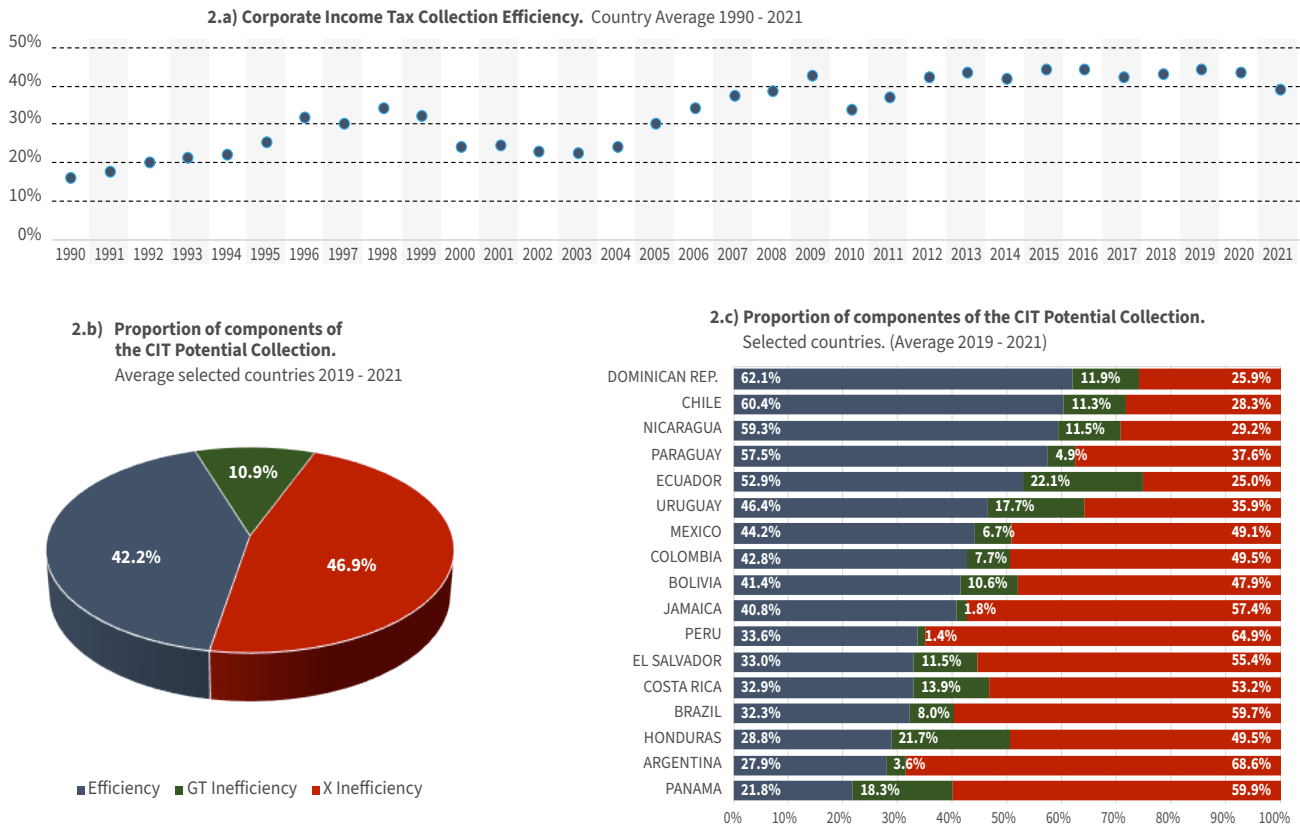
Ord	Variable	Source
(g)	(-) Effective CIT collection	IDB-CIAT Collection Database (https://www.ciat.org/base-de-datos-de-recaudacion-bid-ciat/) & Collection Reports countries
(h)	(=) CIT Tax Gap	Estimation
(i)	$\{(g)/(f)\}$ (=) CIT Revenue Collection Efficiency	Estimation
(j)	$\{1-(i) - (h)/(f)\}$ (=) CIT Revenue Collection Inefficiency	Estimation
(k)	(+) CIT Tax Expenditures	Tax Expenditure Data Based - CIAT (https://www.ciat.org/gastos-tributarios/) & Tax Expenditures Reports - Countries
(l)	$\{(k)/(f)\}$ (=) Inefficiency_gt CIT	Estimation
(m)	$\{1 - (i) - (l)\}$ (=) Inefficiency_x CIT	Estimation

The macroeconomic statistics employed in the estimation of the theoretical tax emanate either from the National Accounts Systems of individual countries or from the statistics accessible through UNdata, a United Nations database service providing official data and statistics from various countries. Additionally, data is sourced from statistics available on DataBank, a World Bank tool for analysis and visualization containing sets of data series spanning diverse thematic areas.

The estimate of the theoretical tax base will then be the sum of the balances of the generation of income account, less an estimate of the consumption of fixed capital. The potential tax is estimated for each country and each fiscal year as the application of the current tax rate on the base thus estimated.

The existing exceptions within the Corporate Income Tax (CIT) are duly assessed in studies on tax expenditures, and consequently, a portion of the identified tax gap may be ascribed to the presence of these exceptions. Subsequent to the derivation of the theoretical revenue, the comparison between actual and theoretical revenue unveils the *revenue collection efficiency*. Utilizing the available information, a protracted series of tax collection efficiency can be constructed, enabling an inference as to whether the observed enhancements in tax revenue are attributable to an amelioration in the revenue collection efficiency.

Figure 5: Revenue Collection Efficiency of CIT 1990 - 2021 (2.a)
Components of Potential Collection 2019 – 2021 (2.b; 2.c)



The figure above summarizes the results found.

In Figure 2.a, the average efficiency of revenue collection for the Corporate Income Tax (CIT) during the period spanning 1990 to 2021 is presented. This metric is computed as the yearly mean of the collection efficiency observed in each country for each corresponding year.

The longitudinal analysis allows for a nuanced understanding of the trajectory of this indicator over time, characterized by fluctuations. Commencing with values in the vicinity of 0.2 at the inception of the series, the ratio denoting the efficacy of actual collection relative to theoretical collection has demonstrated sustained advancements, with the exception of the years 2000, 2010, and 2021, culminating in a zenith in 2019 (albeit remaining below 0.5).

The results for the most recent periods are consistent with the tax pressure series shown above as well as with the detailed analysis included in Equivalent Fiscal Pressure in Latin America (CIAT-2023)³². Because of the way this tax is determined, linked to the results of the previous fiscal year, the changes that could have been introduced in response to the context of the pandemic (in 2020 and 2021), may not have had an immediate impact as that observed in the VAT. The reading of the tax burden series shows that although this tax recovered in 2021, after the fall in 2020, it was lower than the recovery of the total tax burden, or that of the VAT itself, which explains the different trends between both indicators.

Although the value of this efficiency indicator throughout the series is lower than the VAT efficiency indicator (Figure 1.a), the CIT indicator has shown a higher growth rate than the VAT efficiency indicator, more than doubling its value from the beginning to the end of the series. In the following section we will analyze the relationship between the two indicators in more detail.

The evolution of the revenue collection efficiency of this tax explains the greater presence that the tax has shown in the long-term tax burden (Figure 2).

The subfigure (2.b) presents a static illustration of the theoretical revenue composition of the Corporate Income Tax (CIT). This computation is derived as the mean of the theoretical revenue composition across the countries encompassed in the analysis. The temporal scope considered pertains to the most recent available three-year period. Within this period, the estimated collection efficiency stands at 0.422. Furthermore, the tax gap comprises a segment of 0.109 attributed to the policy gap and 0.469 to X-inefficiency, encompassing the non-compliance gap.

Conversely, subfigure (3.a) provides a static representation of the theoretical CIT collection composition at the national level. This corresponds to the average outcome of the data series over the last three years.

³² Morán, Dalmiro; Solera, Marco. Equivalent Fiscal Pressure in Latin America and the Caribbean (1990-2021): Update and current situation in the aftermath of the COVID-19 pandemic. CIAT (2023).

Table 5: **Components of Potential Collection CIT**
Selected countries 2019 - 2021

Country	Efficiency	GT Inefficiency	X Inefficiency
Argentina	0.28	0.04	0.69
Bolivia	0.41	0.11	0.48
Brazil	0.32	0.08	0.60
Chile	0.60	0.11	0.28
Colombia	0.43	0.08	0.49
Costa Rica	0.33	0.14	0.53
Ecuador	0.53	0.22	0.25
El Salvador	0.33	0.12	0.55
Honduras	0.29	0.22	0.50
Jamaica	0.41	0.02	0.57
Mexico	0.44	0.07	0.49
Nicaragua	0.59	0.12	0.29
Panama	0.22	0.18	0.60
Paraguay	0.58	0.05	0.38
Peru	0.34	0.01	0.65
Dominica Republic	0.62	0.12	0.26
Uruguay	0.46	0.18	0.36
Average	0.42	0.11	0.47

Note: In the case of Guatemala, the unavailability of information regarding the necessary macroeconomic variables for estimation precluded the assessment of efficiency/inefficiency values for tax collection in this country.

The collection efficiency ratio at the country level ranges between 0.22 and 0.62, with an average of 0.42.

As elucidated in this document, the revenue collection inefficiency can be deconstructed into two principal components. Firstly, there is non-collection stemming from exceptions to the overarching taxation norm, and secondly, non-collection attributable to non-compliance, among various other factors. The estimation of the first component is derived from tax expenditure reports, while the second is ascertained by computing the difference between the theoretical level of efficiency (1) and the aggregate of the two components delineated earlier.

We can see that although the average inefficiency attributable to one or the other factor is 0.11 and 0.47 for tax expenditures and non-compliance, respectively, when analyzing the data we can see that there is a greater dispersion in the results at the country level than those observed for efficiency³³. To some extent, this is attributable to different levels of tax expenditures, but also to different methodological criteria applied by countries to recognize and estimate them. On the non-compliance inefficiency side, being a residual estimate, its result is dependent on the levels of collection efficiency and tax expenditures.

It is imperative to bear in mind that the estimation of the theoretical tax base, achieved through the amalgamation of selected macroeconomic variables, does not comprehensively capture the entirety of the tax base but rather approximates it. Consequently, the X-inefficiency, discerned as a residual value subsequent to deducting effective tax collection and tax expenditures from the potential collection, comprises two primary components. The first involves a disparity between the estimated tax base and the authentic tax base, while the second entails effective inefficiency, to some extent traceable to tax noncompliance or evasion.

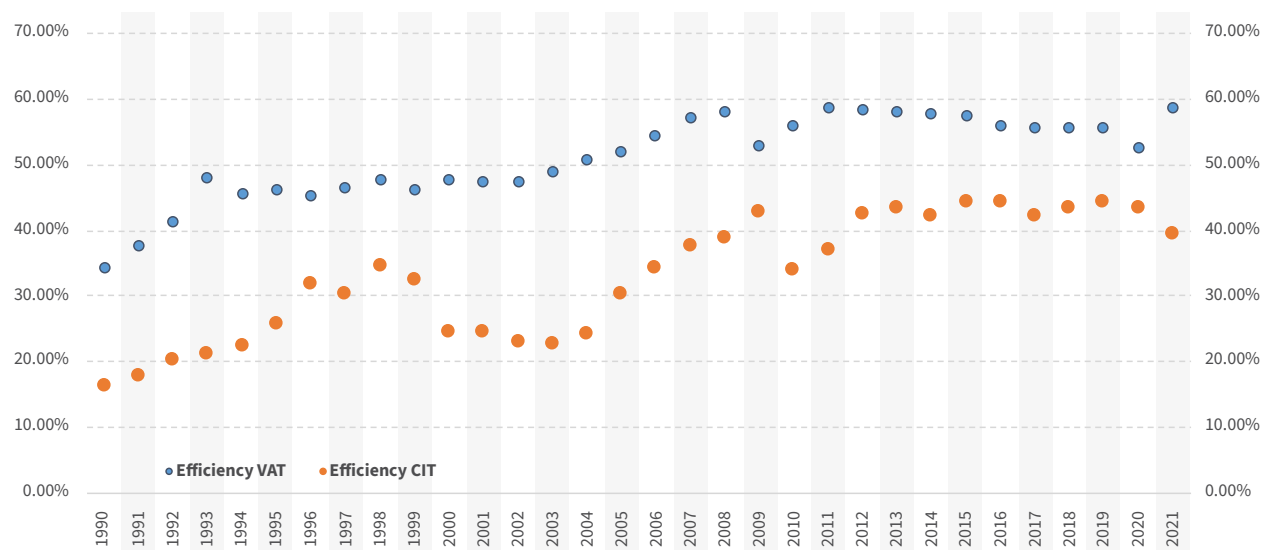
Simultaneously, Corporate Income Taxes (CITs) commonly encompass specific tax adjustments that introduce variations between the accounting outcome and the tax outcome for the given fiscal year, which may not necessarily be incorporated within the tax expense result. Certain legitimate expenses are disallowed for tax purposes, and some statutory deductions, such as the adjustment of losses from preceding years, do not qualify as tax expenses. Provided that the National Accounts adhere to a systematic and consistent methodology in the formulation and updating of its estimates, alterations in the indicator's value or the trajectory of this index over the series may serve as an indicative measure of changes in the levels of non-compliance.

³³ The coefficient of variation ($CV = \text{standard deviation} / \text{mean}$) is 0.25 for the efficiency ratio, 0.61 for inefficiency attributable to tax expenditures and 0.32 for residual inefficiency, attributable to non-compliance.

5 Revenue Collection Efficiency and Tax Burden

Upon juxtaposing the outcomes of VAT and CIT revenue collection efficiency during the scrutinized period, discernible evidence of congruent trends in both series emerges. Importantly, notwithstanding the harmonization and coordination efforts within national accounts, as well as the shared foundation for estimating theoretical collection, the determination of collection efficiency for each tax was conducted independently and employed distinct sets of variables. Consequently, the observed similarity in the trajectory of the series could be ascribed to the endogeneity inherent in the tax bases of both taxes. Notably, enhancements in revenue reporting, coupled with a reduction in income under-declaration, manifest as augmented collection efficiency in both VAT and CIT.

Figure 6: VAT & CIT revenue collection efficiency
1990 - 2021



Over the entire temporal span under consideration, it is evident that the VAT revenue collection efficiency consistently surpasses the CIT indicator. The discrepancy between the two narrows towards the conclusion of the series, with the exception of the final observation. In this instance, an ascent in the VAT indicator coincides with a decline in the CIT indicator.

In the initial sections of this document, we highlighted a common factor in both figures, specifically tied to the taxable base or, more precisely, the methodology employed in ascertaining the taxable base. Both taxes exhibit a partial overlap in their tax bases. The VAT tax base is computed as the disparity between taxed inputs and taxed outputs, subject to specific rules of determination. Similarly, the CIT tax base is derived from the variance between inputs and the aggregate of total outputs, again guided by specific rules of determination.

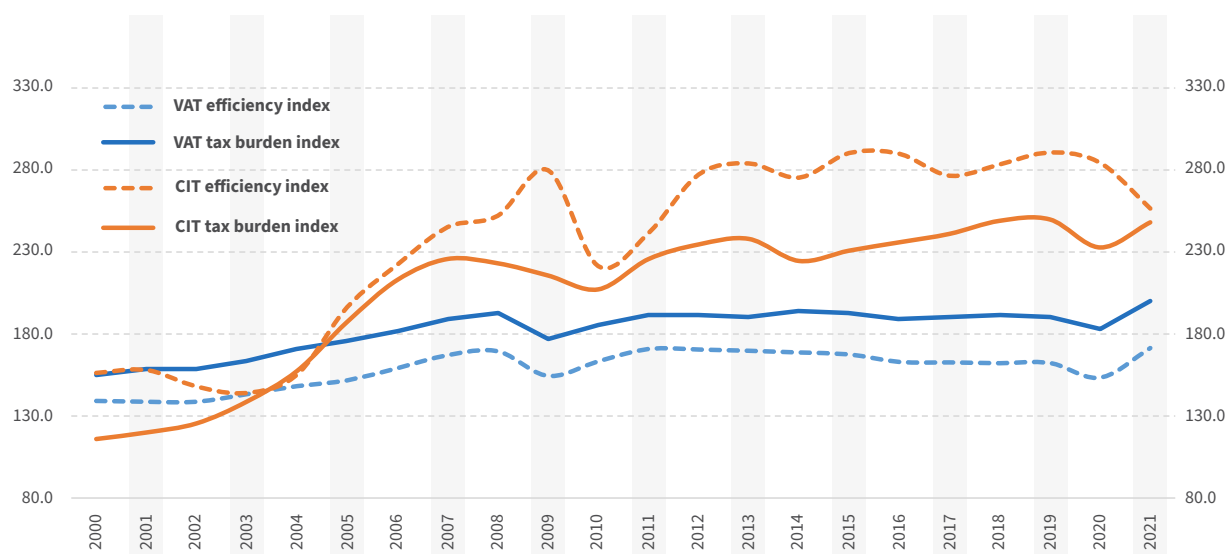
The substantial congruence in the structure and computation of the tax base for both taxes establishes a correlation such that alterations in either inputs or outputs concurrently influence both tax bases. For instance, a decline in business turnover during a fiscal year exerts a downward influence on the taxable base of both VAT and CIT, leading to their reduction. Conversely, an escalation in turnover, even when accompanied by an expansion in outputs, is likely to result in an augmentation of the nominal tax base for both taxes, consequently elevating tax revenue.

The VAT taxable base exhibits a higher proportion relative to revenues or turnover in comparison to the CIT taxable base. Consequently, the CIT taxable base is more susceptible to fluctuations in turnover, particularly instances of under- or over-billing. Indeed, despite the efficiencies drawing closer towards the conclusion of the series (excluding the final observation), the CIT X-Inefficiency component surpasses the VAT X-Inefficiency component, as depicted in *Sub-figures 1-(a) and 2-(a)*.

As previously demonstrated, the tax burden within the scope of countries under analysis has demonstrated an upward trajectory over the scrutinized period. Concurrently, we have underscored that the progression of tax collection associated with the taxes under consideration significantly elucidates the dynamics of this principal indicator. Additionally, we have observed that reforms enacted in these countries have led to an elevation in the standard VAT rate. In contrast, within the CIT framework, changes have indicated a tendency toward rate convergence, thereby contributing to a reduction in the average statutory tax rate across the countries.

To juxtapose the impact of revenue collection efficiency on the trajectory of the tax burden for each tax, we formulated indices with the base year set at 1990=100 for both the efficiency indicators and the tax burden indicators.

Figure 7: VAT and CIT revenue collection efficiency index & Tax burden index ³⁴
1990 - 2021 (base 1990 = 100)



The depicted figure serves as a valuable tool for comparing pairs of variables. Specifically, it juxtaposes the VAT efficiency index (represented by the dotted blue line) with the VAT tax burden index (depicted by the solid blue line). Concurrently, it provides a visual representation of the CIT efficiency index (illustrated by the dotted orange line) alongside the CIT tax burden index (depicted by the solid orange line).

Anticipatedly, each pair of indices exhibits a similar³⁵ trajectory, but the positioning of each indicator within the respective pairs conveys meaningful information. Notably, the VAT tax burden index consistently manifests a trajectory surpassing that of the tax efficiency index, while a converse trend is observed in the case of the CIT, where collection efficiency outperforms the tax burden index (except in the final observation where they converge). This phenomenon may be partially ascribed to the ensuing reforms, particularly at the rate level. In the VAT context, despite a priori expectations that rate alterations would enhance its collection capacity, the efficiency did not correspondingly keep pace. Conversely, in the CIT domain, characterized by prevalent rate reductions, the tax exhibited an improvement in collection efficiency, potentially yielding additional collection gains compared to scenarios where efficiency remained at pre-reform levels.

³⁴ Appendix VI shows the point values of each of the index series expressed in the figure.

³⁵ Tax burden being the effective tax collection over GDP, and collection efficiency the ratio of effective tax collection over theoretical tax collection, both indicators share the same numerator.

F inal Considerations

In the preceding section, we expound upon the outcomes derived from an approximation of the assessment of VAT and CIT tax differentials within the nations of the region. This approximation is rooted in estimations of the theoretical yield of each tax and the efficacy of tax collection. The methodology incorporates data sourced from the System of National Accounts, national accounts statistics provided by international organizations, tax collection series, fundamental parameters associated with the taxes in question, and findings gleaned from extant studies pertaining to tax expenditures.

The findings acquired suggest a progressive augmentation in the efficacy of tax collection for both VAT and CIT over the examined temporal span. This improvement is primarily attributed to noteworthy reductions in instances of tax non-compliance. Despite the fact that the collection efficiency of CIT lags behind that of VAT, an intriguing observation emerges: the former exhibits superior performance in ameliorating the tax gap when compared to the latter. Specifically, while the VAT gap remains constant in the most recent period, the CIT collection endeavors manifest a more pronounced narrowing of the gap.

Nevertheless, opportunities for remedial actions persist, with inefficiency levels registering at 0.447 and 0.578 for the VAT and CIT respectively. Concurrently, while inefficiency in the VAT is apportioned relatively evenly between the policy gap (attributable to tax expenditures) and evasion-induced inefficiency, the CIT demonstrates a prevalence of the latter, coupled with a diminished presence of policy-related inefficiency. It is imperative to underscore that within the CIT framework, certain exemptions to the tax base exist, leading to a divergence from the genuine base (namely, business profits). These exemptions, not classified as tax expenditures, impact the outcome of the non-compliance gap.

We point out some of the limitations of this approach to the tax gap.

Since this is an indirect method, it is based on an estimate of the tax base of each tax using the most appropriate set of available macroeconomic statistics.

The set of statistics does not necessarily fully reflect the tax base.

Certain statistical data were sourced from the individual presentations of the respective countries, while others were extracted from databases curated by international organizations responsible for compilation and reporting. In instances where data points were absent, a linear interpolation method was employed, thereby preserving the historical technical interdependencies.

Macroeconomic statistics are disclosed on an accrual basis, with collection series exhibiting a temporal lag relative to this accrual. The lag, moreover, tends to vary depending on whether VAT or PIT is under consideration. This temporal misalignment can introduce a postponement in the progression of the computed index. Notably, this phenomenon becomes evident in the fiscal years 2020 and 2021, during which countries implemented palliative tax measures, such as temporary exemptions and tax deferrals, aimed at supporting businesses and individuals amidst the challenges posed by the COVID-19 pandemic.

Longitudinal datasets pertaining to tax expenditures, particularly for the earlier periods encompassed by this estimation, are notably absent. In instances where data points were absent, recourse was made to linear interpolation, a method that preserves the historical technical associations within the dataset.

The study focused on evaluating the collection efficiency within the cohort of countries documented in the tax expenditure database. To broaden the temporal series, additional country reports were incorporated into the estimation.

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Appendix I.

Sources of information for each country

Argentina	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Collection Series	Administración Federal de Ingresos Públicos
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
Tax Expenditures Reports	Dirección Nacional de Investigaciones y Análisis Fiscal
National Accounts Series	INDEC, Dirección Nacional de Cuentas Nacionales.
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Bolivia	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Estadísticas Económicas - Instituto Nacional de Estadística.
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Brazil	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	https://www.confaz.fazenda.gov.br/boletim-de-arrecadacao-dos-tributos-estaduais
Collection Series	https://receita.economia.gov.br/dados/receitadata/arrecadacao/relatorios-do-resultado-da-arrecadacao
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Instituto Brasileiro de Geografia e Estatística
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Chile	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Banco Central Chile - Cuentas Nacionales de Chile 2013-2020
National Accounts Series	Banco Central Chile - Cuentas Nacionales de Chile 2018-2021
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Colombia	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
Tax Expenditures Reports	DIAN. Coordinación de Estudios Económicos - Gasto Tributario en el IVA e Impuesto sobre la Renta 2017 - 2018.
National Accounts Series	DANE - Departamento Administrativo Nacional de Estadística
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Costa Rica	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Banco Central de Costa Rica - Cuentas Nacionales Base 2017
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Ecuador	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Banco Central del Ecuador - Cuentas Nacionales
National Accounts Series	UN/ DATA + DATABANK
National Accounts Series	Instituto Nacional de Estadística y Censos
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

El Salvador	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Banco Central de Reserva - Sistema de Cuentas Nacionales
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Guatemala	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Banco de Guatemala - Cuentas Nacionales
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Honduras	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	Informe de Gasto Tributario - Secretaría de Finanzas
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Departamento de Estadísticas Macroeconómicas, BCH
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Jamaica	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Statistical Institute of Jamaica
Tax rate series	CIAT - DATA. Tax Rates in Latin America
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Mexico	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	National Institute of Statistics and Geography **** INCOMPLETE INFORMATION ONLY QUARTERS.
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Nicaragua	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Banco Central de Nicaragua - Series de CCNN 2006
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Panama	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
Tax Expenditures Reports	Estimación del Gasto Tributario del ITBMS de la República de Panamá. Marvín Cardoza
Tax Expenditures Reports	Estimación del Gasto Tributario del ISR de la República de Panamá. Marvín Cardoza
National Accounts Series	Instituto Nacional de Estadística y Censo Panamá - Princip serie 1996-2006 - SCN Panamá
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Paraguay	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) z America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Banco Central del Paraguay - Sistema_de_Cuentas_Nacionales_Paraguay_Serie_2008_2018
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Peru	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Instituto Nacional de Estadística e Informática - Cuentas Nacionales
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Dominican Republic	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Banco Central República Dominicana
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Uruguay	Sources of information
Collection Series	Equivalent Fiscal Pressure (EFP) in Latin America and the Caribbean - 1990-2021 - IDB/CIAT
Collection Series	Global Revenue Statistics Database - OCDE
Collection Series	Informes anuales de recaudación de la Dirección General Impositiva
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2018
Tax Expenditures Series	TEDLAC - Tax Expenditure Database CIAT 2023
National Accounts Series	Banco Central del Uruguay & Instituto Nacional de Estadística
National Accounts Series	UN/ DATA + DATABANK
Tax rate series	CIAT - DATA. Tax Rates in Latin America
Tax rate series	Statutory Corporate Income Tax Rates Database - OCDE
Tax rate series	Worldwide Corporate Tax Guide - 2022 EY - EYGM Limited
Tax rate series	Worldwide VAT, GST and Sales Tax Guide - 2023 EY - EYGM Limited

Appendix II.

VAT efficiency series 1990 - 2021 by country. CIAT

Country	ARG	BOL	BRA	CHI	COL	CRI	ECU	ELS	GUA	HON	JAM	MEX	NIC	PAN	PAR	PER	RDO	URU	AVERAGE
1990	0.22	0.38	0.56	0.56	0.32	0.54	sd	sd	0.37	sd	0.06	0.29	sd	0.35	sd	0.12	0.25	0.40	0.34
1991	0.26	0.39	0.45	0.62	0.31	0.48	sd	sd	0.37	sd	0.17	0.40	0.55	0.36	sd	0.24	0.23	0.42	0.38
1992	0.40	0.42	0.46	0.67	0.35	0.42	sd	sd	0.44	sd	0.31	0.31	0.59	0.43	sd	0.28	0.24	0.44	0.41
1993	0.48	0.51	0.42	0.71	0.31	0.42	0.35	0.46	0.47	sd	0.57	0.27	0.67	0.45	0.91	0.36	0.30	0.43	0.48
1994	0.48	0.60	0.51	0.69	0.38	0.46	0.34	0.50	0.44	sd	0.52	0.29	0.33	0.47	0.53	0.45	0.29	0.43	0.45
1995	0.45	0.59	0.51	0.66	0.36	0.50	0.35	0.56	0.49	sd	0.57	0.22	0.22	0.48	0.63	0.48	0.30	0.44	0.46
1996	0.44	0.59	0.50	0.70	0.36	0.57	0.34	0.50	0.45	sd	0.49	0.22	0.24	0.46	0.57	0.46	0.31	0.45	0.45
1997	0.45	0.64	0.48	0.68	0.36	0.42	0.37	0.52	0.51	sd	0.48	0.24	0.30	0.48	0.61	0.50	0.36	0.47	0.46
1998	0.44	0.64	0.47	0.67	0.34	0.49	0.41	0.53	0.52	sd	0.47	0.23	0.38	0.47	0.63	0.50	0.37	0.49	0.47
1999	0.42	0.58	0.48	0.65	0.32	0.48	0.36	0.52	0.57	sd	0.45	0.25	0.40	0.44	0.55	0.48	0.41	0.48	0.46
2000	0.41	0.51	0.50	0.67	0.37	0.49	0.59	0.55	0.59	0.51	0.42	0.26	0.39	0.40	0.53	0.49	0.42	0.45	0.47
2001	0.36	0.55	0.52	0.65	0.38	0.52	0.75	0.57	0.56	0.45	0.40	0.26	0.37	0.35	0.50	0.47	0.38	0.45	0.47
2002	0.38	0.58	0.52	0.67	0.37	0.50	0.75	0.58	0.54	0.46	0.44	0.26	0.39	0.33	0.49	0.48	0.39	0.38	0.47
2003	0.43	0.60	0.52	0.67	0.40	0.47	0.70	0.59	0.53	0.50	0.50	0.28	0.42	0.40	0.54	0.50	0.33	0.41	0.49
2004	0.48	0.64	0.55	0.67	0.41	0.49	0.67	0.61	0.56	0.51	0.50	0.29	0.44	0.42	0.55	0.52	0.33	0.46	0.50
2005	0.47	0.70	0.55	0.67	0.42	0.50	0.68	0.66	0.55	0.51	0.46	0.29	0.47	0.45	0.57	0.56	0.31	0.49	0.52
2006	0.49	0.75	0.54	0.64	0.47	0.54	0.68	0.70	0.56	0.54	0.51	0.32	0.44	0.53	0.58	0.61	0.35	0.50	0.54
2007	0.52	0.80	0.53	0.68	0.45	0.58	0.70	0.70	0.62	0.57	0.50	0.32	0.45	0.57	0.58	0.66	0.38	0.63	0.57
2008	0.52	0.88	0.56	0.71	0.48	0.57	0.69	0.70	0.57	0.58	0.43	0.32	0.43	0.63	0.59	0.74	0.35	0.65	0.58
2009	0.49	0.77	0.51	0.60	0.43	0.47	0.65	0.65	0.51	0.47	0.43	0.29	0.41	0.62	0.55	0.64	0.31	0.68	0.53
2010	0.48	0.83	0.53	0.63	0.45	0.46	0.71	0.69	0.53	0.49	0.45	0.31	0.44	0.64	0.68	0.70	0.32	0.67	0.56
2011	0.48	0.99	0.52	0.64	0.49	0.46	0.77	0.72	0.56	0.54	0.43	0.30	0.48	0.67	0.71	0.76	0.31	0.66	0.58
2012	0.47	1.04	0.51	0.65	0.47	0.46	0.77	0.71	0.55	0.52	0.46	0.30	0.51	0.69	0.67	0.75	0.30	0.63	0.58
2013	0.48	1.06	0.51	0.64	0.41	0.45	0.80	0.69	0.53	0.49	0.57	0.27	0.51	0.66	0.68	0.74	0.30	0.62	0.58
2014	0.47	1.01	0.49	0.64	0.43	0.44	0.80	0.69	0.52	0.50	0.51	0.31	0.53	0.63	0.74	0.72	0.32	0.62	0.58
2015	0.46	0.91	0.48	0.64	0.42	0.44	0.80	0.68	0.50	0.55	0.57	0.31	0.52	0.60	0.74	0.68	0.37	0.60	0.57
2016	0.45	0.84	0.47	0.63	0.39	0.44	0.69	0.64	0.49	0.59	0.60	0.33	0.53	0.62	0.75	0.65	0.33	0.56	0.56
2017	0.46	0.78	0.48	0.64	0.38	0.42	0.74	0.65	0.50	0.58	0.65	0.31	0.55	0.59	0.74	0.64	0.33	0.56	0.55
2018	0.47	0.75	0.49	0.66	0.39	0.41	0.77	0.68	0.50	0.55	0.66	0.33	0.46	0.54	0.73	0.67	0.34	0.55	0.55
2019	0.46	0.70	0.49	0.64	0.40	0.43	0.76	0.71	0.50	0.53	0.78	0.32	0.49	0.49	0.69	0.66	0.35	0.55	0.55
2020	0.46	0.55	0.50	0.63	0.35	0.45	0.66	0.70	0.49	0.45	0.73	0.39	0.48	0.38	0.69	0.60	0.31	0.58	0.52
2021	0.49	0.67	0.54	0.75	0.38	0.53	0.76	0.77	0.57	0.52	0.73	0.38	0.57	0.40	0.73	0.76	0.37	0.63	0.58

Appendix III.

CIT efficiency series 1990 - 2021 by country. CIAT

País	ARG	BOL	BRA	CHI	COL	CRI	ECU	ELS	HON	JAM	MEX	NIC	PAN	PAR	PER	RDO	URU	PROM
1990	0.13	sd	0.16	0.32	0.08	sd	sd	sd	0.17	0.33	sd	sd	0.04	sd	sd	sd	0.07	0.34
1991	0.17	sd	0.09	0.42	0.16	sd	sd	sd	0.19	0.24	sd	0.16	0.05	sd	sd	sd	0.09	0.38
1992	0.23	sd	0.17	0.52	0.12	sd	sd	sd	0.23	0.25	sd	0.28	0.09	sd	0.00	sd	0.14	0.41
1993	0.40	sd	0.14	0.46	0.11	sd	sd	sd	0.22	0.25	sd	0.25	0.10	sd	0.00	sd	0.18	0.48
1994	0.37	sd	0.20	0.58	0.10	sd	sd	sd	0.22	0.26	sd	0.08	0.12	sd	0.11	sd	0.18	0.45
1995	0.38	sd	0.25	0.65	0.09	sd	sd	sd	0.30	0.26	sd	0.12	0.15	sd	0.16	sd	0.19	0.46
1996	0.25	sd	0.32	1.32	0.08	sd	sd	sd	0.28	0.22	sd	0.14	0.10	sd	0.24	sd	0.22	0.45
1997	0.27	sd	0.27	1.22	0.09	sd	sd	sd	0.24	0.19	sd	0.16	0.17	sd	0.21	sd	0.19	0.46
1998	0.33	sd	0.29	1.55	0.07	sd	sd	sd	0.30	0.19	sd	0.16	0.09	sd	0.20	sd	0.24	0.47
1999	0.48	sd	0.28	1.17	0.07	sd	sd	sd	0.31	0.21	sd	0.17	0.16	sd	0.14	sd	0.25	0.46
2000	0.40	0.19	0.21	0.83	0.21	sd	0.15	sd	0.19	0.21	sd	0.16	0.13	0.11	0.12	sd	0.24	0.47
2001	0.41	0.22	0.20	0.75	0.28	sd	0.21	sd	0.25	0.16	sd	0.16	0.10	0.09	0.14	sd	0.22	0.47
2002	0.17	0.19	0.30	0.73	0.26	sd	0.22	0.18	0.24	0.17	0.01	0.20	0.07	0.09	0.13	0.54	0.18	0.47
2003	0.25	0.19	0.26	0.50	0.24	sd	0.23	0.22	0.25	0.20	0.00	0.29	0.07	0.08	0.19	0.45	0.15	0.49
2004	0.39	0.20	0.27	0.57	0.28	sd	0.26	0.23	0.26	0.16	0.00	0.27	0.10	0.11	0.19	0.33	0.24	0.50
2005	0.45	0.27	0.34	0.76	0.27	sd	0.31	0.28	0.29	0.19	0.08	0.28	0.11	0.16	0.26	0.46	0.33	0.52
2006	0.49	0.27	0.34	0.95	0.30	0.27	0.34	0.31	0.30	0.25	0.08	0.28	0.14	0.30	0.38	0.41	0.37	0.54
2007	0.51	0.30	0.37	0.99	0.36	0.29	0.33	0.39	0.34	0.26	0.10	0.29	0.15	0.31	0.46	0.60	0.31	0.57
2008	0.39	0.34	0.42	0.91	0.34	0.38	0.31	0.34	0.37	0.29	0.11	0.29	0.18	0.30	0.45	0.68	0.44	0.58
2009	0.39	0.40	0.45	0.90	0.40	0.36	0.41	0.39	0.36	0.28	0.11	0.37	0.26	0.46	0.40	0.82	0.47	0.53
2010	0.34	0.36	0.38	0.67	0.32	0.29	0.32	0.23	0.29	0.34	0.11	0.32	0.22	0.34	0.36	0.42	0.45	0.56
2011	0.36	0.35	0.44	0.73	0.34	0.29	0.38	0.33	0.33	0.30	0.12	0.38	0.18	0.44	0.45	0.47	0.41	0.58
2012	0.36	0.40	0.40	0.97	0.47	0.26	0.44	0.23	0.31	0.30	0.24	0.42	0.32	0.53	0.50	0.64	0.39	0.58
2013	0.33	0.42	0.42	0.80	0.42	0.30	0.53	0.33	0.35	0.30	0.38	0.49	0.30	0.43	0.45	0.64	0.48	0.58
2014	0.32	0.49	0.39	0.75	0.42	0.27	0.55	0.28	0.35	0.25	0.32	0.51	0.30	0.46	0.46	0.61	0.40	0.58
2015	0.33	0.63	0.38	0.67	0.44	0.30	0.86	0.24	0.36	0.29	0.41	0.51	0.28	0.49	0.38	0.51	0.44	0.57
2016	0.31	0.63	0.39	0.63	0.40	0.30	0.60	0.28	0.40	0.33	0.45	0.57	0.31	0.49	0.37	0.54	0.49	0.56
2017	0.29	0.52	0.32	0.59	0.40	0.30	0.55	0.29	0.39	0.40	0.43	0.56	0.25	0.49	0.32	0.54	0.51	0.55
2018	0.29	0.51	0.30	0.65	0.44	0.31	0.63	0.30	0.41	0.38	0.45	0.58	0.27	0.49	0.35	0.49	0.50	0.55
2019	0.29	0.55	0.31	0.71	0.43	0.34	0.56	0.31	0.36	0.41	0.44	0.60	0.24	0.59	0.36	0.57	0.45	0.55
2020	0.29	0.40	0.27	0.66	0.47	0.30	0.60	0.36	0.23	0.41	0.51	0.52	0.32	0.58	0.31	0.66	0.47	0.52
2021	0.25	0.29	0.39	0.44	0.39	0.34	0.43	0.32	0.27	0.40	0.38	0.66	0.09	0.56	0.34	0.64	0.47	0.58

Appendix IV.

C-Efficiency VAT Latin America and Caribbean VRR OECD Countries

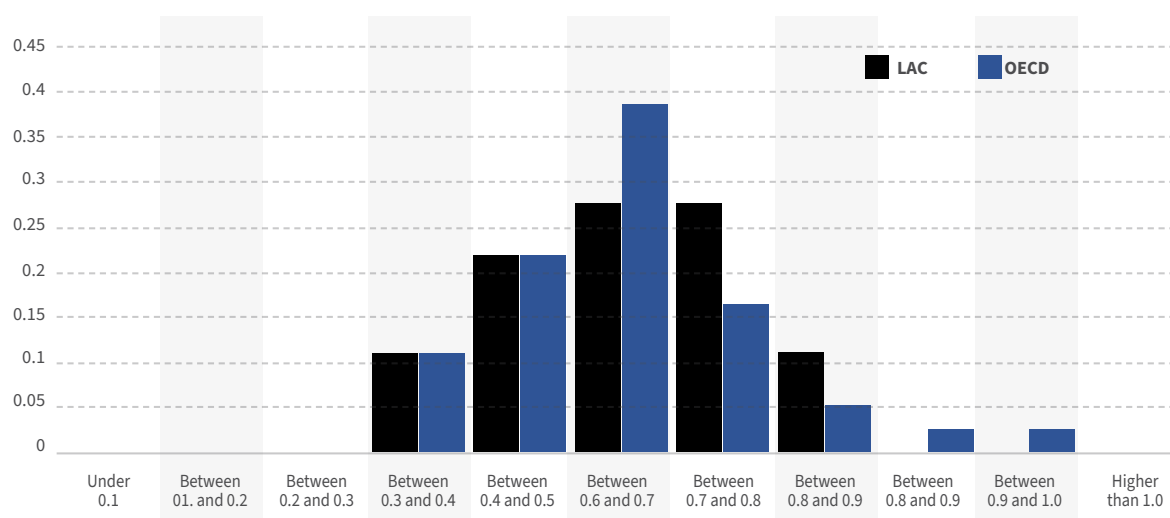
OECD (2021)³⁶, in the thirteenth update of its publication on consumption tax trends, calculates, and renews the VRR for all its member countries. According to this publication, the objective is to provide comparative measures of countries' ability to effectively secure the potential VAT tax base.

As mentioned in the previous sections, the VRR and the C-Efficiency are directly comparable indicators as they are based on the same set of statistics which operate in the same positions in the calculation of the ratio.

The recent OECD publication estimates for a set of 36 countries, members of that organization, the VRR indicator for the period from 1992 to 2018. Our ratio was calculated for the period 1990 - 2021, which includes the entire period considered in the reference work, for a set of 18 countries. The OECD publication and the Latin American and Caribbean countries selected in our sample have three countries in common: Chile, Mexico, and Colombia. The estimates for these three countries coincide in both studies.

36 Consumption Tax Trends 2020: VAT/GST and Excise Rates, Trends and Policy Issues. 2021.

Figure 8. Relative Frequency Distribution Histograms.
OECD_{VRR} & LAC_{CEFC} Average 2016 - 2018.



It is very interesting to appreciate the similarities in the distribution of the results for both indicators. The figure above does so for the average values of the country index for the most recent three-year period available in each of the papers. 2016 to 2018, i.e., the most recent three-year period available in both papers. In none of the 53 countries analyzed (36 OECD, 18 LA and C and 3 in common), the C-Efficiency (or the VRR) are below 0.3. In fact, the lowest value corresponds to the same country for both studies.

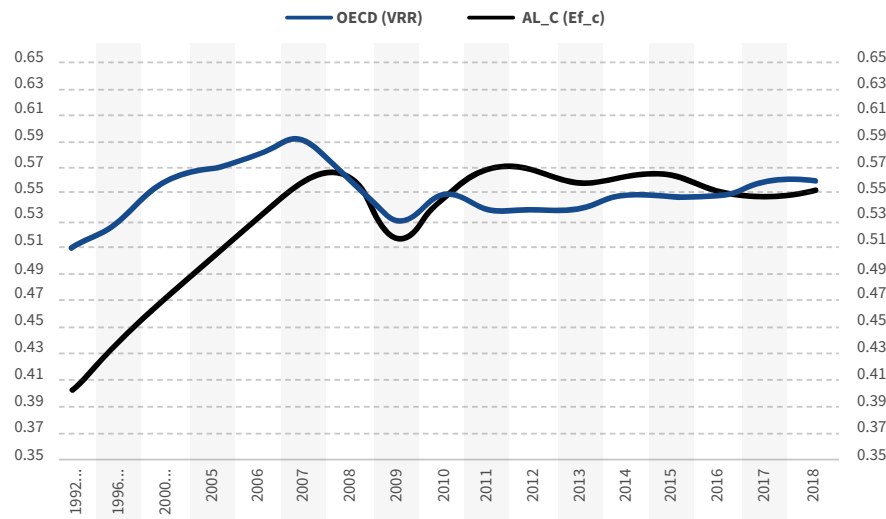
Within the illustrative framework presented, it is discernible that solely within the realm of the OECD (VRR) exceeding the threshold of 0.8 are evident on the right side of the depicted figure. More specifically, two instances within the OECD exhibit VRR surpassing 0.8, with one of them falling within the range of 0.9 to 1.0. In contrast, the upper echelons of Efficiency_C values in Latin America and the Caribbean are constrained to the interval spanning 0.7 to 0.8.

It is observed that within the OECD dataset, there exists a mode in the Relative Revenue Variability (RRV) observations situated within the range of 0.5 to 0.6, with 14 out of 36 observations falling within this interval. Conversely, within the Latin America and Caribbean dataset, a bimodal distribution is evident, with modes in both the 0.5 to 0.6 and 0.6 to 0.7 ranges, encompassing 10 out of 18 observations. The mean value of the indicator for both sets of countries is consistently situated between 0.55 and 0.56³⁷ over last three years.

³⁷ Average ((OECD = 0.559, LAC = 0.551), Median (OECD = 0.552, LAC = 0.570), Standard Deviation (OECD = 0.132, LAC = 0.121).

From the perspective of this metric, it is evident that both groups of nations are attaining comparable levels of collection efficiency employing identical instruments. Given the longitudinal scope of both investigations, an examination of the historical average values for both sets of nations becomes feasible. The ensuing figure illustrates these sequences.

Figure 9: Evolution of revenue collection efficiency indicators. Annual averages
OECD_{VRR} & LAC_{EF_C} 1992 – 2018.



In the period analyzed, we observe that both indicators show a similar trajectory. First, a period of growth (from approximately 0.50 to 0.60 in OECD countries between 1992 and 2007 and from approximately 0.40 to 0.55 in LAC countries between 1992 and 2008). This was followed by a drop in the OECD countries between 2008 and 2009 and in Latin America in 2009, followed by an immediate recovery in the following year, until stable levels of around 0.55 to 0.57 were maintained until the end of the series. The main difference is the better dynamics of the indicator in Latin America and the Caribbean at the beginning of the series.

Value-Added Tax serves as a cornerstone for revenue generation in both Latin American and Caribbean nations, as it is in OECD countries. The deceleration in the enhancement of collection efficiency noted until 2007 (2008) is attributable to the constituents comprising the tax gap. Advancements within our regional countries in combatting non-compliance are discernible, as indicated by sporadic studies addressing VAT evasion. Conversely, the policy component, encompassing tax expenditures, appears to exhibit a more stringent resistance to positive shifts. Notwithstanding progress, there remains untapped potential for augmenting the collection capacity of this fiscal instrument.

Appendix V.

VRR Ratio Series. OECD countries

Country	1992	1996	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Australia				0.56	0.54	0.54	0.49	0.51	0.49	0.47	0.47	0.49	0.48	0.50	0.50	0.48	0.47
Austria	0.61	0.60	0.61	0.58	0.57	0.58	0.59	0.58	0.58	0.58	0.59	0.58	0.58	0.59	0.59	0.60	0.60
Belgium	0.50	0.46	0.51	0.50	0.51	0.51	0.49	0.47	0.49	0.48	0.48	0.47	0.47	0.46	0.47	0.47	0.47
Canada	0.43	0.47	0.49	0.50	0.47	0.51	0.49	0.49	0.49	0.48	0.47	0.47	0.47	0.48	0.48	0.49	0.49
Chile	0.63	0.67	0.64	0.67	0.64	0.68	0.71	0.60	0.63	0.64	0.65	0.64	0.64	0.64	0.63	0.64	0.64
Colombia			0.35	0.42	0.47	0.45	0.48	0.43	0.44	0.49	0.46	0.41	0.42	0.41	0.38	0.37	0.38
Czech Republic		0.43	0.42	0.56	0.52	0.54	0.56	0.55	0.52	0.55	0.57	0.56	0.58	0.58	0.60	0.62	0.61
Denmark	0.56	0.57	0.59	0.62	0.64	0.65	0.61	0.58	0.57	0.58	0.59	0.57	0.57	0.58	0.60	0.61	0.62
Estonia		0.72	0.71	0.70	0.82	0.81	0.67	0.73	0.66	0.67	0.69	0.66	0.69	0.72	0.72	0.74	0.74
Finland		0.54	0.61	0.61	0.61	0.60	0.58	0.56	0.55	0.56	0.56	0.55	0.55	0.54	0.55	0.56	0.57
France	0.54	0.53	0.51	0.52	0.52	0.51	0.50	0.47	0.48	0.48	0.48	0.48	0.48	0.49	0.49	0.50	0.51
Germany	0.61	0.60	0.61	0.55	0.57	0.55	0.56	0.55	0.55	0.56	0.56	0.55	0.55	0.56	0.56	0.56	0.57
Greece	0.47	0.41	0.45	0.47	0.46	0.48	0.46	0.39	0.44	0.37	0.37	0.36	0.37	0.38	0.44	0.43	0.44
Hungary	0.30	0.43	0.52	0.48	0.54	0.58	0.56	0.61	0.52	0.51	0.52	0.52	0.56	0.59	0.55	0.56	0.59
Iceland	0.63	0.54	0.58	0.61	0.64	0.59	0.52	0.44	0.42	0.42	0.43	0.43	0.44	0.51	0.53	0.57	0.55
Ireland	0.45	0.52	0.61	0.66	0.67	0.63	0.55	0.46	0.47	0.46	0.44	0.45	0.48	0.48	0.49	0.48	0.49
Israel		0.66	0.62	0.61	0.62	0.66	0.65	0.65	0.65	0.66	0.64	0.65	0.63	0.63	0.63	0.63	0.63
Italy	0.37	0.39	0.43	0.39	0.41	0.41	0.39	0.36	0.40	0.40	0.37	0.37	0.37	0.37	0.37	0.39	0.38
Japan	0.68	0.71	0.68	0.70	0.70	0.68	0.66	0.66	0.68	0.68	0.68	0.69	0.69	0.73	0.72	0.72	0.72
Korea	0.62	0.57	0.58	0.61	0.60	0.60	0.60	0.62	0.64	0.64	0.66	0.64	0.66	0.60	0.66	0.69	0.68
Latvia		0.53	0.51	0.57	0.61	0.61	0.49	0.38	0.42	0.42	0.46	0.49	0.51	0.52	0.54	0.54	0.58
Lithuania		0.46	0.52	0.52	0.56	0.61	0.58	0.47	0.49	0.51	0.50	0.50	0.51	0.51	0.51	0.53	0.53
Luxembourg	0.45	0.54	0.68	0.85	0.82	0.96	0.96	0.97	0.99	1.06	1.11	1.16	1.23	0.95	0.92	0.86	0.89
Mexico	0.30	0.21	0.25	0.29	0.32	0.32	0.33	0.30	0.32	0.31	0.31	0.28	0.32	0.32	0.33	0.32	0.34

Appendix V. VRR Ratio Series. OECD countries

Country	1992	1996	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Netherlands	0.55	0.54	0.57	0.55	0.57	0.58	0.56	0.52	0.54	0.52	0.52	0.47	0.47	0.49	0.51	0.52	0.53
New Zealand	0.96	0.99	0.99	1.03	1.03	0.96	0.96	0.97	1.10	0.93	0.94	0.94	0.96	0.97	0.96	0.99	0.99
Norway	0.58	0.61	0.67	0.57	0.61	0.63	0.57	0.55	0.56	0.56	0.57	0.57	0.56	0.56	0.57	0.57	0.58
Poland	0.00	0.42	0.42	0.47	0.51	0.53	0.50	0.45	0.47	0.47	0.43	0.42	0.44	0.44	0.45	0.50	0.52
Portugal	0.46	0.55	0.60	0.56	0.51	0.51	0.49	0.43	0.48	0.45	0.47	0.46	0.49	0.50	0.49	0.51	0.52
Slovak Republic	0.00	0.45	0.43	0.61	0.58	0.53	0.53	0.47	0.46	0.49	0.43	0.47	0.49	0.52	0.50	0.52	0.52
Slovenia	0.00	0.00	0.68	0.67	0.68	0.69	0.68	0.59	0.59	0.59	0.57	0.59	0.58	0.58	0.58	0.59	0.60
Spain	0.59	0.44	0.52	0.56	0.56	0.52	0.41	0.29	0.44	0.38	0.40	0.39	0.41	0.43	0.43	0.44	0.45
Sweden	0.40	0.49	0.51	0.54	0.55	0.56	0.57	0.55	0.57	0.57	0.55	0.55	0.55	0.57	0.58	0.59	0.59
Switzerland		0.67	0.73	0.72	0.74	0.73	0.74	0.70	0.72	0.71	0.71	0.71	0.70	0.69	0.68	0.69	0.69
Turkey	0.37	0.43	0.46	0.40	0.42	0.38	0.37	0.36	0.41	0.44	0.40	0.44	0.40	0.42	0.40	0.41	0.40
United Kingdom	0.42	0.43	0.44	0.44	0.44	0.44	0.43	0.43	0.44	0.44	0.43	0.44	0.44	0.45	0.45	0.45	0.45
Unweighted Average	0.51	0.53	0.56	0.57	0.58	0.59	0.56	0.53	0.55	0.54	0.54	0.54	0.55	0.55	0.55	0.56	0.56

Source: Consumption Tax Trends 2020: VAT/GST and Excise Rates, Trends and Policy Issues. 2021.

Appendix VI.

Series of Efficiency Rate and Tax Burden Index

VAT and CIT 2000 – 2018

Currency / Year	VAT efficiency rate	CIT efficiency rate	VAT Tax burden index	CIT Tax burden index
1990	100,0	100,0	100,0	100,0
1991	110,5	108,8	109,2	103,8
1992	121,1	125,2	120,5	113,2
1993	140,2	130,8	130,6	106,7
1994	133,3	137,9	134,9	106,2
1995	135,2	157,7	139,4	117,2
1996	132,6	195,9	144,4	113,5
1997	136,3	187,0	147,9	117,1
1998	139,3	212,4	151,1	107,7
1999	135,4	200,4	152,7	101,1
2000	139,3	150,2	155,4	113,1
2001	138,8	151,9	158,4	116,8
2002	138,8	142,5	158,8	122,0
2003	143,5	138,9	164,0	134,3
2004	148,4	149,2	170,7	151,7
2005	151,9	187,3	175,7	179,5
2006	159,4	211,2	181,6	203,3
2007	167,4	232,3	188,6	215,1
2008	169,9	238,7	192,7	212,6
2009	154,7	264,3	177,0	205,7
2010	163,7	210,3	185,0	197,9
2011	171,3	228,8	191,2	215,0
2012	170,9	261,8	191,0	223,3
2013	170,2	268,1	190,6	226,5
2014	169,1	260,1	193,4	214,0
2015	167,9	274,0	193,0	219,8
2016	163,3	273,6	188,9	224,5
2017	163,0	261,2	190,5	229,3
2018	162,5	267,6	191,5	236,7
2019	162,7	274,3	190,9	237,5
2020	153,6	268,5	182,7	221,6
2021	171,8	242,8	200,3	235,8



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