SYSTEMATIC REVIEW OF EVIDENCE ON THE IMPACT OF TAX INCENTIVES IN LATIN AMERICAN AND CARIBBEAN COUNTRIES

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ABSTRACT

This report provides a systematic review of the impact of tax incentives on investment and economic growth in Latin American and Caribbean (LAC) countries. While tax incentives are widely used to attract foreign direct investment (FDI), stimulate employment, and promote sectoral development, empirical evidence on their effectiveness remains mixed. The analysis reveals that although some incentives have successfully increased investment in targeted sectors, many fail to deliver significant economic benefits, often leading to substantial revenue losses. A critical gap in this report is the lack of comprehensive ex-ante evaluations, with most studies focusing on ex-post assessments. Cost-benefit analyses indicate that broad-based tax incentives are less efficient than targeted schemes, particularly in research and development (R&D) and export-oriented industries. The findings highlight the need for improved evaluation frameworks, better governance, and more strategic tax incentive policies to ensure sustainable economic growth.

Keywords: Corporate Income Tax, Cost-Benefit Analysis (CBA), Economic Growth, Investment Policy, Fiscal Policy, Public Finance, Foreign Direct Investment (FDI), Latin America and the Caribbean (LAC), Special Economic Zones (SEZs), Tax Incentives

JEL Classification: F21, H20, H25, H32, O23

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Executive Summary

This study surveys the use of tax incentives in stimulating business investment and creating jobs in developing countries, with a particular focus on Latin American and Caribbean (LAC) countries. Despite the widespread use of these incentives, the limited empirical evidence and the skepticism of many economists of their efficacy hinder evidence-based policy-making.

In this sense, this study seeks to fill that gap by analyzing the effects of the use of various investment tax incentives in the LAC countries based on a systematic review of the existing literature, which analyzes their impact either by individual countries or at a regional level.

The corporate income tax systems in Latin America and the indirect tax system, to a lesser degree, contain a wide variety of tax incentives. Many LAC countries have designed tax incentives to create employment opportunities by attracting foreign investment or by expanding the quantity of investment in particular activities or sectors.

The main sectors that have been targeted for promotion by countries in the LAC region are manufacturing, tourism, renewable energy, and research and development. Furthermore, nearly all countries in the region implement targeting strategies to provide tax incentives to businesses situated in less developed areas or special zones designed to both create employment and boost the foreign exchange earnings of a country.

The analysis reveals that most research prioritizes assessing whether tax incentives have been able to achieve their desired objectives in terms of increasing sectoral activities rather than evaluating their cost-efficiency or overall economic viability. The limited use of cost-benefit analysis indicates a significant gap in the adoption of a comprehensive evaluation framework that enables quantification of the net economic benefit (or cost) of introducing tax incentives. Furthermore, a large body of research articles has been conducted to measure the impact of these incentives after they are put into effect. Very few studies are published that report on ex-ante analysis of tax incentives.

The findings of the ex-post empirical studies are quite mixed. Usually for every study that finds that the income tax incentive causes an expansion of investment or economic activity in the target activity in one country, there are one or more studies that find little or no response elsewhere from the tax incentive. Most of these studies are econometric in nature.

The analysis reveals that any array of tax incentives is usually not sufficient to attract foreign investors. The investment decision is usually made on the fundamental financial attractiveness of the activity, the availability of the needed labor skills, the risk associated with the country, and the quality of the infrastructure.

Governments must first ensure that tax incentive policies deliver value for money by conducting an effective ex-ante assessment of the new initiatives. This becomes particularly important in industries where incentives could potentially focus on investments that would have happened anyway making the tax benefits unnecessary and costly.

A fundamental requirement for the tax measure to achieve the desired response is that it creates a significant incentive to encourage the activity to be undertaken. Often, when a micro financial and economic analysis is undertaken at the project level, one will find that it is other fundamental issues that are more important than the tax system in determining the overall attractiveness of the investment or expansion in an activity. It is important not to know only how the tax incentive affects the profitability of the activity, but it is important to understand if the activity if incentivized, is worthwhile economically to undertake for the country.

From a stakeholder perspective, the government needs to understand the cost of such an incentive. To enhance the cost-effectiveness of an incentive it should be designed to reward the owners of the project based on their success in implementing the project, rather than a general sector-wide tax expenditure that ends up transferring scarce government revenue to the private sector to increase their rate of return on all new and existing investments in a particular sector.

1 Introduction

Tax incentives have become a more common policy to promote investment in developing economies. Many governments including the Latin American and Caribbean (LAC) countries are trying to reallocate and encourage foreign and domestic investment by using tax incentives in which certain economic activities are accorded a more favorable tax treatment. These incentives include income tax holidays, reduced corporate income tax (CIT) rates, investment tax credits, investment allowances, accelerated depreciation, and VAT and customs duty exemptions.

Proponents of such incentives assert that these mechanisms foster investment and employment opportunities, whereas critics argue that they lack efficacy, incur substantial tax expenditures, distort investment patterns, enable corrupt practices, and render the tax system convoluted and opaque.

In view of the above, the objective of this study is to review and analyze the existing literature on the effects of investment tax incentives in Latin American and Caribbean (LAC) economies. The rest of the paper is organized as follows. Section 1 describes the advantages and disadvantages of general tax incentives and the main tax incentives offered in LAC countries. Section 2 provides an explanation of the research design and methodology used in conducting the systematic review. Empirical evidence on the effectiveness and efficiency of tax incentives is presented in Section 3. Section 4 presents a brief lesson from international experiences. A proposed guideline for the appraisal of corporate tax incentives is introduced in section 5. The last section concludes.

1.1 Types and Advantages and Disadvantages of General Tax Incentives

Tax incentives are special tax provisions that favor certain types of investments, investors, or products. Their intention is to lower the effective rate of taxation. Tax incentives can apply to both domestic and foreign investments and for any purpose. They can be found throughout tax and investment laws. In statutory terms, a tax incentive can be defined as a special tax provision granted to qualified investment projects that represents a statutorily favorable deviation from a corresponding provision applicable to all other investment projects. (i.e., projects that receive no special tax provision). An implication of this definition is that any tax provision that is applicable to all investment projects does not constitute a tax incentive. Hence, for example, a tax provision that allows the profits of a foreign funded investment project to be taxed at half the rate that applies

to domestic companies would constitute a tax incentive, but a provision that simply sets a low CIT rate for all firms would not constitute a tax incentive. (Zee, Stostky and Ley, 2002).

Tax incentives take several different forms depending on where they fit into the structure and administration of the tax system. In general, they can be grouped into tax holidays, reduced CIT rates, investment allowances and tax credits, accelerated depreciation, exemptions from indirect taxes such as import tariffs on inputs, and export processing zones (special zones for exporters; enterprises in the zones are typically exempt from all indirect taxes and, in some cases, all direct taxes). Table 1 provides a summary of the distinct types of tax incentives.

Table 1 Main Forms of Tax Incentives

Instrument	**Description**	**Example**
Tax holidays	Temporary exemption of a firm or investment from certain specified taxes, (typically at least corporate income tax) for a specified period. Sometimes administrative requirements are also waived, notably the need to file tax returns. Businesses may be able to carry forward losses from the holiday period.	Company (A) is exempted from corporate income tax for the first 5 years.
Reduced corporate income tax (CIT) rates	Reduction of the corporate income tax rate without a full exemption on qualifying income to particular types of activity (e.g. manufacturing), locations, or regions.	Company (A) benefits from a lower corporate income tax rate of 10% instead of the standard CIT rate of 22%.
Investment allowance	Deduction of a certain proportion of an investment from taxable profits (in addition to depreciation). The value of an allowance is the product of the allowance and the tax rate.	Company (A) investing amount (X) in machinery can deduct 20% from taxable income.
Investment tax credit	Credit against the overall tax liability is given for a specified portion of the qualifying investment expenditures. Rules differ regarding excess credits (credits in excess of tax liability) and include the possibility that they may be lost, carried forward, or refunded.	Company (A) receives a (X) tax credit amount for R&D spending, reducing tax owed (tax liability) by the same amount of (X).
Accelerated depreciation	Certain investments may receive depreciation of capital assets at a faster rate than others available for the same type of investments. This can be implemented in many different ways, including higher first-year depreciation allowances, or increased depreciation rates. The total tax liability is unchanged in nominal terms but the timing changes, thus creating benefits in present value terms.	An investment project can depreciate 50% of the investment amount (e.g., plant and machinery, buildings) in the first year instead of the standard depreciation rate of 10%.

Exemptions from indirect taxes	Exemption from certain taxes, often those collected at the border such as tariffs, excises, and VAT on imported inputs.	Manufacturer importing machinery worth amount (X) avoids 20% import duty.
Special zones	Geographically limited areas in which qualified firms can locate and thus benefit from exemption of varying scope of taxes and/or administrative requirements (such as lower tax rates, duty exemptions, and streamlined regulations). Zones are often aimed at exporters and are located close to a port.	Company(A) setting up in a Special Economic Zone (SEZ) enjoys exemption from corporate income tax (or reduced CIT rate), and exemptions from customs duties and/or import taxes, VAT, or sale taxes.

Sources: the description of the main types of tax incentives is primarily based on Klemm, A. (2010). Causes, Benefits, and Risks of Business Tax Incentives. *Published in International Tax and Public Finance*.

The various types of tax incentives for investment in Table 1 can be broadly categorized into (i) Profit-based incentives (i.e., those determined as a percentage of profit, including tax holidays, reduced CIT), (ii) Expenditure-based (or capital investment-based), (i.e., those that reduce the after-tax cost of capital investment expenditure, including investment allowance, accelerated depreciation, tax credits and the like) and (iii) other tax incentives include reduced rates on indirect taxes (e.g. VAT, duties, and tariffs), taxes on labor, land, social security contributions, and other payments. Profit-based incentives provide tax relief based on earnings and not on new investments. In this regard, they are particularly attractive to mobile FDI. Expenditure-based incentives, by contrast, tend to promote re-investment and therefore further integration into the local economy. In addition, expenditure-based incentives typically target specific types of capital investments or activities that can be associated with countries' sustainable development objectives. [1]

Theoretical studies conclude that not all tax incentives are equally effective in promoting investment, economic growth, and employment, with accelerated depreciation schemes, immediate deductions, and tax credits being preferable to tax holidays, other exemptions, and reduced rates. A joint report by four international organizations emphasizes that tax incentives that reduce the cost of capital investment are often preferable to tax incentives based on corporate profits. The cost-based incentives seek to reduce the cost of capital to make more projects profitable and generate investments that would not otherwise have been undertaken. Tax incentives based on profits or benefits generally reduce the tax rate applicable to taxable income; therefore, one of their effects is the foregoing of tax revenues to make investment projects even more

[1] See UNCTAD (2022).

profitable than they already were and that would have been carried out even without the incentive. (IMF, OECD, UN and World Bank, 2015).

Table 2 summarizes the main advantages and disadvantages of the different tax incentives commonly used. Policymakers are encouraged to consider whether the potential costs associated with these fiscal incentives more than offset their benefits in terms of attracting investment.

Table 2 Pros and Cons of Various Tax Incentives Instruments

	Pros	**Cons**
Profit-based instruments	• Strong signaling effect to investors, easy to communicate and advertise	• Disproportionately favors investments with high-profit margins that would have likely occurred anyway and investments with short time horizons (in the case of timebound holidays and concessions). • Typically granted against up-front assurances from the investor rather than actual performance in terms of expected outcomes such as investment or jobs generated. • Prone to abuse through profit shifting within firms. • High fiscal risk owing to little predictability of actual fiscal cost.
	• Tax holidays only: Investors may appreciate complete liberation from interaction with tax authorities for the duration of the holiday.	• Tax holidays only: Liberating investors from tax filing requirements makes it impossible to monitor the costs of incentives in terms of forgone revenue.
Cost-based instruments	• The amount of benefit to investors is directly linked to the amount invested. • Tax revenue loss is more predictable than under-profit-based instruments. • Less prone to abuse through profit shifting than profit-based instruments. • Does not liberate firms from filing taxes, which makes the process more transparent and allows tracking of costs in terms of foregone revenue. • Accelerated depreciation only: The nominal tax burden is not actually reduced, but payment is merely deferred to a later stage of the investment.	• More challenging to administer. • May bias production technology toward more capital-intensive investment.

Source: Andersen, M. R., Kett, B. R., & von Uexkull, E. (2018). Corporate tax incentives and FDI in developing countries. Published in 2017/2018 Global Investment Competitiveness Report.

1.2 Main Tax Incentives Offered in LAC Countries

This study has updated the tax-related incentives in the LAC region as outlined in the ECLAC/Oxfam International (2019) report based on data through the International Bureau of Fiscal Documentation's (IBFD's) Tax Research Platform, which provides up-to-date and detailed information on tax regulations and policies worldwide until 2024.

The types of incentives utilized differ within the region in terms of their design and coverage due to the varying goals of the individual countries. Table 3 summarizes the main fiscal incentives offered in the LAC region in 2024 (see Annex B for a detailed description of tax incentives by country). In general, tax incentives are targeted to attract investment in specific types of activity or geographic areas. The main specific sector targets in the region are manufacturing, tourism, renewable energy, and research and development (founded in more than 10 out of 17 countries), alongside location-specific incentives for less developed areas, and special zones focus on export orientation activities and promoting development in those areas.

In most of the LAC countries analyzed corporate tax holidays are a prominent feature found in 15 out of 17 LAC countries, with Argentina and Mexico being the exceptions. These incentives have varying periods of time, based on industry and location factors. The range spans from 3 years in Ecuador for new microenterprises to 50 years in Chile for businesses that invest in Region XII focusing mainly on industrial, mining, and tourism activities. The country also extends other long-term incentives like 44-year tax holidays for companies operating within special zones, (Tierra del Fuego). The average duration of tax holidays across the region tends to fall between 10 and 15 years, with countries such as Bolivia, Brazil, Guatemala, Paraguay, and Uruguay proving tax exemption within this range. The principal target of most of these incentives is the special zones.

In addition to corporate tax holidays, reduced corporate income tax rates are offered in 12 out of 17 LAC countries. Some countries use this incentive to achieve specific regional development goals. In Brazil's northeastern regions companies are encouraged with a 75 percent decrease, in taxes, for initiatives located in SUDENE and SUDAM development zones aimed at boosting infrastructure improvements.

Other countries such as Costa Rica and Panama use this type of incentive in promoting investment in industrial activities. For instance, Costa Rica provides reduced rates of 0%,5%,6%, or 15% for

industries located in Free Trade Zones (FTZs) depending on the location and amount of investment. Panama provides a reduction CIT rate of 5% to the multinational companies providing manufacturing services.

Investment tax credits are also commonly used in areas to promote spending in industries such as productive investments (Argentina, Chile, Mexico, Peru, Uruguay), research and development (R&D) (Argentina, Brazil, Colombia, Ecuador, Mexico), renewable energy projects (Ecuador, El Salvador, Dominican Republic). In addition, Honduras uses an employment tax credit to encourage job creation.

Businesses in sectors that seem to depend excessively on capital assets are often granted to implement accelerated depreciation incentives to recover their investment expenses at a pace. For example, Chile, along with Ecuador, Mexico, and Nicaragua are known for using depreciation in new fixed assets or new projects in general. Furthermore, this tax benefit is aimed at assisting industries, in the LAC area like the construction sector in Peru, the tourism sector in Uruguay, the mining industry in Argentina, manufacturing in Bolivia, and renewable energy in Argentina as well, as Colombia and Panama.

Nearly, all countries in the region have special incentive regimes for companies located in underdeveloped areas or designated special zones, like free zones and special economic zones. The typical special economic zone policy package includes import and export duty exemptions, streamlined customs and administrative controls and procedures, liberal foreign exchange policies, and income tax incentives all meant to boost an investment's competitiveness and reduce business entry and operating costs.

A tax holiday of up to 10 years is granted for export-oriented activities in Guatemala, for international service providers and textile manufacturers located in Public Economic Development Zones (ZDEPs) under the regime of the Santo Tomás de Castilla Free Trade and Industrial Zone (ZOLIC). Similarly, Honduras has established Industrial Processing Zones for Exports (ZIP), which provide up to 20 years of complete income tax exemption for companies focused on manufacturing goods intended for international markets, particularly those targeting non-Central American countries. In addition, the importation of production machinery, raw materials, and supplies are exempted from indirect taxes. Panama also participates in this framework through its

Colon Free Zone (CFZ) exports. Companies incorporated in the CFZ that engage in the activities established in Law 9 of 2016 will enjoy exemption from Corporate Income Tax (CIT) for 10 years. Also, there are no import duties on goods brought into the CFZ for re-export. In Nicaragua, the Export Free Trade Zone Law provides for several types of export-free zones (e.g. for processing, industrial production, logistics, and outsourcing services). FTZ users are qualified for a 10-year income tax holiday, which can be extended for an additional 10 years. Once the full tax exemption expires, qualifying companies will be entitled to a 60% exemption. Furthermore, Raw materials, machinery, equipment, spare parts, samples, molds, and accessories required for the operation of companies in the FTZs are exempt from import duties.

Table 3 Latin America and the Caribbean: Main tax incentives for companies, 2024

	Corporate Income Tax Incentives																	
						Sectoral Incentives												
Country	Tax holidays (Years)	Reduced Rates or Income Tax Reduction	Deductions or Credits for Investment	Accelerated Depreciation	Tax Stability Contracts	Agriculture, fishing	Forestry	Mining	Renewable energy	Industry	Tourism	International services	Culture	R&D/ R&D +I	Other	Location Incentives	Free / Special Zones	Exemption from Indirect taxes/Tariffs
Argentina	-	Yes, tax reduction	Yes, both	Yes, certain sectors	Yes. certain sector		✓	✓	✓	✓				✓	✓	Yes	Yes	Yes, Free zones, Tierra del Fuego, and certain sectors
Bolivia	10 (cities of Oruro and Potosi)	No	No	Yes	-			✓		✓			✓		✓	Yes	Yes	Free zones, certain sectors
Brazil	10 (north and northeast)	Yes, certain sectors	Yes, both	Yes	No					✓		✓	✓	✓	✓	Yes	Yes	Export sector, free zones, certain sectors, and some imports of machinery and equipment
Chile	44, 50	Yes, certain sectors	Yes, certain sectors	Yes	Yes		✓	✓		✓				✓	✓	Yes	Yes	VAT exemption on imported capital assets for qualified foreign investors / free zone imports
Colombia	5, 15, 20 depending on sector and area, SEZs)	Yes, certain sectors	Yes, both	Yes, certain sectors	Yes		✓		✓		✓		✓	✓	✓	Yes	Yes	Temporary importation, machinery, and supplies in certain sectors, border
Costa Rica	6, 8, 12 (FTZ depending on location)	Yes, smaller companies, FTZ	Yes, certain sector	Yes, certain sectors & according to TA	-	✓	✓				✓					Yes	Yes	Export sector; machinery, equipment, and supplies in certain sectors;
Ecuador	3, 5, 8, 10, 12, 15, 20 (depending on sector and area, SEZs)	Yes (reinvestment and SEZs)	Yes, both	Yes, according to TA	Yes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Yes	Yes	Exporters, machinery and supplies, certain sectors
El Salvador	5, 10, 15 (depending on sectors and areas)	Yes, smaller companies	Yes, certain sector	No	-				✓		✓	✓	✓			Yes	Yes	Importation of machinery, equipment, and supplies for certain sectors, free trade zones
Guatemala	10 years, (depending on areas)	No	No	No	No				✓	✓		✓				-	Yes	Maquila, free zone; Importation of machinery, and materials in certain sectors
Honduras	10, 12, 15, 20 (certain sectors and areas)	Yes, SEZs	Yes	Yes	No	✓			✓		✓	✓				Yes	Yes	Free zones; certain sectors; Imports of capital goods, etc. for the RIT Temporary Import Regime

	Corporate Income Tax Incentives																	
						Sectoral Incentives												
Country	**Tax holidays (Years)**	**Reduced Rates or Income Tax Reduction**	**Deductions or Credits for Investment**	**Accelerated Depreciation**	**Tax Stability Contracts**	**Agriculture, fishing**	**Forestry**	**Mining**	**Renewable energy**	**Industry**	**Tourism**	**International services**	**Culture**	**R&D/ R&D +I**	**Other**	**Location Incentives**	**Free / Special Zones**	**Exemption from Indirect taxes/Tariffs**
México	-	No	Yes, both	Yes	-	✓		✓	✓	✓	✓		✓	✓	✓	Yes	Yes	Export sector, maquila /IMMEX companies, certain sectors.
Nicaragua	7, 10, 15,20 (depending on sectors and areas)	Yes, fishing activities & lower income companies	-	Yes (exporters)	-	✓	✓		✓	✓	✓				✓	Yes	Yes	Export sector; free zones; certain sectors; certain raw materials, capital goods, etc.
Panama	5,10,13,15,25 (depending on sector and area, SEZs)	Yes, MNC	Yes, both	Yes (wind power)	Yes		✓		✓	✓	✓	✓	✓	✓	✓	Yes	Yes	Export sector, free trade zones, and other sectors
Paraguay	10 (approved investment projects)	Yes	No	No	Yes	✓				✓				✓	✓	Yes	Yes	Export sector, free zones, maquila, other sectors, capital goods for certain investments
Peru	Until 2042 (Special Development Zones (SDZs))	Yes (sectors)	Yes, both	Yes, certain sectors	Yes	✓		✓		✓			✓	✓		Yes	Yes	Export sector, free zone, SDZs, certain sectors, and Jungle Regions.
Dominican Republic	5, 10,15,25 (depending on sectors and areas)	No	Yes, both	Yes (Innovation incentives)	Yes				✓	✓	✓	✓	✓		✓	Yes	Yes	Export sector, free and special zones, others/certain machinery, equipment, and materials
Uruguay	5, 10, 15 (depending on sectors)	No	Yes, both	Yes, certain sectors	-	✓	✓	✓		✓	✓	✓		✓	✓	Yes	Yes	Export sector, free zones, free ports, others/machines, equipment, etc. for certain sectors

Source: updated the ECLAC/Oxfam International (2019) report with data from the International Bureau of Fiscal Documentation (IBFD) Tax Research Platform, up to 2024.

Notes: SEZs: Special Economic Zones; SDZs: Special Development Zones; FTZ: Free Trade Zone; MNC: Multinational Corporation; TA: Tax Administration; VAT: Value Added Tax; RIT: Regimen de Importación Temporal (Temporary Import Regime); IMMEX: Industria Manufacturera, Maquiladora y de Servicios de Exportación (Manufacturing Industry, Maquiladora, and Export Service)

2 Methodology

The purpose of this section is to describe the process of conducting the systematic literature review and providing a summary of the descriptive findings from the literature addressing the effect of fiscal incentives on stimulating investment, employment, and economic growth. To this end, standards outlined by Tranfield et al. (2003) were implemented. These standards include defining research questions, and inclusion criteria, specifying the search and selection of studies, and conducting data extraction and analysis. In this section, we briefly describe these steps.

2.1 Research questions, database, and criteria for inclusion or exclusion

Starting from the research questions, this study investigates the following:

- What types of tax incentives are investigated in the LAC region?
- What methods are employed to perform the ex-ante and ex-post evaluations of tax incentives?
- To what degree do tax incentives effectively stimulate investment, employment, and economic growth in the LAC region?
- Do the benefits attributable to the tax incentive outweigh the costs?

Following the formulation of the research questions, search strategies were developed to identify studies for inclusion in this report. The search strategies used a combination of subject headings and keywords for the concepts related to the impact of tax incentives and applied them across the most prominent databases to ensure more excellent coverage of the topic.

The Web of Science, Scopus, and Business Source Complete were initially utilized to search for peer-reviewed articles. These databases contain some of the world's largest electronic collections of academic sources with searchable cited references. Furthermore, to ensure comprehensive coverage of high-impact literature, Google Scholar was combined with the Publish or Perish tool to explore the most frequently cited papers in the field of tax incentives.

Then clear inclusion and exclusion criteria were developed to screen research results and to identify relevant studies. These criteria are:

- Content that aligns with the research questions defined a priori; in this context, the screening phase aims at identifying the literature that helps to define, explicitly or implicitly, the research perspectives and methodologies employed regarding investment tax incentives within the LAC region and in other countries.
- Published over a sufficiently long period to encompass the various types and methodologies applied in the analysis of tax-related incentives. The selected period, between 2000 and 2024, is defined based on the evolution of tax incentives in public policy and international economic agendas.
- Whose referential framework is limited to the empirical evidence on the impact of tax incentives on economic outcomes, such as GDP growth, investment levels, employment, and productivity.
- Written in English, due to its general recognition as an international academic language as well as in Spanish and Portuguese.
- Refers to scholarly, peer-reviewed literature and credible documentation from international organizations that are accessible online and available without restrictions.

2.2 Sample collection and selection method

The process of research and selection of materials involved the adoption of a system of filters, which, by considering the most relevant variables for our analysis, allows us to define the final sample that must be evaluated and discussed. We used Rayyan as management software to assemble the materials and carry out the initial screening; thereafter, a more detailed analysis was conducted. For the data collection procedures, we queried the selected electronic databases using the following keywords, selected based on the potential contribution that the words could make to the literature analysis:

1. Effectiveness of Tax Incentives;
2. Effectiveness of Fiscal Incentives;
3. Tax Expenditures;
4. Promoting Foreign Direct Investment;
5. Business Tax Incentives;
6. Export Promotion Incentives;
7. Employment incentives;
8. Sector-specific incentives;
9. Methodologies for Evaluating Tax Incentives.

By using truncation in the search terms to capture different variants of the relevant keywords and applying the Boolean operators “AND” and “OR” to combine the terms, we determined the main keywords to be searched in the database. In particular, the research within the Scopus database was carried out using the "Article title, Abstract, Keywords" criterion; in WoS and BSC, the research was linked to the "Topic", while all available materials were selected within Google Scholar. Furthermore, automatic screening is directly implemented during the research phase in various databases and consistently conducted in line with the defined exclusion criteria.

The first search results yielded 3,918 documents identified from Scopus, 2,061 from WoS, 684 from BSC, and 500 most cited papers from Google Scholar. To make the database complete and inclusive, additional materials related to the topics covered by this work were gathered from “ProQuest Dissertations & Theses Global” and the repositories of the international organizations. From these search strings, a combined total of 9,399 documents were identified across all databases, as detailed in Table 4.

Table 4 Tax Incentives: Data Collection per Database.

Database/Source	Search string	Results
Web of Science	Topic (TS)	2061
Scopus	TITLE-ABS-KEY	3918
Business Source Complete (BSC)	TI TITLE + TX ALL TEXT	684
ProQuest Dissertations & Theses Global	Document Title - TITLE	96
National Bureau of Economic Research	All FIELDS	395
International Monetary Fund	All FIELDS	251
World Bank	All FIELDS	242
Organization for Economic Co-operation and Development (OECD)	All FIELDS	182
International Finance Corporation (IFC)	All FIELDS	5
Inter-American Development Bank	All FIELDS	42
Latin America and the Caribbean (via Lens.org)	All FIELDS	1023
Google Scholar	All FIELDS (Via Publish or Perish Software)	500
Total References Imported		**9,399**

To enhance the efficiency of the systematic review process, all identified records were exported to Rayyan as RIS (Research Information System Format). A total of 5,284 duplicates were identified and resolved automatically. After the exclusion of 2,642 duplicates in all databases, 6,757 articles remain which were subsequently screened for titles and abstracts to ensure their alignment with the defined theme, thereby excluding irrelevant articles. Based on this level of screening, 727 documents met the selection standards in LAC and other countries all over the world. Figure 1

summarizes the data collection and selection process led through standardized PRISMA techniques (Page et al., 2021; Moher et al., 2009).

Due to the large database obtained at the initial screening level, a further screening step was carried out to narrow the geographical scope of the database concentrating specifically on research related to experiences in the Latin America and the Caribbean (LAC) countries. Furthermore, the primary focus of this study is to survey the literature specifically addressing tax incentives designed for stimulating investment and economic growth as well as creating jobs. Consequently, tax incentives aimed at other objectives such as fostering innovation and R&D activities, promoting charitable giving, encouraging environmental practices, advancing social welfare, or improving housing availability are excluded.[2]

At the conclusion of this process, the database consists of 54 papers focused on the analysis of tax incentives for investment in LAC countries. The full-text screening was performed on the remaining papers to determine their relevance. The body of the text of each study was analyzed to ensure that the information provided by the authors would assist with the discussion and interpretation stages. This required a review of the context of all papers following the inclusion criteria.

Of these 54 studies; 31 studies that are empirical, applying quantitative models, focusing on the LAC countries, and have significant contributions to the topic were selected for the discussion and interpretation stages.[3] The list of included articles is presented in Annex A which summarizes the results and methodologies used in these empirical studies.

[2] While the literature on research and development (R&D) tax incentives falls outside the scope of this study, we find it helpful to touch on this literature briefly, as policies associated with this body of work have been prominent in the debate on tax incentives in recent years. Section 3.4 presents a brief review of three selected papers discussing the impact of R&D tax incentives in some LAC countries.

[3] It is worth mentioning that the total number of references discussed in this report goes beyond the 31 papers included directly in the systematic review. In the discussion of various concepts, we have incorporated insights from an additional 30 scholarly works, including foundational studies, investor surveys, and international survey papers (e.g., De Mooij & Ederveen, 2003, which synthesized findings from 25 empirical studies, and Feld & Heckemeyer, 2009, which synthesized findings from 46 empirical studies). This ensures that the conclusions drawn in this report are based on a comprehensive and diverse range of literature.

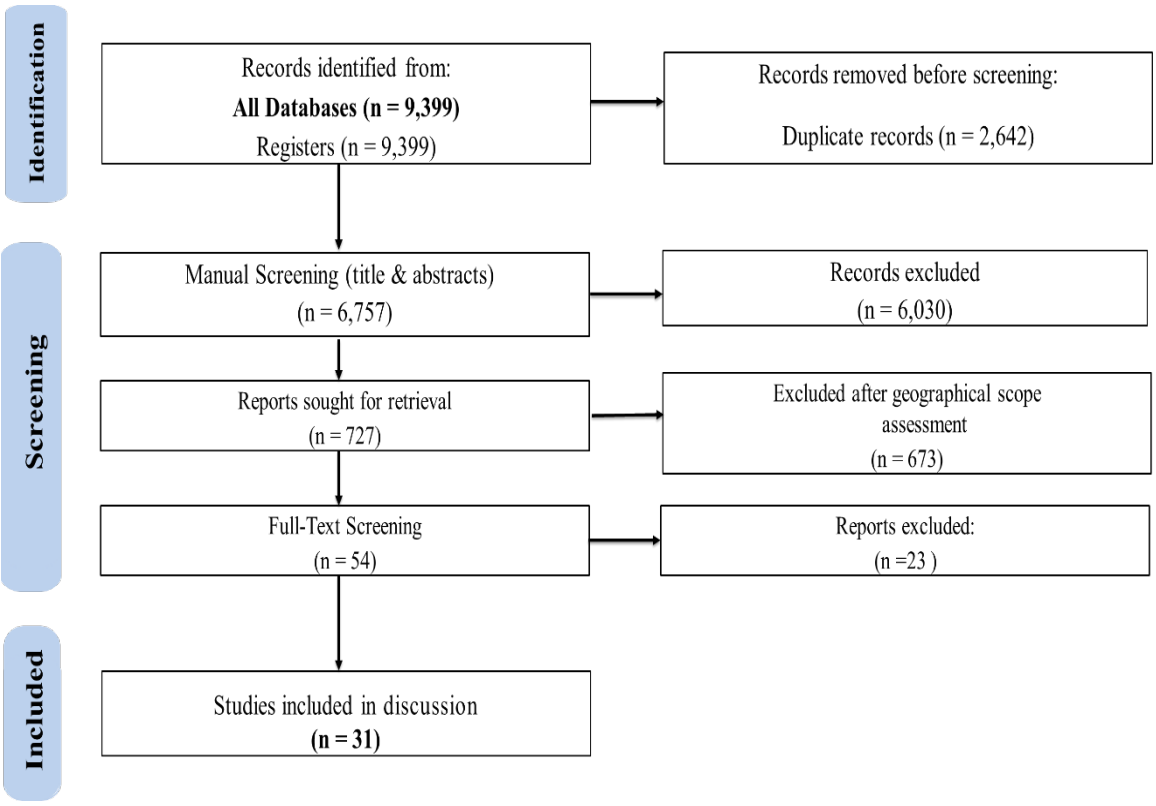

Figure 1 PRISMA Flow Diagram

2.2.1 The Sample and its Salient Characteristics

After having defined the sample, a descriptive analysis of the collected materials was conducted to provide an overall overview of the documents through a set of variables:

- Geographic analysis.
- Types of tax incentives analyzed.
- Methods of evaluation of the impact of tax incentives and the types of evaluation (ex-ante/ex-post).

- **Geographic Analysis**

With respect to the geographic analysis, Table 5 shows that the existing literature includes nine cross-country analyses. This way, broader trends spanning several countries can be observed. Brazil, Colombia, and the Dominican Republic are at the top as far as the citations are concerned, each being mentioned in four different works, while Chile and Ecuador have appeared with three citations each to their names. The studies that center on Argentina, Costa Rica, Mexico, and Uruguay are referred to just once only in the analyzed sample.

Table 5 Distribution of the Literature Based on Countries

Country / Region	Count
LAC/Caribbean Countries (Cross-country analysis)	9
Brazil	4
Colombia	4
Dominican Republic (DR)	4
Chile	3
Ecuador	3
Argentina	1
Costa Rica	1
Mexico	1
Uruguay	1
Total Studies	**31**

- **Types of Tax Incentives Analyzed**

The analysis of the typical types of tax incentives shows that more than half of the sample is focused on the evaluation of the effects of tax holidays and the reduction of corporate income tax as illustrated in Figure 2. Import duty exemptions and investment tax credits have been investigated five times, while investment allowances three times. Accelerated depreciation and R&D credits have been examined two times. Other forms of tax incentives were analyzed once each.[4]

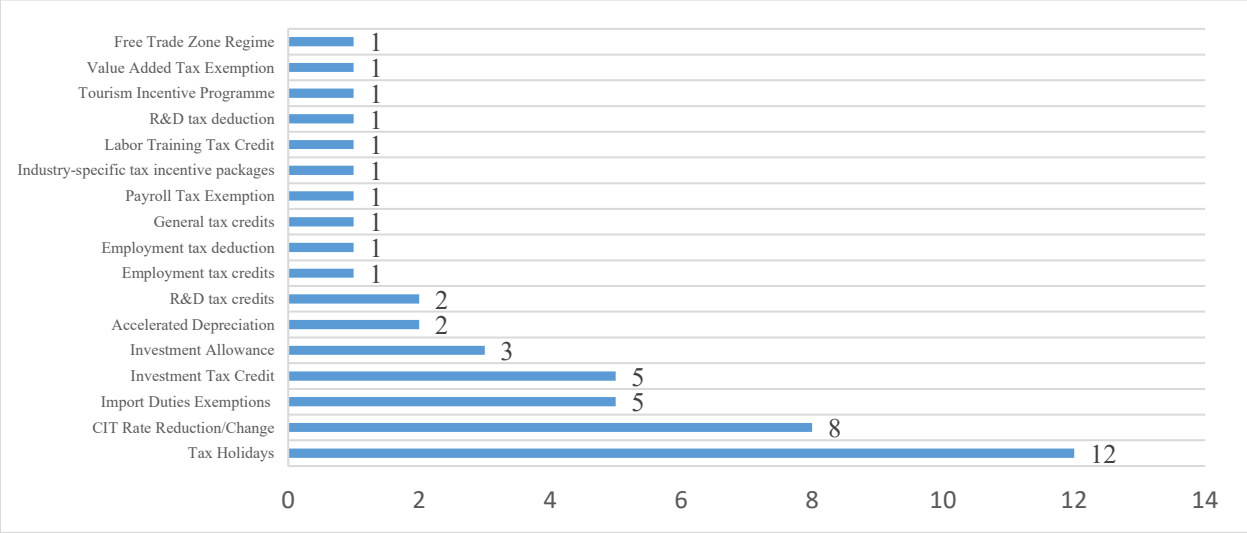

Figure 2 Types of Tax Incentives Analyzed

[4] Some studies analyze multiple types of tax incentives within the same paper.

- **Methods of Evaluation of the Impact of Tax Incentives**

Figure 3 gives a range of methods for measuring the impact of different types of tax incentives. Econometric techniques are the main ones used, as evidenced by 19 out of 31 cases in the sample. The econometric evaluations usually concentrate on the direct effect of changes in tax incentive policies on the country's or company's economic activity, one example being investment growth due to a reduction in the effective tax rate. The econometric literature on evaluation contains several econometric methods such as regression models, multiple linear regression, fixed effects models, generalized methods of moments (GMM), difference-in-difference approach, matching method, regression discontinuity, seemingly unrelated regressions, and dynamic panel data techniques.

The cost-benefit analysis method focuses on the net economic impact by comparing the costs caused by the application of tax incentives (e.g., tax revenue loss) and benefits (e.g., additional investment or employment). This method ranks second and appears in 5 documents in the sample analyzed in this study. Structural models such as computable general equilibrium (CGE) and dynamic computable general equilibrium (DCGE) models, were utilized 5 times. Other methods, such as simulation models, comparative assessments, and financial analysis have been employed only once each.

This distribution suggests that there is a dominant approach emphasizing the application of econometric models in tax incentive evaluation, while the other methods are comparatively less represented in the research sample. On the one hand, the high number of these studies points out the degree of effectiveness tax incentives have in terms of achieving their desired objectives in increasing sectoral activities, while, on the other hand, the cost-efficiency and overall economic viability have been rarely studied. The restricted use of cost-benefit analysis indicates a significant gap in the adoption of a comprehensive evaluation framework that enables quantification of the net economic benefit (or cost) of introducing tax incentives.

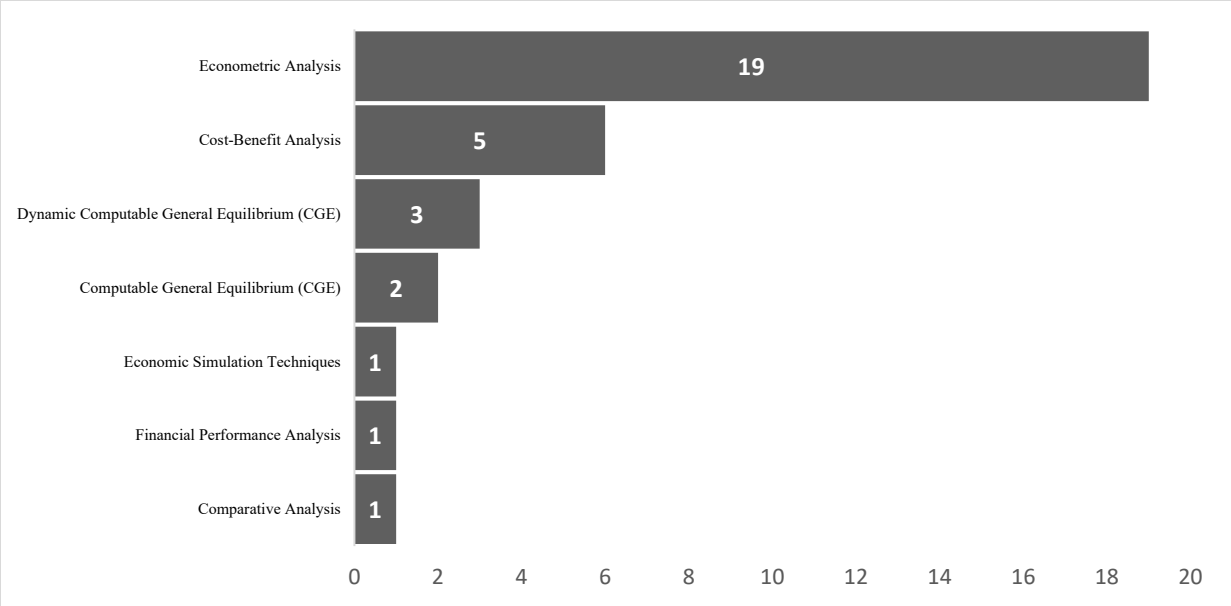

Figure 3 Type of Analysis

Regarding the type of analysis used in the evaluation of tax incentives, the figure below shows that most studies reviewed (87 percent) have applied a post-introduction (ex-post) evaluation. Whereas only four studies (13 percent) of the sample of 31 studies used the ex-ante method that takes place before the introduction of tax incentives.

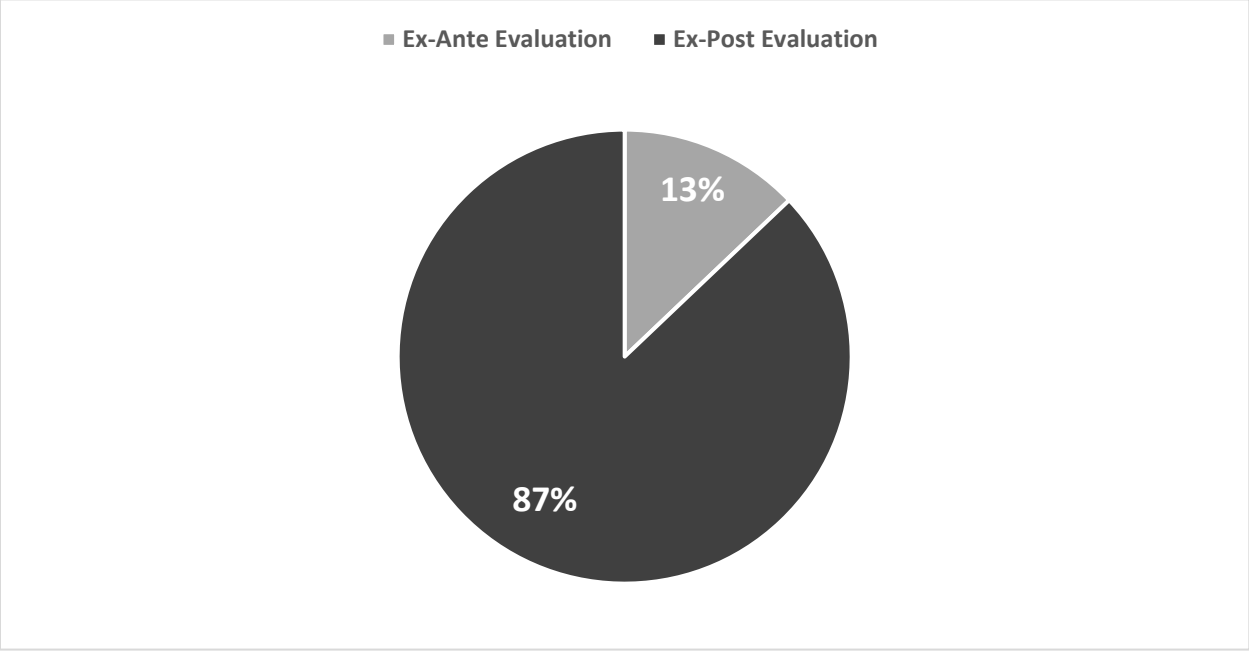

Figure 4 Type of Evaluation

The lack of ex-ante evaluations on the topic of tax incentives highlights a notable deficiency within the current literature. This deficiency can be ascribed to the deficit of skills in cost-benefit analysis

and applied economic welfare analysis. Unlike evaluations conducted post-implementation that evaluate results after a policy is put into effect, ex-ante evaluations offer distinct value by examining the possible impacts of tax incentives on investments before they are put into action. Having the ability to model investment outcomes is crucial for making informed decisions since it enables policymakers to simulate scenarios effectively to reduce negative consequences and maximize the advantages of tax incentives. For instance, conducting an ex-ante evaluation can indicate when the incentive may lead to tax revenue losses without generating the necessary incentives that would lead decision-makers to make increases in investment. This insight can help governments adjust or even revamp the policy altogether. This becomes particularly important in industries where incentives could potentially focus on investments that would have happened anyway making the tax benefits unnecessary and costly.

3 Literature Review on the Impact of Tax Incentives

Studies use various approaches and data from both developed and developing countries addressing the question of how important tax incentives are in explaining investment and other economic outcomes, with mixed results reflecting the complexity of their effects. Despite the potential benefits, the use of tax incentives usually comes with significant and sometimes overlooked costs (Klemm & Van Parys, 2012). This section provides an overview of the empirical literature assessing the impact of tax incentives on investment and other economic variables.

Corporate tax incentives are frequently used as policy instruments aimed at fostering investment, which in turn is expected to drive economic growth, and boost employment. The underlying rationale is that, through changes in the corporate income tax (CIT) via temporary exemptions (tax holidays) or simply by the reduction of the CIT rate, an investment could be incentivized, with additional investment being made in a sector there is the potential to boost economic performance and generating employment. The employment effect would be realized when the effect of the lower cost of capital creates an increase in the demand for the output of the sector that in turn increases the demand for labor by more the substitution effect of replacing labor in production with the now cheaper incentivized capital.

The effects of tax incentives are inconclusive globally. Applying regression and other quantitative methods as well as investor motivation survey studies on the topic yield uncertain conclusions

owing to different reasons such as the research methodologies applied, the scope of analysis, the variety of variables examined, and the analysis periods. It is often challenging to determine if the impacts caused by the tax incentives introduced are only owing to the use of these incentives or if other factors such as the change in other public policies or macroeconomic variables, might also affect the results.

The choice of tax variables can also be problematic since the true effective tax rate in a country depends on complex interactions between statutory rates, depreciation regimes, loss-carry forward provisions, inflation, and other variables. Nonetheless, a few preliminary conclusions regarding tax incentives can be made from this literature. Overall, the evidence indicates that changes in tax policies may have an important impact on drawing investment into a specific sector, especially foreign investment.

3.1 The Impact of Tax Incentives on Foreign Direct Investment (FDI)

The central theme in the empirical studies is the measurement of the impact of tax incentives in boosting the inflows of foreign direct investments as well as aggregate investment. Results in the literature reveal complex dynamics of employing tax policies to stimulate the economy. Some studies suggest that tax incentives can indeed affect investment decisions significantly, particularly in relation to FDI. However, others highlight constraints associated with this approach in less developed nations where factors, like institutional frameworks and data accuracy pose hurdles.

First, there is more general literature on the sensitivity of FDI to taxation. This literature addressing the question of whether taxes affect foreign direct investment has found a significant effect, but uncertainty about its size remains. The articles by Hines (1999), Hassett and Hubbard (2002), De Mooij and Ederveen (2003), and Feld and Heckemeyer (2009) provide a good analysis of the existing empirical evidence regarding the relationship between corporate tax rates and FDI.

Hines (1999) reviewed US literature and indicated that sizable literature is devoted to measuring behavioral responses to international tax rules, finding that tax rate differences have an impact on the location and scope of foreign investment. He suggests a consensus estimate of a tax elasticity of FDI (based on the findings of much of the literature) between 0.5 and 0.6, i.e., a 1 percent higher tax rate leads to a reduction in inward FDI by 0.5 to 0.6 percent, implying that high tax rates may generate tax revenue at the cost of considerable loss of foreign investment.

In their work about the effectiveness of tax policy, particularly tax incentives, in promoting investment, Hassett and Hubbard (2002) provide a good review of the literature. Based on firm-level data, the results reveal that investment can be reduced between 0.5 and 1 percent, corresponding to a 1 percent increase in the user cost of capital. Furthermore, macroeconomic data does not provide proof of the impact of tax policies on investments. This ambiguity is due to macroeconomic data errors, inter-asset reallocation of capital, and the issue of simultaneity, which complicates establishing a clear causal relationship or making correct attributions using these data. Additionally, investment incentives tend to focus on equipment, creating inter-asset distortions between types of capital, which can lead to attracting weaker investment. Hence it is crucial to consider the efficiency costs associated with investment incentives.

De Mooij and Ederveen (2003) and Feld and Heckemeyer (2009) carried out meta-analytical methods aggregating the outcomes of several econometric studies focusing on the impact of company taxation on FDI. With a special focus on developed countries, De Mooij and Ederveen (2003) constructed a meta-sample from 25 different empirical studies in order to quantify the relationship between corporate tax rates and FDI flows by computing the tax rate elasticity. They found that FDI is remarkably elastic in relation to tax rates, estimating a median value of the tax rate elasticity of foreign capital in the literature is around −3.3. This indicates that a one percent rise in the tax rate might result in a 3.3 percent drop in investment (FDI) showing a strong and negative correlation between tax rates and investment inflows. Feld and Heckemeyer (2009) expanded the meta-analysis by including 21 studies for a total of 46 studies. The findings confirm that FDI remains highly responsive to tax rates; however, the elasticity is slightly lower than previously calculated elasticity in the study of De Mooij and Ederveen (2003), with a range between -1.39 to -1.68. These findings underscore the role tax policies play in influencing investment choices, especially in developed nations.

Most of the 46 empirical studies analyzed in Feld and Heckemeyer (2009) are dominated by literature in developed countries, with only a few studies focusing on examining the tax rate effects on FDI in developing nations. This glaring gap in research is largely attributed to the limited availability of microdata in many developing countries. Consequently, although tax is recognized as being an important factor in the decisions of foreign investors, it is imperative to understand

that this conclusion is based on elasticities derived from empirical evidence that predominantly stems from developed countries, especially the United States.

In the case of developing countries, Agostini and Jalile (2009) carried out an empirical analysis to estimate the magnitude of the effects of corporate income tax rates on FDI in Latin American countries.[5] The estimates were made by adapting a Logit model and using panel data for foreign investment made in eleven Latin American countries by thirty countries during the period 1990-2002.[6] The results show that foreign investment does respond to changes in corporate income tax rates with a one percentage point increase in the corporate income tax rate associated with a decrease of between 0.75 percent and 0.96 percent in the proportion of FDI that a country receives. In addition, they highlight that good infrastructure and institutional quality are important determinants of the share of FDI that a country receives in Latin America indicating that governments should consider other types of public policies aimed at attracting foreign investment.

Sosa (2006) adopted the marginal effective tax rates (METRs) approach to analyze the impact of tax incentives, particularly through tax holidays on investment decisions in Eastern Caribbean Currency Union (ECCU) countries, considering two sectors (tourism and manufacturing) for two types of assets (machinery and buildings). The findings indicate that METRs in the case of companies that benefit from a tax holiday are substantially lower than those without such a concession. However, while these tax holidays cause a substantial reduction of METRs, this incentive in some cases is offered on a discretionary basis, therefore it would cause an inefficient allocation of resources due to distortions across incentivized investments and those not benefited from the concession. Therefore, the research advocates considering an alternative incentive scheme consisting of a lower corporate income tax rate and an initial depreciation allowance to obtain a similar reduction in the METRs. Furthermore, the study indicates that there is a small

[5] The LAC countries used in the sample are Argentina, Bolivia, Brazil, Colombia, Costa Rica, Chile, Ecuador, Mexico, Paraguay, Peru and Venezuela.

[6] The countries of the origin of FDI considered in the study are: Argentina, Australia, Bahamas, Belgium, Bermuda, Brazil, British Virgin Islands, Canada, Cayman Islands, Chile, Colombia, Denmark, England, Finland, France, Germany, Italy, Japan, Luxembourg, Mexico, Netherlands, Netherlands Antilles, Panama, Portugal, Spain, Sweden, Switzerland, United States, Uruguay and Venezuela.

dispersion of the size of METRs across sectors and across assets, which implies that both the intersectoral and cross-asset distortions are not of substantial magnitude.

In addition, Cubbedu et al., (2008) have approached the question of the impact of tax incentives in the Caribbean region. Using different estimation techniques, they analyzed whether tax policies and tax incentives can help explain FDI flows in 15 Caribbean countries for the period from 1990 and 2004. The study indicates that statutory CIT rates are found to have an impact on FDI with a 1 percentage point reduction in statutory tax rates leading to about 0.6 percent in inbound FDI as a share of GDP, on average. To better capture the effect of tax incentives, the analysis was extended by estimating the marginal effective tax rates (METRs) on foreign investments and finding that METRs have a much smaller impact on FDI.

While the study found that tax incentives have some effect on FDI, other factors such as institutional quality, infrastructure development, and FDI restrictions are also important determinants of FDI flows. This suggests that there are limits to the role that tax incentives and, more generally, tax policy can play in attracting FDI. Instead, improving the economic and institutional environment, particularly the quality of institutions, upgraded infrastructure, and transparency would appear to be more promising avenues to foster foreign investment inflows and economic development. Furthermore, the authors emphasized that even if taxes play a role in attracting FDI, decisions about tax incentives should be based on whether the benefits to the economy and society from the higher investment levels outweigh their costs.

Another study for the Caribbean suggests that tax incentives have played a limited role in attracting FDI. Using a panel sample of six Eastern Caribbean Currency Union (ECCU) countries for the period 1990– 2003, Chai and Goyal (2008) find that the benefits of tax incentives, in terms of increased FDI, are far outweighed by the tax revenues forgone from import-related tax incentives and corporate income tax holidays, estimated in the range of 9.5 percent to 16 percent of GDP per year for the ECCU countries. The results also confirm the importance of lower statutory CIT rates, the absence of FDI restrictions, and better institutional quality as key factors for raising FDI.

Van Parys and James (2010a) evaluate the impact of tax incentives on stimulating FDI in the tourism industry within countries of the Eastern Caribbean Currency Union (ECCU) over the period 1997-2007. The authors apply the approach of Difference-in-Differences to determine how

effective treatment of the expansion of income tax exemptions for tourism firms from 5 to 25 years was in inducing increased FDI of Antigua and Barbuda by comparing the period before and after the change took place in 2003. Other ECCU countries are the control group because they are fairly homogeneous and, therefore, their incentive regimes remain invariant, and they also keep control over other factors that may affect FDI in tourism. This study reveals that after the reallocation of tourism-specific tax incentives in 2003, FDI in Antigua and Barbuda's tourism sector rose far above the FDI for the other six ECCU countries because of changes in tourism tax incentives.

Despite its growing use, tax incentives alone have not been especially successful in attracting investments, especially FDI. Other econometric evidence shows that tax incentives constitute only one of the factors that can affect investment given that there are other elements external to the tax system that have proven to be more relevant, such as the quality of institutions, infrastructure, market size, and economic, political and social stability, among others. Hence, studies find that taxes are generally not the most important factor affecting investment. For example, in a study of 45 countries, Wei (2000) finds that reducing the level of corruption from that of Mexico to that of Singapore would have approximately the same effect on inward foreign investment as a reduction in the marginal corporate tax of 50 percentage points.

The success of incentives in attracting FDI depends strongly on country-level characteristics. For countries with bad investment climates, it is ineffective to lower the tax rate to compensate for that. Instead, these countries should focus on building capacities and creating conditions that improve the investment climate (Bellak, Leibrecht, and Damijan 2009; Kinda 2014; Van Parys & James, 2010b). According to James (2014), although lowering effective tax rates helps boost foreign direct investment, the effect is eight times stronger for countries with good investment climates, which helps explain why incentives have encouraged investment in some countries yet failed in others.

Similarly, surveys of investors have generally found that the tax system is significantly less important than a country’s basic economic and institutional environment. An earlier survey carried

out by Wunder (2001), finds that in a survey of seventy-five Fortune 500 companies, only four identify tax factors as being the most important variable in their investment decisions.[7]

Another survey conducted by the Multilateral Investment Guarantee Agency (MIGA) in 2002 of 191 companies with plans to expand operations overseas found that only 18 percent in manufacturing and 9 percent in services considered grants and incentives to be influential in their choice of location.

In like manner, a survey of 159 multinational firms operating in the Caribbean conducted by the World Bank's Foreign Investor Advisory Service (FIAS) in 2004 showed that fiscal incentives did not rank among the most important factors in their overseas investment-location decisions, and they were surpassed by factors such as the availability of telecommunications services, power supply, political stability, a favorable attitude toward FDI, and labor productivity. According to the World Bank (2005), firms generally make their investment location decisions in a two-stage process, and tax differences may remain important at the second stage when comparing shortlisted locations after the fundamentals have been deemed appropriate at the first stage.[8]

Based on a survey of 750 multinational investors and business executives, The Global Investment Competitiveness (GIC) survey (2017/2018) shows that political stability, along with the presence of a stable legal and regulatory environment in the country, and market size are generally considered more important by investors than tax rates and incentives. These findings are consistent with previous survey results on the subject (UNIDO, 2011). The report also points out that investment incentives can help attract FDI, but they generally only work when investors hesitate between choosing similar sites that they can use as a new base for their exports. When investments are motivated by the desire to access a domestic market or to extract natural resources, incentives are often ineffective.

A survey report on foreign investors in ten middle-income countries done by Kusek et al., (2020) also finds that many factors influence investor decisions. Tax incentives are among the factors

[7] The Fortune 500 is an annual ranking of the top 500 United States corporations as measured by gross revenue. The list is compiled and published annually by Fortune magazine.

[8] According to the Wrold Bank study, the fundamentals include of the match between country-specific conditions and the investment, the overall investment climate, and the availability and cost o f key factors of production, labor, infrastructure.

influencing investors, but government transparency, investment protection guarantees, and ease of establishing a business all rank higher in importance. Some types of investments are more responsive to tax incentives. The survey finds that influence on the investment decisions of companies is more relevant in those cases where companies are on the margin (efficiency-seeking), which would relate to competitive, labor-intensive activities.

Efficiency-seeking FDI is observed to concentrate in a small number of successful host countries whereas market and natural resource-seeking FDI are more widely distributed across geographical regions. This clustering pattern is consistent with the nature of efficiency-seeking FDI, which is highly mobile and driven by firms strategically organizing their value chains by locating in cost-competitive host countries. Depending on the industry, it means that countries must compete for efficiency-seeking FDI and not all of them win. On the other hand, market and natural resource–seeking FDI, by their intrinsic nature, must go where the market or natural resource is located and are thus more geographically dispersed. (Kusek, P., and A. Silva. 2018).

Within this scope, one of the earlier findings of the literature is that the impact of tax rates on investment decisions is generally higher for export-oriented companies than those seeking the domestic market or location-specific advantages. Surveys show that managers of these firms tend to respond more favorably to tax incentives (Reuber (1973) and Guisinger (1985)). Mutti and Grubert (2004) confirm that the multinational corporation's investment geared toward export markets, rather than the domestic market, is particularly sensitive to host country taxation. Also, this sensitivity appears to be greater in developing countries than in developed countries.

This finding is not surprising because exporters prioritize cost efficiency to maintain competitiveness in international markets, making them highly responsive to incentives that reduce operational expenses. In contrast, investors focused on domestic markets may not prioritize such incentives, as their market dynamics and competitive pressures differ. In domestic markets most if not all corporation income taxes can be passed on to final consumers through higher prices. This is not an option for exporters from any single country that is competing in the international market. (James, 2014).

Moreover, these manufacturing exporting firms are often highly mobile, and more likely to compare taxes across alternative locations (Wells 1986). Hence, taxes can be an important part of their cost structure, and the firms can easily move to take advantage of more favorable tax regimes.

As per these insights, studies disclosed a greater effect of tax incentives on location decisions of greenfield foreign investments (Hebous, Ruf, and Weichenrieder 2010), and vertically integrated FDI (Overesch and Wamser 2009). All these firm characteristics are consistent with efficiency-seeking behavior. Thus, the literature generally confirms that efficiency-seeking FDI is more responsive to tax incentives.

3.2 The Impact of Tax Incentives on Foreign and Aggregate Investment

Although the empirical analyses have focused largely on measuring the effect of the corporate tax rate on foreign investment, the impact of tax incentives on general investment has not received as much attention, particularly in developing countries where studies are still limited and the overall conclusion from them is that tax incentives are often ineffectual at the aggregate level.

3.2.1 Cross-Country Studies

To examine whether tax incentives are an effective tool for stimulating investment in developing countries, Klemm and Van Parys (2012), constructed a panel dataset from 1985–2004 over 40 Latin American, Caribbean, and African countries to evaluate the use of tax incentives as a tax competition tool, as well as the effectiveness of corporate tax rates and tax incentives in attracting investment. They found evidence of cross-country tax competition and an impact on FDI through lower corporate income tax rates (a 10-percentage point increase in the income tax rate reduces investment by 0.5 percentage points of GDP) and longer tax holidays (a 10-year extension increases investment by 1% of GDP), while investment tax credits and deductions (allowances) seem to not affect the FDI inflows. Regarding the impact of these incentives on total investment, none of the four types of tax incentives seems to be effective in stimulating gross private fixed capital formation or boosting economic growth suggesting that FDI crowds out other investments. This is particularly the case if FDI simply involves a change of ownership rather than a new net investment entering the country.

In another cross-country study, Stausholm (2017) utilizes a panel dataset comprising 51 developing countries across Latin America, Asia, Africa, and the Caribbean, covering the period from 1985 to

2014. The study analyzed the impact of tax holidays and decreasing tax rates on different indicators of economic outcomes including net FDI inflows, private investment (as measured by gross fixed capital formation), and GDP growth, as well as public finance. The results are in line with Klemm and Van Parys (2012) indicating that while overall FDI might increase as an effect of tax incentives, the level of capital in the economy is not affected. Furthermore, there are no significant results when looking at the correlation between tax incentives with GDP growth and total factor productivity growth. In terms of public finance, implementing a tax holiday has a statistically significant negative effect on tax revenues in developing countries because it can shrink the tax base. The correlation indicates that introducing a tax holiday will decrease tax revenue by 0.70 percentage points as a percentage of GDP.[9]

Abbas and Klemm (2013) discuss the changes in the structure of corporate income taxes in 50 emerging and developing economies (11 from the LAC region) during the years 1996-2007. The particular emphasis is on how such effective tax rates (considering the special regimes, tax exemptions, and tax rate reductions) affect not only domestic investment but also foreign direct investment (FDI) flows. The findings reveal that effective average tax rates (EATRs) exhibit a significant negative correlation with both aggregate private investment and FDI, whereas effective marginal tax rates (EMTRs) do not exert any influence on aggregate private investment. Evidence of a "partial race to the bottom" in corporate taxation is observed in those countries that strategically reduce taxes on mobile capital through special regimes while keeping rates on other investments higher.

3.2.2 Within-Country Studies

3.2.2.1 Brazil

Regazzini et al. (2021) applied a static interregional computable general equilibrium (CGE) model to compare the economic and social effects of tax exemption policies (lowering tax rates) targeting the Brazilian automotive industry in 2009 with those that could have targeted the agriculture sector

[9] In regions other than LAC, Van Parys and James (2010c) investigated the effectiveness of tax incentives on investment (using FDI and private gross fixed capital formation as a share of GDP as dependent variables) in 12 CFA Franc countries (in West and Central Africa) over the period 1994–2006 corresponding to the period after the devaluation of the CFA Franc. The study employs a dynamic fixed effects panel data analysis in order to control for both year-specific and country-specific variations. The result shows that changes in tax holidays for regular investment projects did not have an effect on FDI inflows or fixed capital formation. However, there is a tendency for investments made by exporting companies to be positively affected by tax holidays.

in the same year. The results show that lowering taxes on agricultural products can be considered superior to the same reduction applied to vehicles, in terms of its effects on the main economic variables analyzed containing income, household consumption, employment, and GDP especially when considered at the regional level. The authors highlight the importance of prioritizing the agriculture sector in future tax relief policies since tax reliefs for this sector produce much better economic results than cutting taxes for the automotive sector.

Using a difference-in-differences methodology, Garsous and Velasco (2015) assess the effect of the fiscal incentives program put in place by the federal authorities in Brazil in 2002. The program included a series of tax incentives and aimed to develop the tourism industry by increasing investment and employment in the undeveloped region in the Northeast of Brazil. The analysis provides evidence that the tax credits to tourism firms have increased municipal employment in the tourism sector by about 34 percent. According to the authors, in 2009, approximately one job out of four was the result of this fiscal policy. For the sector, this corresponds to an employment growth of 84 percent higher than what would have occurred in the absence of the program. In addition, other findings suggest that this job creation was not the result of either displacement effect or job destruction in neighboring municipalities that could not benefit from the tax incentives. However, the authors do raise concerns over the efficiency of this policy as the employment creation through the 75 percent tax credit offered to firms is large and its marginal cost in terms of foregone revenues might be higher than its marginal benefit in terms of job creation.

Porsse *et al*. (2007) applied the computable general equilibrium (CGE) model to assess the economic effects of regional tax incentive programs aimed at attracting new investment in the economies of two Brazilian regions (the State of Rio Grande do Sul and the Rest of Brazil). The analysis of these incentives focuses on aspects such as employment, household welfare, GDP, and the change in tax revenue collection induced by new investment.

The results showed that the region implementing such incentive programs has a positive effect on employment resulting from an increase in demand generated by new investments. The household welfare of consumers is also positively affected, driven by the decrease in the price of final consumer goods and by the increase in household disposable income due to the positive impact on

primary factors income. Nevertheless, the effect on real GDP is negative and this would occur mainly because of the specialized pattern of production in the region. Regarding the effects on the public finances of regional and federal governments, the net result on the indirect tax revenue is positive due to the increase in the tax base, even considering the tax revenue relief offered by the regional government to thoroughly finance the increase in private investments.

A more recent study that utilized a dynamic computable general equilibrium (DCGE) model was conducted by Porsse, A., and Carvalho, S. (2019). The study aims to evaluate the economic impacts of the payroll tax exemption policy that was instituted in 2012 and expanded in the following years in terms of sectoral scope, as well as to evaluate the impacts of changes in the payroll tax exemption policy carried out in 2015 by the Federal Government to reduce the level of exemptions. The justification of the changes is based on the conclusion that the policy produced distortions as not all sectors were covered by the law, the distribution of tax relief was uneven across sectors, and the policy would benefit labor-intensive sectors more than capital-intensive sectors. Considering a baseline scenario for the period 2013–2025, the results show that the exemption policy would imply a cumulative growth impact of 0,34% in GDP, while the new policy leads to a cumulative economic loss of 0,37%. According to the authors, these findings can be explained by the sectoral distortions resulting from the changes in the exemption policy which increases the cost of payroll in capital-intensive sectors as well as in the production cost of these goods, leading to reductions in the aggregated investment rate.

3.2.2.2 Colombia

Aiming at promoting investment, a tax stimulus policy was introduced in Colombia in 2003 by which firms were allowed to deduct 30 percent of investment in fixed assets from taxable income during the period 2004- 2007). To explore the effectiveness of the policy in question, Galindo and Meléndez (2010) conducted a formal evaluation using a yearly dataset of plant-level investment in Colombian firms during the period 1997 to 2007. The study found that investment increased significantly after the tax stimulus was adopted with a firm in a sector that claimed the benefit having an investment rate 3.5 percentage points higher than a firm in a sector that did not claim the benefit. However, when the overall economic conditions are controlled for, the impact of the tax policy is eliminated, indicating that the tax reduction policy implemented in Colombia since

2003 has not promoted investment and the rise of investment is instead explained by countrywide or regional factors.

García-García et al. (2023) assessed the effectiveness of four certain fiscal incentives, namely, investment allowance, accelerated depreciation, as well as customs duties, and VAT exemptions on the financial feasibility of microgrid projects in Colombia. Based on a financial model, this study compares the key financial indicators such as NPV and IRR, calculated from cash flows with and without incentives. The results indicate that tax incentives improve the prospective feasibility of microgrid projects significantly and that the most important incentives are the accelerated depreciation and VAT exemptions, subsequent are the investment deductions and customs duty exemptions.

3.2.2.3 Dominican Republic

Amendola et al. (2023) investigated the national and regional effects of corporate income tax exemption on the performance of Dominican firms by using economic and financial indicators capable of expressing the value created by the firms. To this end, the authors have implemented a propensity score matching method and used data from tax returns provided by the local fiscal authority. The panel data comprise administrative CIT declarations by more than 18,000 firms distributed across 31 provinces from 2006 to 2015. The results showed that the corporate income tax exemption had a positive effect on growth and on most performance indicators, while they did not affect profitability. However, the regional analysis highlighted some significant differences in terms of performance between the geographical areas within the Dominican Republic. This investigation powerfully highlights the critical importance of acknowledging local contexts when assessing the repercussions of fiscal policies on business results.

3.2.2.4 Ecuador

Mogro (2023) evaluates the impact of a tax incentive program introduced by the Ecuadorian government on formal employment and business investment. Using a difference-in-differences strategy, the author compares the different types of investment created in the prioritized sectors vs. non-prioritized sectors before and after the implementation of the new law enacted in August 2018, particularly focusing on temporary exemptions and reductions in the corporate income tax (CIT) rate. The results clearly show that fiscal incentives, by themselves, do not have a significant effect

on private investment or formal employment for prioritized sectors compared to non-prioritized sectors over the last quarter of 2018 and 2019. The author also indicates that other important factors stop the decision to invest in Ecuador, such as corruption, quality of institutions, country risk, inequalities, country size, and ease of doing business.

Using financial information obtained from the companies' financial statements and applying a multiple regression model, Córdova-León et al. (2022) analyzed the impact of tax incentives on the financial performance of trade and manufacturing firms in Ecuador from 2015-2018. The research indicates that applying tax incentives has improved the economic performance of the companies that involve them. These firms enjoy better financial positions due to a lower tax burden, which encourages investment. However, this positive impact can be fostered by improving other factors such as political, economic, and legal conditions that result in an environment conducive to business activity.

3.2.2.5 Mexico

Utilizing a dynamic computable general equilibrium model, Feltenstein and Shah (1995) examined the impact of certain tax incentives on private investment in Mexico, including general and industry-specific tax credits, employment tax credits, and corporate rate reductions.[10] The findings show that the incentive offered by the corporate income tax rate reduction lowers the cost of capital but does not increase the cost of borrowing, as did the investment tax credits. In addition, the CIT reduction brings about lower inflation rates and lower losses in foreign reserves than do the investment tax credits. Accordingly, reductions to the corporate income tax rate are more effective in stimulating investment than investment tax credits.

3.3 Cost-Benefit Analysis Studies

While tax incentives are often designed to stimulate investment, their use should be predicated on the belief that the benefits to the economy that can be expected from an increase (if any) in the incentive-favored activities would outweigh the total costs of the tax incentives granted. In general, tax incentives generate significant costs; they distort investment between economic sectors or

[10] This is the only study included despite falling outside the timeframe of the systematic review due to its unique focus on the general equilibrium analysis of investment incentives in Mexico, addressing a gap in the empirical studies literature analyzing the impact of tax incentives in Mexico.

types of investment, they reduce tax revenue which, if it must be compensated, increases the distortions generated by other taxes, they increase the costs of administration and oversight of the tax system and they produce social costs of corruption and rent-seeking (Zee, Stostky and Ley, 2002).

In the context of developing countries including those in the LAC region, despite the widespread use of such incentives, there is a notable absence of a systematic evaluation regarding both the benefits and the costs associated with the tax incentives that are implemented, leaving a critical gap in understanding their actual impact. Therefore, it is imperative to undertake a proper assessment, given that the nature of the incentives employed in developing countries markedly differs from those utilized in developed nations.

The few research studies that utilize cost-benefit analyses in LAC, including Chile, Costa Rica, Ecuador, and the Dominican Republic, demonstrate that tax incentives might not deliver the efficacy that policymakers presume. For instance, investigations conducted by Agostini and Jorratt (2013), Monge-González and Rivera (2022), Jorratt (2010), Chen, Harris, and Zolt (2018), and Mele (2017) reveal that only a few countries have evaluated the efficiency of their tax incentives in meeting economic objectives. While incentives may achieve their purpose, this must be balanced against the costs associated with them. Where studies have been conducted, they often conclude that the economic costs, such as lost taxes and increased administrative burden, outweigh the benefits; hence, the efficiency question related to the overall value for money of the incentives becomes crucial.

This section discusses the studies by Agostini and Jorratt (2013), Jorratt (2010), Chen, Harris, and Zolt (2018). The studies by Mele (2017) and Monge-González and Rivera (2022) which focus on the impact of tax incentives implemented in special zones are presented in section 3.5.

In Chile, Agostini and Jorratt (2013) analyze two investment incentives: the exemption of tariffs on capital goods imports and income tax credit for purchases of fixed assets. The justification for State intervention is related to the existence of some positive externality influencing the country's economic growth by increasing investment in capital goods.

The effectiveness of tariff exemptions is estimated based on information from import records and shows that the reduction of tariffs to zero rate increases capital goods imports significantly. Regarding the benefit generated by the incentive and the comparison with its costs (i.e. loss of revenue, greater loopholes for tax evasion, increase in the administrative and control costs of the system), an evaluation was done on the increase in imported capital goods in relation to the loss of revenue, with the former being higher by approximately US$ 184 million. However, the authors warn that this does not necessarily translate into a positive impact, since not all imported capital goods have a positive impact on economic growth and not all potential costs have been estimated. Finally, they conclude that there are better instruments that can be used to increase investment, such as instantaneous depreciation and the exclusion of the payment of interest as an expense for the purposes of calculating the tax base.

Regarding credit for purchases of new fixed assets, the authors estimate the additional investment resulting from this incentive based on the corporate income tax returns, which is about four times lower than the estimated cost. They also stress that this treatment would have a negative impact on income distribution since it is highly concentrated in the high-income population. Finally, they recommend replacing this incentive with a more accelerated depreciation regime than the current one or implementing certain improvements in the design of this credit incentive. The proposed improvements to the tax credit include eliminating the limit but restricting it to Small and Medium-Sized Enterprises (SMEs), and granting the tax credit only for investments exceeding depreciation plus GDP growth.

In Jorratt (2010), the CBA was applied to evaluate three tax incentives in Ecuador namely, deduction for net increase in jobs, reduced rate for reinvestment of profits, and deferral for accelerated depreciation. Based on information from the sworn declarations, the study analyses the use of incentives by size and economic sector of the companies and compares the behavior of the companies that take advantage of the incentive with that of the companies with tax losses that have not been able to use the incentive.

In the case of the deduction for net job increases, it uses the expenditure on wages as a proxy for the hiring of workers and concludes that the incentive is not aligned with the objectives of the 2007-2010 National Development Plan (PND) because it is not focused on small and medium-

sized companies or strategic sectors. Furthermore, it is not cost-effective, since its benefit is practically equal to the fiscal cost, so it proposes replacing the incentive with adequate training of the workforce.

Regarding the evaluation of the reduced rate on reinvested profits, it concludes that it is also not aligned with the PND since 90% of the fiscal cost goes to the benefit of large companies. Its effectiveness is low since only about 1.4% of companies use the incentive and it is not cost-effective (negative net benefit). It also highlights the disadvantage of benefiting only investments financed with retained earnings and encouraging the postponement of investments to wait for profits and take advantage of the benefit.

Regarding the deferral for accelerated depreciation, it also shows that it is not per the objectives of the PND and that its effectiveness is limited by the treatment of losses from prior periods. Therefore, it proposes repealing the reduced rate for reinvestment of profits and modifying the accelerated depreciation system, designing a depreciation acceleration regime that allows for faster rates than the current ones, which effectively allows the deferral of the tax and is focused on smaller companies and strategic sectors.

Another study conducted by Chen, Harris, and Zolt (2018) executed a comprehensive cost-benefit analysis (CBA) of the Tourism Incentive Program for Tourism (TIPT) allocated to the tourism sector in the Dominican Republic during the timeframe spanning from 2002 to 2015. The analysis elucidates that the tourism sector within this nation is predominantly influenced by global economic variables, and tax incentives do not constitute a significant determinant in its expansion and progression. The benefits attributable to incentives encompass tourism investments, their impact on GDP, and the prospective tax revenues generated by such additional investments, whereas the costs comprise the loss of tax revenues, the adverse effects on GDP, and the inefficiencies stemming from the misallocation of investments. The research posits that the costs surpass the benefits, leading to the conclusion that these incentives have not been an efficient tax instrument. Ultimately, it argues that if the forgone revenue had been allocated to public infrastructure, there would be a net gain in GDP and the benefits would outweigh the costs, and therefore holds the view that this type of investment is a more cost-effective fiscal instrument to support tourism and economic growth. The findings of this research are intended to guide

policymakers in refining the design and implementation of tax incentives to maximize their economic impact.

3.4 R&D Studies

Three studies focusing on the effectiveness of R&D tax incentives in three LAC countries namely, Argentina, Chile, and Colombia

For Argentina, Crespi et al. (2016) investigate the effectiveness of Argentina's R&D+i tax incentive policy implemented since 1998, focusing on its impact on firm-level innovation investments. The study employs dynamic panel data methods, particularly System GMM estimation, and examines data from two rounds of Argentina's National Innovation Surveys (ENIT). The findings clearly show that the tax credit policy significantly boosts private sector investment in research and development (R&D) and innovation, with a noticeably stronger impact on capital goods investments (exhibiting elasticity greater than 1) compared to pure R&D investments (where elasticity is below 1), hinting at a possible crowding-out effect on R&D activities. Evidently, larger firms and those in low-tech sectors are the primary beneficiaries of these incentives, as large firms are evidently more responsive than SMEs. The study underscores the necessity for policy measures that specifically target balanced support for both capital goods and R&D investments, which are, of course, essential for sustained innovation.

In the specific case of Chile, Mardones and Becerra (2020) analyzed the impact of the R&D tax incentive law on innovative inputs using data from the 9th Innovation Survey conducted in 2013 and 2014 and applying differences in differences (DID) and matching with differences in differences (MDID) techniques. The study concludes that the tax incentive does not increase the total expenditure on innovation. Although the Law had some positive effects on fostering innovation, the overall results were modest. When firms that are already familiar with the law are considered, there is no positive effect on overall innovation spending. This study highlights the urgent need to reform R&D tax incentives in Chile to make them more effective.

In Colombia as well, the effectiveness of R&D tax incentives in stimulating investment in the manufacturing sector was examined by Mercer-Blackman (2008), with a particular focus on whether these measures increase investment in science and technology. Using a comprehensive data set of tax incentive applications for R&D, special research, and the manufacturing survey

from 2000 to 2002, the study uses a seemingly unrelated Zellner regression method to estimate the effect of tax incentives. The results show that despite the high elasticity of demand for R&D investments, especially in SMEs, current tax incentives cannot sufficiently stimulate R&D efforts to the desired extent. The study points to the need to improve policies to better focus on companies that will benefit the most and thus increase the impact on innovation.

3.5 The Impacts of Location-Specific Tax Incentives

The impact of location-targeted tax incentives such as those implemented in Special Economic Zones (SEZs) has been the subject of a limited focus of investigation in developing countries. These SEZs provide a bundle of benefits wherein tax incentives traditionally form the backbone and are often considered key for SEZ success to attract foreign direct investment (FDI) and stimulate economic growth, however, their effectiveness and consequences are debated.

Frick and Rodriguez (2023) provide a good summary of empirical research on the effectiveness of tax incentives in SEZs in developing countries. They stress that the evidence is mixed. While certain studies suggest that these incentives are important for the success of SEZs, other research shows that there is no significant correlation between tax incentives and SEZ performance, especially in low-income countries. Farole (2011) finds no link between tax exemptions and the efficacy of SEZs, whereas Frick et al. (2019) illustrate that fiscal incentives are only associated with SEZ performance in higher-income developing countries. Ciżkowicz et al. (2021) affirm that variations in tax incentives among Polish SEZs do not significantly influence their attractiveness. The Asian Development Bank (ADB) (2015) suggests that, while countries feel compelled to offer generous tax incentives, their effectiveness in attracting investment is well below that of other factors in SEZ policies. Older studies have, however, a more positive view of fiscal incentives and underline their role in SEZ development (Aggarwal, 2005; Rolfe et al., 2004).

According to Frick and Rodriguez (2023), the effectiveness of tax incentives in SEZs is complex and depends on certain conditions. According to their research, tax exemptions and other fiscal incentives are widely included in special economic zone policies in developing countries, but have little effect on attracting foreign direct investment. Investors expect such incentives, viewing them as a standard aspect rather than a pivotal factor. Although incentives can influence the choice of a particular SEZ within the country they do not independently attract investment. These results show

that although tax incentives play an important role, they are not enough to influence investment choices. On the other hand, other key elements to attract investment are industrial infrastructure, strategic location, and political support. To attract investment effectively, the study emphasizes the need to develop a comprehensive strategy that includes these elements and is adapted to the specificities of the SEZs.

Based on a sample of the reviewed literature, six studies concentrate on analyzing the effects of various types of location-specific tax incentives in the Dominican Republic, Costa Rica, El Salvador, and Colombia.[11]

An econometric analysis of the efficacy of tax incentives in export-free zones in El Salvador, the Dominican Republic, and Costa Rica was carried out by Artana (2015). The study evaluated the effect of these incentives on firm performance using data from company income tax returns. Overall, the empirical data indicates that these incentives are ineffective because SEZs frequently have no influence on exports, job creation, economic growth, or drawing in foreign direct investment. For example, in Costa Rica, the results of the analysis of both aggregate and microdata show that exemptions from import duties and corporate income tax did not have a favorable impact on employment or investment in the export-free zones. This inefficiency most likely results from the fact that some extremely profitable ventures would have come to fruition without such tax breaks. The author proposes a more neutral incentive structure that rewards continuous investments.

The results also show that companies that benefited from tax benefits in El Salvador's free zones did not outperform non-beneficiary companies in terms of sales growth, much like Costa Rica did. The findings cast doubt on the efficacy of the current fiscal policies by implying that reform is required to produce more effective fiscal policies and that the incentives may not be well targeted.

Unlike the other two countries, fiscal incentives seem to lead to better performance of the firms in the Dominican Republic, with firms in free zones managing to achieve higher sales growth and increased labor intensity. While these incentives are claimed to have had positive effects at the firm level, however, their actual contribution to broader economic growth remains questionable.

[11] Two of these studies apply cost-benefit analysis (CBA) to evaluate the efficiency of tax incentives.

Maximizing the benefits of these incentives requires more focused policies targeting strategic sectors.

Jenkins and Kuo (2017) analyzed the economic effects of removing the corporate income tax (CIT) exemption in the Dominican Republic's free trade zones (FTZs) using a simulation model. The results indicate that removing this incentive could place a rather significant burden on low-waged workers, estimated to be about ten times the additional CIT revenue collected. This suggests a substantial negative effect on the lower-income group of the workforce. Furthermore, the study concludes that this policy shift may conveniently result in significant real income gains for the wealthier segments of society.

Utilizing a dynamic computable general equilibrium (DCGE) model, Moller et al. (2012) conducted an assessment of tax expenditures in Colombia, focusing on the effectiveness and fiscal impacts of various types of tax incentives, including the Free Trade Zones regime (RZF). The study concludes that although the RZF creates a moderate amount of employment and investment, much of this would likely occur even without tax incentives. Additionally, the RZF incurs a fiscal cost of 0.1% of GDP, with estimates suggesting this might rise to 0.33% by 2020. Given that businesses in free trade zones enjoy lower tax rates compared to those operating under the regular tax framework, this naturally leads to horizontal inequality. The findings underscore the pressing necessity for more equitable economic policies that could potentially reduce disparities and enhance the effectiveness of tax incentives.

Mele (2017) applies a CBA to evaluate the efficiency of tax incentives in stimulating investment and creating jobs specifically in Special Economic Zones (SEZs) in the Dominican Republic which enjoy comprehensive and widespread tax exemptions. The study analyzes the net benefits of tax incentives granted to firms by comparing the investment and employment benefits generated by the tax incentive system against their cost in terms of forgone revenue. The analysis highlights that, although companies within SEZs create three times more jobs than companies outside the free zones, the fiscal cost of using tax incentives to create new jobs appears to be higher in SEZs. Each job created within SEZs costs five times as much in terms of forgone revenue as each job created under the standard tax regime. These results seem to indicate that the Dominican Republic’s tax incentives are not an efficient means of promoting employment growth, especially

in SEZs, and that other public investment alternatives could have better results. This study underscores the importance of considering all the costs associated with these incentives when assessing their long-term viability and effectiveness.

Monge-González and Rivera (2022) compare the amount of positive externalities that arise from the FDI operating under the regime of free trade zones (FTZ) in Costa Rica and costs associated with tax incentives provided to investments made by multinational corporations (MNCs) operating within the FTZs. The positive externalities in the study represent the aggregate intangible benefits in terms of productivity gains of domestic suppliers that engage with MNCs (through greater efficiency) as well as higher wage premium received by workers employed by MNCs operating in the FTZs. The study estimates that these positive externalities are between 1.5 and 2.3 times greater than the costs associated with tax incentives offered during the period from 2010 to 2017.

4 Key Takeaways from International Experiences

4.1.1 Strategic Trade Policies Over Income Tax Incentives

It is important to highlight that whatever type of tax incentive is chosen, its fundamental objective is to divert resources from other parts of the economy to the sectors or regions that receive preferential treatment. Thus, the fundamental question is how cost-effective are such investment tax incentives. Contrary to the popular belief that income tax incentives and subsidized finance policies are important policies for bringing about rapid industrialization, Jenkins and Kuo (2007) found that trade and macroeconomic policies have had a much greater impact than tax and subsidy policies in Taiwan. For example, the strategic use of tax exemptions for imported inputs used for export has significantly reduced production costs and improved the international competitiveness of the Taiwanese industry.

Such insights from Taiwan's strategy can guide the structuring of trade policies in other contexts, ensuring that they not only stimulate economic growth and industrial development but also maintain fairness and administrative simplicity. By adopting these proven strategies—considering local economic conditions and industrial goals—policymakers can craft policies that drive sustainable development. Box 1 offers insights into Taiwan's experience with tax incentives and export promotion.

Box 1

Taiwan's Experience with Tax Incentives and Export Promotion

Taiwan is considered by many policymakers as one of the models of economic growth for developing countries. During the period 1955-95, Taiwan has transformed its economy. To promote its industrial development the government of Taiwan implemented a variety of fiscal incentives, along with the movements of key macroeconomic variables. Over this period tax incentives were a popular policy instrument to attempt to influence the allocation of investment towards exporting industries.

To evaluate the relative impact of tax incentives and other economic variables on the rate of return on equity, Jenkins and Kuo (2007) constructed a detailed financial model of the cash flow profile of a typical firm from each sector and calculated the net present value (NPV) of an investment. The financial models of the investment and operation of these firms enable them to integrate a wide range of tax and tariff measures, as well as the movement of the real exchange rate, real wages, and real interest rates. These models allowed them to estimate the impact of these fiscal and economic variables on the financial profitability of the sector.

The results show that the duty drawback and duty exemption programs are by far the most important policy measures for exporting firms. Another popular incentive policy for export promotion is to subsidize the interest rate on export investment finance. The results indicate that its actual impact on the overall rate of return on industrial activity was marginal.

This analysis points to the government's favorable trade policies, and the rapid cutting of production costs by entrepreneurs that enabled exporting industries to expand while labor was enjoying a rapid increase in real wages. In terms of macroeconomic policies, the government ran a fiscal surplus each year during this period. This enables the banks to have ready funding for worthwhile private-sector investments. Such funding enabled the firms to aggressively cut production costs. These factors were much more important than the income tax incentives or financial subsidy policies for Taiwan's achievement of a rapid pace of industrialization during the four decades covered by this study.

4.1.2 Supporting Export-Oriented Firms

In estimations of the amount of tax expenditures in an economy, the tax exemptions given to export processing zones or duty exemptions for capital and intermediate inputs are sometimes included in the total tax expenditures. In an accounting sense, they can be viewed as preferential taxation for export-oriented enterprises. However, in terms of sound economic policy, many of these tax preferences are desirable and consistent with sound economic policy.

To enhance the competitiveness of export-oriented firms, it is essential to implement tax policies that reduce production costs. Duty exemptions on imported inputs such as machinery, raw materials, and intermediate goods are critical. These exemptions lower the financial burden on producers, allowing them to maintain competitive pricing in international markets. For instance, Taiwan's fiscal policy has successfully employed carefully monitored duty exemptions on inputs, significantly reducing production costs and boosting export performance. By adopting similar measures, countries can encourage higher production volumes and enhance the competitiveness of their export sector.

Providing VAT refunds on inputs used for export production can substantially reduce the overall tax burden. This policy creates a more favorable economic environment for exporters, enabling them to thrive in global markets.

Infrastructure development incentives are also vital for supporting export-oriented firms. Establishing export processing zones (EPZs) that are largely free of taxation of both inputs as well as income taxes can create an environment conducive to industrial growth by freeing firms both from the burden of taxation and from bureaucratic customs and tax administration systems.

However, it is important to acknowledge that EPZs are costly to build and maintain. Therefore, a sustainable approach involves eventually developing an information and systems control mechanism to allow inputs to flow to firms tax-free without the need for extensive physical infrastructure. This approach not only reduces costs but also ensures efficient and streamlined operations for export-oriented firms. Encouraging the establishment of EPZs, alongside implementing advanced control mechanisms, will attract foreign direct investment, foster the development of a local industrial base, create employment opportunities, and promote skills development.

While it might appear that the export sector that is not subject to taxation is not contributing any tax revenue to the country, however, because such firms contribute foreign exchange to the economy there is an indirect source of taxation that can be very substantial. When additional foreign exchange becomes available to the banking system, it can be exchanged with local currency to import goods. These imports are subject to both tariffs and value-added taxes that enhance the government's revenue collections. This premium is known as the Foreign Exchange

Premium (FEP) and has been quantified for many countries. The concept of FEP is explored in greater detail in the next section.

By combining tax policies that reduce production costs with infrastructure development incentives, countries can create a dynamic and competitive export sector. This comprehensive approach will enable the country to integrate more effectively into the global economy, drive sustained economic growth, and create an important source of indirect tax revenues.

5 Guidelines for the Appraisal of Tax Incentives Introduced into the Corporate Income Tax

The impact of tax incentives can vary significantly across sectors and types of investment. Therefore, to determine whether a tax incentive will be efficient, a case-by-case financial performance analysis can help policymakers assess if tax incentives are necessary to attract the targeted sector.

Financial performance analysis uses firm-level data to conduct a micro-simulation of the effect of all incentives on investor returns. According to Kronfol & Steenbergen (2020), this approach is the most robust compared to regression analysis and investor motivation surveys.

This approach relies on the premise that tax incentives are considered effective if they allow a company to become profitable when it would be otherwise unprofitable without tax incentives. Financial profitability is defined as exceeding a minimum return to investment benchmark or the "hurdle rate" related to the investment. Tax incentives are considered redundant, meaning that the incentive was not ultimately influential in the investor's marginal decision, if a firm is sufficiently profitable in the absence of the tax incentives. Firms whose returns remain below the identified hurdle rate even with incentives, or above it even without incentives, are also less likely to be affected in their investment decision by incentives. (Kronfol, & Steenbergen, 2020).

The conclusions drawn from the financial analysis are to be used in an economic cost-benefit analysis to find out the economic efficiency of tax incentives. The financial cost-benefit analysis considers the possibility of investment from the viewpoint of the investors of the activity, whereas the economic cost-benefit analysis checks the net impact of the project on the whole economy. The economic appraisal assesses if the economic benefits brought about by the incentivized investment

for the economy are higher than the economic costs that are needed for the expansion of this sector. The economic cost of such an incentive must include both the cost of the resources that the incentive draws into the activity plus the costs of the tax administration required to issue and monitor the incentive. The additional compliance costs (commonly known as lobbying or rent-seeking) that the private sector will engage in to be selected for such an incentive are also economic resource costs.

This Section briefly presents a cost-benefit framework to evaluate the fiscal, financial, and economic impact of tax incentives on different stakeholders. It focuses on providing a set of guidelines for considering tax incentives that are designed to benefit corporations. It primarily proposes an ex-ante appraisal of tax incentives that are designed to either (i) reduce the taxable income, (ii) reduce the rate of tax applied to the taxable income of corporations, or (iii) provide tax credits that are given to reduce the amount of taxes to be paid to the government.

5.1 Goals of Corporate Income Tax Incentives

Corporation income tax incentives are mainly designed to achieve one or more of the following goals;

- The corporate income tax incentive is designed to reduce the tax burden on a potential private investment that is under consideration by a foreign corporation that is producing an internationally tradable good for export. The reduction in the tax liability on corporate profits will increase the after-tax returns of these investments making them more attractive than they would be without the corporate tax incentives. Usually, the incentive is given with the hope that the additional investment will also result in an increase in employment.
- The income tax incentive is designed to reduce the tax burden on a potential private investment that is under consideration by a domestic corporation that is producing an import substitution good. The reduction in the tax liability on corporate profits will increase the after-tax returns of these investments, making them more attractive than they would be without corporate tax incentives. Usually, the incentive is given with the hope that the additional investment will also result in an increase in employment.
- The income tax incentive is to induce the private sector to assist the government in achieving a particular policy target to overcome a market imperfection. Examples of such

goals might be to increase the production of renewable energy or to increase the employment of a type of labor that is in some way disadvantaged.

5.2 Quantifying the Impact of a Tax Incentive on the Behavior of the Firm and its Economic Value

Cost-benefit analysis (CBA) is the most reliable analytical tool to evaluate tax incentives' fiscal, financial, and economic impact on different stakeholders. These costs and benefits are expressed in monetary units.

To undertake an evaluation of such an incentive, one needs to set up a financial/economic model of the investment under consideration. The model can be built using Excel spreadsheets and will include all the financial variables associated with this project. The objective of the analysis is to determine the impact of the given tax incentive on the financial attractiveness of the investment as measured by the financial net present value of the project or the financial internal rate of return. If data is not available for the project under consideration, then the information on a similar project can be used and adjusted accordingly to each country's context.

The model should include all the variables that will affect the financial and economic outcomes of the project. This will include, in addition to the corporate income tax variables, all tariffs and VAT on material inputs, outputs, and capital investments. Such data is usually readily available and can be obtained from potential investors in the sector. Using this analytical model, one can find out the impact of each of the tax policy variables, including the discretionary incentive under examination, on the net present value of the project and its financial and economic rate of return.

In the case of attracting foreign investments in manufacturing activities that are being marketed abroad, a tax incentive that raises the rate of return on the investment will, in the long term, be reflected in the real wages of workers in the country. Incentivizing such export-oriented activities tends to both create employment and raise the wages of workers across all sectors of the economy.

Incentives that are focused on attracting investment into import-competing activities tend also to create additional employment or achieve another policy goal. The question to answer is how cost-effective the program is in terms of its economic cost and the outcomes expected from the incentive.

This analysis is undertaken in five steps:

- First, a firm is selected in a sector that policymakers have identified as potentially worthy of receiving a tax incentive (a tax expenditure is to be directed to the activity).
- Second, an analysis is done to quantify the direct fiscal cost of the tax expenditure required to accommodate the tax incentive. This proposal does not quantify the additional tax administration costs or compliance costs.
- Third, an analysis is then carried out to determine the likely impact of the tax expenditure on the financial profitability of the sector being incentivized.
- Fourth, to the degree that the tax incentive increases the financial profitability of the activity, an expansion of this activity may occur. An economic appraisal is done to measure if the economic benefits produced by the expansion of this activity for the economy are greater than the economic resource costs required to expand the activity in this sector.
- Finally, an analysis is carried out to show how the burden of the tax incentives (tax expenditure) is shared among the stakeholders.

5.3 The Integrated Investment Appraisal Methodology for the CBA of Corporate Tax Incentives

The following sub-section explains in detail each of the components of an integrated cost-benefit analysis (CBA).

5.3.1 Financial Analysis

The financial analysis aims to estimate each applicable incentive's potential financial value to the targeted enterprises. It determines the likely impact of this tax expenditure on the financial profitability of the investment being incentivized. This appraisal is the initial stage of the integrated analysis of the tax incentives.

5.3.1.1 Financial Cash-Flow Model

A detailed financial cash flow model is built for each representative firm. This model represents the average value of the investment, production, sales, operating inputs, and other variables that are part of the firm's production activities. In calculating the firm's tax liability, the project assets are depreciated using the straight-line depreciation method.

The financial models of the investment and operation of these firms enable us to quantitatively measure the impact of each of the selected tax incentives on the financial profitability of the firm by estimating the difference in financial profitability indicators (internal rate of return and net present values) between "without incentive" and "with incentives" scenarios.

5.3.1.2 Financial Model Analysis Indicators

The impact on the profitability of the potentially incentivized investment can be measured using the project's net present value (NPV), which equals the present value of the net operating benefits of the project less the present value of the investment costs of the project, less the present value of all taxes paid (including corporate income tax) on the operating income, plus the present value of the residual values of the project assets.

Another metric used in measuring the return on investment is the project's financial net of tax internal rate of return (IRR). It is represented as a percentage rather than as a monetary value. The financial discount rate (or the target rate of return of the firm) is a real rate expressed net of inflation.

An activity expansion will not occur unless the tax incentive raises the financial profitability sufficiently to induce private investors to want to increase the level of activity. Depending on the design of the tax incentive, there may be a fiscal cost but not necessarily an economic impact. For example, a tax incentive might be given to promote an investment that would have been undertaken anyway. This will happen if the incentive does not provide a large enough increase in profitability to include an expansion of the activity beyond what was already planned. Hence, there is a fiscal cost but no economic benefit or resource cost. This is simply a financial transfer from the government to the lucky recipient. Alternatively, if the incentive does increase the profitability in the sector and the incentive is designed to only go to the investor if an incremental expansion of the activity takes place, then there will be a net fiscal cost. However, if the incentive leads to an expansion of the activity, this does not mean that the incentive has a positive economic impact. It might mean that the incentive causes an economically inefficient activity to expand and, thus, hurts the economy.

5.3.2 Economic Analysis

The financial cost-benefit analysis examines the potential investment from the perspective of the owners of the activity, while the economic cost-benefit analysis measures the net impact of the project on the entire economy. The economic appraisal measures if the economic benefits produced by the incentivized investment for the economy are greater than the economic resource costs required to expand the activity in this sector.

When representative firms produce tradable goods, the economic estimation of tradable output or input is done in two stages. The first stage is adjusting the financial cost of the import or export of the goods for any market distortions, e.g., tariffs, taxes, subsidies, and other distortions that may exist in the market. Secondly, there is an adjustment because the economic value of the foreign exchange produced or used by this activity might be different from its financial or market value. This adjustment expressed as a percentage of its market value is known as the foreign exchange premium (Kuo, 2011). The foreign exchange premium (FEP) is the rate of indirect taxes that accrues to the government due to expenditures that can be made with the use of foreign exchange earned by the project. When applied to the border values (CIF or FOB) expressed in foreign exchange units of tradable goods, this adjustment yields values that reflect their true economic value or cost at the border. The concept of FEP is further elaborated in Box 2.

In the case of non-tradable goods (goods and services produced and sold in the domestic market), their financial values or costs are usually distorted because of the imposition of taxes and/or subsidies. The financial prices need to be adjusted to arrive at the economic values or costs of the non-tradable goods.

Furthermore, as the project operating cost also includes labor, to estimate the economic opportunity cost of labor (EOCL), the financial wage must be adjusted for any distortion (personal income taxes, social security contributions, etc.). The EOCL is a critical calculation in project evaluation because it determines the value of the labor externality (LE) associated with a project (Jenkins et al., 2019).

Box 2

Foreign Exchange Premium

- When a project demands foreign exchange, it exerts pressure on the domestic currency to depreciate. As a result of the depreciation of the local currency, imports will become more expensive and some importers will react by cutting back their demand for imported goods. Exporters, now receiving more pesos per unit of foreign currency, will increase their supply of exports. The project's demand for foreign exchange will be partly met by a cutback in demand for foreign exchange by importers and partly by additional supply of foreign exchange by exporters. Following **Harberger's** postulates, the economic value of foreign exchange will be a weighted average of the value of foreign exchange given up by importers and the value of resources used to generate the additional exports.

- Since the demand for imported goods is generally distorted by import tariffs and perhaps by quotas, and the supply of exports is distorted by export taxes and subsidies, a difference is found between the economic price of foreign exchange ($\boldsymbol{E^e}$) and its market price ($\boldsymbol{E^m}$). This difference represents the loss of import tariff revenues and quota rents associated with forgone imports; as well as losses or gains due to the distortions associated with the additional production of exports.

- The difference between financial and economic exchange rates also reflects losses in indirect tax revenues in both traded and non-traded sectors. The depreciation in domestic currency resulting from the project's demand for foreign exchange leads other importers to cut back their demand for foreign exchange. Consequently, the domestic indirect taxes associated with the goods and services that are no longer imported are forgone. On the supply side, the resources required to produce additional exports have to come from the nontraded sector, which will reduce the supply and, due to price change, the corresponding quantity demanded for non-traded goods and services. The associated value-added tax (VAT) and other indirect tax revenues on these non traded goods and services will also be reduced. All these losses in trade and other indirect tax revenues have to be accounted for when estimating the foreign exchange premium (FEP).

- The same conceptual framework will also hold when a project generates foreign exchange (but in reverse). When a project exports, the supply of foreign exchange increases which results in the appreciation of the domestic currency (less local currency per unit of foreign currency). The cheaper foreign currency results in an increase in imports as well as a cutback in exports by some exporters. The economic value of the foreign exchange generated by the project will be estimated as a weighted average of the value of the new imports and the value of resources that were used for producing exports and are now saved. A gain is achieved in import and indirect tax revenues due to additional imports. Also, the resources that are no longer used to produce exports will be largely diverted to the non-traded sector where they will generate indirect tax revenues.

- If all distortions on tradable goods are either taxes or subsidies, then the economic value of the foreign exchange generated by the project will be estimated as:

$$E^e = E^m + Net\ Fiscal\ Impact$$

- The percentage by which E^e exceeds E^m is referred to as the foreign exchange premium (FEP);

$$\text{FEP} = \left[\left(\frac{E^e}{E^m}\right) - 1\right].$$

- When $\boldsymbol{E^e > E^m}$, then the foreign exchange premium is positive.

5.3.2.1 Economic Resource-Flow Model

The economic resource flow statement is constructed with the economic benefits and costs of the project. These economic benefits and costs are derived by simply multiplying the financial receipts or costs by their corresponding economic conversion factors. The economic opportunity cost of capital (economic discount rate) is used in this part of the analysis.

5.3.3 Stakeholder Analysis

The stakeholder analysis is conducted to identify the groups that benefit from these incentives and those that bear the cost. It demonstrates the movement of tax revenue from the government to the targeted enterprises and vice versa. The government's fiscal cost (tax expenditure) is a crucial stakeholder impact.

5.3.3.1 Identification of Externalities

The difference between the financial and economic value of each project's inputs or outputs represents a benefit or a cost to a party other than the financial sponsors (Jenkins, 1999). The sum of the present value of all the externalities generated by the project is derived by subtracting the present value of the financial net cash flow from the present value of the economic net benefits using the same discount rate (economic opportunity cost of capital). It is also important to know the tax incentives' net impact on each of the affected stakeholders.

In each of these analyses, the government has a trade-off between the revenue cost of the tax expenditure to the government and the benefits that the group may receive from this intervention.

Annex C provides an application of CBA of the selected tax incentives to specific sectors. The impact of the selected tax incentives is carried out on two representative firms, the first firm is selected from the textile sector (an export-oriented firm exporting cotton yarn), and the second firm is selected from the plastic products sector (an import-substitution firm producing PVC pipes).

6 Conclusions

The corporate income tax systems in Latin America and the indirect tax system to a lesser degree, contain a wide variety of tax incentives (see Appendix B). Many countries have designed tax incentives to create employment opportunities by attracting foreign investment or by expanding the quantity of investment in particular activities or sectors. Research and Development has been one of the primarily activities that has been targeted for promotion by countries in the Latin American region.

The tourism sector is a sector that has often benefited from special tax treatment. Furthermore, less developed regions of a country are often given preferential tax treatment as are free trade or export processing zones designed to both create employment and boost the foreign exchange earnings of a country. A large body of research articles has been prepared to attempt to evaluate on an ex-post basis the impact of many of these tax incentives. Very few studies have been published that report on ex-ante analysis of tax incentives. The findings of the ex-post empirical studies are quite mixed. Usually for every study that finds that the income tax incentive causes an expansion of investment or economic activity in the target activity in one country, there are one or more studies that find little or no response elsewhere from the tax incentive. Most of these studies are econometric in nature.

What appears to be clear from the analysis is that any array of tax incentives is usually not sufficient to attract foreign investors. The investment decision is usually made on the fundamental financial attractiveness of the activity, the availability of the needed labor skills, the risk associated with the country, and the quality of the infrastructure.

Tax incentives in the form of income tax holidays or low rates combined with indirect tax exemptions are generally necessary to attract investments into export processing zones. Often these tax provisions are treated as tax expenditures while in fact, this is usually not the case. The exporting activities generate foreign exchange earnings through the purchase of local labor and other inputs. This incremental foreign exchange allows for incremental imports to be purchased by consumers and businesses. These additional imports will usually be subject to a higher than average tax burden at the point of entry than other non-traded goods that are sold in the country.

Hence, additional export-oriented activities, even if they do not pay taxes directly, may indirectly be a major supplier of tax revenue to the government.

Tax policies need to be evaluated on an ex-ante basis. A fundamental requirement for the incentive to achieve the desired response is that a significant increase in financial profitability is created to encourage the activity to be undertaken. Often when a micro financial and economic analysis is undertaken at the project level one will find that it is other fundamental issues that are more important than the tax system in determining the overall attractiveness of the investment or expansion in an activity. It is important not to know only how the tax incentive affects the profitability of the activity, but it is important to understand if the activity if incentivized, is worthwhile economically to be undertaken.

From a stakeholder perspective, the government needs to understand the costs and benefits of such an incentive. To enhance the cost-effectiveness of an incentive it should be designed to reward the owners of the project based on their success of implementing the project, rather than a general sector-wide tax expenditure that ends up transferring scarce government revenue to the private sector to increase their rate of return on all new and existing investments.

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Appendix A Summary of The Results of the Sample Studies on the Impact of Fiscal Incentives

Authors	Country	Type of Tax Incentive	Type of Analysis	Models/ Indicators	Effectiveness Results	Efficiency Results
Mogro, (2023)	Ecuador	Temporary exemptions (tax holidays); reductions in the corporate income tax rate	Econometric Analysis	Difference-in-Differences (DiD) Approaches	The two types of tax incentives do not effectively attract new investments or create employment in the prioritized sector.	NA
Córdova, Duque, Aguirre, & Sigüencia (2022)	Ecuador	Income Tax Exemptions	Financial Performance Analysis & Econometric Analysis	Financial indicators & Multiple linear regression model	Positive impact of tax incentives on financial performance across the manufacturing and trade sectors.	NA
Giuliodori, Giuliodori, & Rodriguez (2016)	Argentina	R&D tax credits	Econometric Analysis	Dynamic Panel Data Techniques (GMM)	* Effective in promoting private sector investment in R&D and innovation, especially in capital goods. * Differentiated Impact by Type of Investment: The incentives are more effective in attracting capital goods investment (elasticity greater than 1), while they are less effective for R&D-specific investments (elasticity less than 1), indicating a weaker attraction for R&D spending. *Firm Size Influence: Larger firms benefit more from tax incentives and react more quickly. *Effectiveness Varies by Sector: Firms in low-tech sectors and larger firms tend to gain more from the incentives, which suggests that tax incentives could be more effective if targeted differently across firm sizes and sectors.	NA
Mardones & Becerra (2020)	Chile	R&D Tax Incentive (credit)	Econometric Analysis	Matched Difference-in-Differences (MDID)	lack of effectiveness of the policy (positive but very low effects on some components of innovation expenditure).	NA
Mardones & Sepúlveda (2017)	Chile	tax credit known as 'franquicia SENCE' for labor training	Econometric Analysis	Fixed-effects model	1. Effects of the program on Employees: * statistically significant increase in the hiring of skilled production workers. * Positive impact on productivity (sales per employee) 2. Effects of the program on Companies: Not effective * No statistically significant differences in sales or sales growth for companies that utilized the training program.	NA
Galindo, & Meléndez. (2010)	Colombia	Investment Tax Deduction (Investment allowances)	Econometric Analysis	Fixed-effects panel data model	did not effectively promote investment, as the investment boom is attributed to broader economic factors rather than the tax policy itself.	NA
Blackman (2008)	Colombia	R&D tax deduction	Econometric Analysis	Seemingly Unrelated Regressions method	Although the elasticity of demand for R&D investment is high in Colombia's manufacturing sector (particularly among SMEs), the current tax incentive framework does not effectively stimulate R&D at the desired scale.	NA
García, Sarmiento, Campos, López, & Osma-Pinto (2023).	Colombia	Accelerated Depreciation; Customs Duty Exemption; Income Tax Deduction; Value Added Tax Exclusion	Financial Performance Analysis	Financial indicators such as Return on Assets (ROA), NPV, and IRR	* Tax incentives significantly enhance the financial viability of microgrid (MG) projects * accelerated depreciation and VAT exemption are the most effective incentives.	NA
Amendola, Boccia, Mele & Sensini (2023)	Dominican Republic	corporate income tax exemptions	Econometric Analysis	Propensity Score Matching (PSM)	1. Positive Impact on firm growth and performance 2. Urban vs. Rural Disparities: Urban firms tend to benefit more from these tax incentives compared to their rural counterparts, reflecting varying levels of access to resources and market dynamics	NA

Authors	Country	Type of Tax Incentive	Type of Analysis	Models/ Indicators	Effectiveness Results	Efficiency Results
Jenkins & Kuo (2017)	Dominican Republic	exemption of corporate income from taxation	Economic Simulation Techniques	Economic Simulation Techniques	Removing the CIT exemption in the Dominican Republic's free trade zones (FTZs) could impose a significant burden on low-waged workers, [estimated to be about ten times the additional tax revenue collected].	NA
Feltenstein, A., & Shah, A. (1995)	Mexico	General tax credits; Industry-specific tax credits; Employment tax credits; corporate tax reductions	Structural Model	Dynamic Computable General Equilibrium Model (CGE)	The effectiveness of corporate tax reductions in stimulating investment compared to investment tax credit * corporate tax reduction increases demand for all types of capital, not just new capital, leading to broader economic benefits.	NA
LlambÍ, Carbajal, Carrasco & Cazulo (2018)	Uruguay	Investment tax credits	Econometric Analysis + Efficiency Metrics	Matched Difference-in-Differences (MDID) + Ratio of Tax Expenditure to Additional Investment	1. the investment promotion regime had a statistically significant effect on firms' investment rates. 2. the effects on employment growth are less clear [The manufacturing sector experienced the highest increase in employment growth rate, estimated at around 7.2 percent, while the services sector recorded no significant impact]. 4. The most substantial impacts on both investment and employment occurred in the first year after receiving the tax benefits, with diminishing effects in subsequent years 5. The positive effects on investment are primarily short-term, lasting up to two years, and vary by sector, with the services sector experiencing the highest impact.	1. The ratio of Tax Expenditure to Additional Investment is (33%) [For every dollar spent on tax incentives, about three dollars of additional investment was generated] 2. Efficiency of Credit Against Corporate Income Tax (35%).
Sosa, S. (2006)	Eastern Caribbean	Tax Holidays; Exemptions from Import Duties	Comparative Analysis	Marginal Effective Tax Rate (METR) approach	Tax holidays are highly effective in reducing the tax burden on investment but may also create imbalances, as not all firms benefit equally. [When tax holidays are in effect, the METR drops significantly]	NA
Artana, D. (2015)	Costa Rica El Salvador Dominican Republic	Corporate income tax exemptions(Tax holidays); import duty exemptions	Econometric Analysis	Difference-in-differences (DID; Propensity score matching (PSM) ; Fixed-effects panel regression	1. Costa Rica: Not effective Tax incentives did not lead to increased investment or employment growth] * The econometric analysis did not find significant positive effects of tax exemptions on firm-level investment and employment outcomes in export-free zones. * It suggests that the incentives may have disproportionately benefited high-profit firms that would have invested without them. 2. El Salvador: Not effective * no significant difference in sales growth between firms with and without incentives * firms benefiting from tax exemptions in free zones did not exhibit superior growth in sales relative to non-beneficiary firms. 3. Dominican Republic: Somewhat effective * more effective than in the other two countries, particularly in driving higher firm sales and labor intensity. * The overall effectiveness of fiscal incentives remains questionable, as they may favor projects that would have occurred without such incentives.	NA

Authors	Country	Type of Tax Incentive	Type of Analysis	Models/ Indicators	Effectiveness Results	Efficiency Results
Mele, G. (2017)	Dominican Republic	15-year corporate income-tax holiday for firms established in special economic zones (SEZs)	Cost-Benefit Analysis + Econometric Analysis	Cost-Benefit Analysis + Difference-in-differences	NA	The corporate income-tax holiday tax incentives are not an efficient means of promoting employment growth, especially in free trade zones. The tax incentives, free zone companies create significantly more jobs than companies outside the free zones but at a very high fiscal cost
Chen, D., Harris, P. A., & Zolt, E. M. (2018)	Dominican Republic	TIPT includes a range of tax incentives such as exemptions, Tax holidays, credits, and preferential tax rates, specifically designed to promote investment in the tourism sector.	Cost-Benefit Analysis	Cost-Benefit Analysis	NA	The costs outweigh the benefits and concludes that incentives have not been an efficient tax instrument.
Agostini, C. A., & Jalile, I. R. (2009)	LAC Countries	Change in Income tax rates	Econometric Analysis	Multiple Linear Regression	* Corporate tax rates significantly influence foreign direct investment (FDI) in Latin America. * factors such as market size, infrastructure, investment profile, and rule of law significantly influence FDI, with positive elasticities associated with these variables	NA
Agostini, C. y M. Jorratt (2013)	Chile	Exemption from import tariffs of capital goods; Credit against income tax on purchases of fixed assets o	Cost-Benefit Analysis	Cost-Benefit Analysis	NA	1. Exemption from import tariffs on capital goods: Net Economic Efficiency but the actual economic impact of the imported goods is unclear. * The Benefit (value of the 21% additional capital goods imported) is greater than the Cost (tax loss) by US$184 million. * Although the difference is positive, this does not necessarily imply a positive impact of the law since not all imported capital goods have a positive impact on economic growth and not all potential costs have been estimated. 2. Credit against income tax on purchases of fixed assets: not cost-efficient. *the benefit (additional investment resulting from this incentive) is about four times lower than the estimated cost (loss revenue).
Jorratt de Luis, M. (2010)	Ecuador	Tax Deduction for Net Job Increase; Reduced tax rate for reinvestment of profits; Deferral for Accelerated Depreciation	Cost-benefit analysis	Cost-benefit analysis	1. Deduction for Net Increase in Jobs: * Misaligned National Development Plan (PND) * Modest impact; most job creation would occur without the deduction 2. Reduced tax rate for reinvestment of profits: It is proposed to repeal the reduced rate for reinvestment of profits. * Low uptake; primarily benefits large companies. 3. Accelerated Depreciation: * no clear evidence that accelerated depreciation increased overall investment and that its effectiveness is limited by the treatment of losses from prior periods; * misaligned with PND.	1. Deduction for Net Increase in Jobs: *Low cost-effectiveness [benefit ($31 million) is nearly equal to the fiscal cost]; benefits mainly go to large firms. 2. Reduced tax rate for reinvestment of profits: It is proposed to repeal the reduced rate for reinvestment of profits * Not cost-effective; negative net benefit 3. Accelerated Depreciation: *Not cost-effective

Authors	Country	Type of Tax Incentive	Type of Analysis	Models/ Indicators	Effectiveness Results	Efficiency Results
Moller, L., R. Junquera-Varela and D. Álvarez (2012)	Colombia	VAT exemptions and exclusions; Free Trade Zone Regime; Special Tax Regime for non-profit organizations	Structural Model	Dynamic Computable General Equilibrium Model (CGE)	Moderate effectiveness: The Free Trade Zones regime (RZF) has moderate levels of investment and employment generated, but much of it might occur even without tax incentives.	The fiscal cost is 0.1% of GDP, potentially rising to 0.33% by 2020.
Regazzini, Caetano Bacha & de Souza Ferreira (2021)	Brazil	Lowering rates of taxes	Structural Model	Computable General Equilibrium (CGE) Model	Tax exemptions for agricultural products are more effective than those for vehicles in stimulating Brazil's economy, leading to greater improvements in employment, GDP, and household consumption, particularly in poorer states.	NA
Garsous, Corderi & Velasco (2015)	Brazil	75 percent tax credit	Econometric Analysis	Difference-in-Differences (DiD) Approaches	effective of such policies in job creation: significantly increased tourism employment in less developed regions	The efficiency and cost-effectiveness of the tax incentives remain unestablished,
Klemm, & Van Parys (2012)	40 Latin American, Caribbean, and African countries	Tax Holidays; Reduced Corporate Income Tax Rates; Tax Credits; Investment Allowances	Econometric Analysis	Spatial Econometric Panel Analysis	1. Effectiveness of Tax holidays and lower corporate income tax (CIT) rates in Attracting FDI in LAC but not in Africa. 2. Investment allowances and tax credits show no robust evidence of boosting FDI 3. None of the four types of tax incentives show evidence of an increase in the total private investment.	NA
Van Parys & James (2010)	Eastern Caribbean Currency Union (ECCU).	Income tax exemptions for tourism companies extended from 5 to 25 years.	Econometric Analysis	Difference-in-Differences (DiD) Approaches	Tourism-specific tax incentives (tax holidays) can effectively attract Foreign Direct Investment in developing countries.	Only looks at the benefits of tax incentives and not at the costs.
Abbas, S. A., & Klemm, A. (2013)	50 emerging & developing economies (11 from LAC)	Special regimes, such as tax holidays and reduced rates	Econometric Analysis	Generalized Method of Moments (GMM)	* Effective average tax rates (EATR) have a significant negative correlation with foreign direct investment (FDI) and private fixed investment. *Effective Marginal Tax Rate (EMTR) does not significantly affect overall private investment. * the actual effectiveness of these incentives often depends on the overall investment climate and the specific characteristics of the tax system in each country.	NA
Monge-González & Rivera (2022)	Costa Rica	Free Trade Zone System in Costa Rica	Cost-benefit analysis	Cost-benefit analysis	NA	The aggregate intangible benefits (productivity gains of domestic suppliers that engage with MNCs & higher wage premium received by workers employed by MNCs operating in the FTZ) are 1.5 and 2.3 times greater than the costs associated with tax incentives offered.
Cubeddu, Bauer, Berkmen, Kandil, M., Nassar & Mullins, (2008).	15 Caribbean countries	Change in Corporate Tax Rates	Econometric Analysis	OLS regression/ Statutory Tax Rates & Marginal Effective Tax Rate (METR) approach	* Tax incentives and tax policy have a positive, yet limited, impact on foreign investment flows to the Caribbean. * Other factors such as the quality of institutions and infrastructure have a large positive and very significant effect on FDI.	NA
Chai, Jingqing, & Rishi Goyal. (2008)	Six ECCU member countries	Import-related tax incentives & corporate income tax holidays	Econometric Analysis	Cross-Country Regression Analysis	*Tax incentives have a limited impact on FDI * Tax revenues forgone are large, ranging from 9.5 to 16 percent of GDP annually.	NA

Authors	Country	Type of Tax Incentive	Type of Analysis	Models/ Indicators	Effectiveness Results	Efficiency Results
Porsse, A., Haddad, E., & Ribeiro, E (2007).	Brazil	Several tax incentive packages/automobile sector	Structural Model	Interregional computable general Equilibrium model- B-MARIA-RS (Brazilian Multisectoral &Regional/Interregional Analysis–Rio Grande do Sul)/	* The effects on employment and the household welfare of consumers are positive for the region implementing incentive policy. * The effects on real GDP is negative and relatively small	NA
Porsse, A., & Carvalho, S. (2019)	Brazil	Payroll tax exemption	Structural Model	ORANIGBR Model – based on the Australian ORANI-G framework	The payroll tax exemption policy would imply a cumulative growth impact of 0,34% in GDP, while the new policy of removing part of the payroll exemption leads to a cumulative negative growth impact of 0,37%.	NA
Stausholm, S. N. (2017)	51 developing countries (18 LAC countries & 11 Caribbean countries)	Tax holidays	Econometric Analysis	Dynamic panel model with fixed effects	* The use of tax holidays or changing the tax rates does not translate into either real capital accumulation or economic growth. * Tax holidays have a negative correlation with tax revenues	NA

Appendix B Main Corporate Tax Incentives for Investment by Country, 2024

	Corporate Income Tax Incentives									
Country	**Tax holidays (Years)**	**Reduced Rates or Income Tax Reduction**	**Deductions or Credits for Investment**	**Accelerated Depreciation**	**Tax Stability Contracts**	**Sectoral Incentives**	**Localization incentives**	**Other exemptions**	**Free / Special Zones**	**Exemption from Indirect taxes/Tariffs**
Argentina 2024	-	Income tax reduction that corresponds to knowledge-related" economic areas/ 50% reduction of income tax liability for activities in organic sustainable production	10% credit for productive investments by MSMEs/ R&D credit, venture capital investors can deduct up to 75% of investment contributions from their income tax taxable base, or 85% in less developed areas /tax credit bond for generation of distributive renewable energy/	Yes (mining, renewable energy, forestry, biotechnology, nanotechnology exploration, and exploitation of hydrocarbons, automobiles, and auto-parts manufacturing)	Yes (mining, forestry, large investment, Knowledge -Economy	Mining, Forestry, Capital goods production, R&D, Biotechnology, Knowledge-related" economic activities, Biofuels, Renewable energy, Auto parts, SMEs.	Tierra del Fuego, Antarctica, and South Atlantic Islands	Fideicomisos and mutual funds developing/investing in real estate, farming, forestry, and infrastructure projects / Software (60%)/ Tierra del Fuego/ Income derived from the management of commercial woodlands	Yes	Free Trade Zones, Tierra del Fuego and certain sectors (Renewable energy, mining, forestry, exploration and exploitation of hydrocarbons, free trade zones)/ Importation of parts for ships, auto parts/ Exemption from VAT on interest on home loans
Bolivia 2024	10 years (Oruro, Potosí and cities of El Alto and Yacuiba)	No	No	Manufacturing firms can opt for accelerated depreciation on fixed assets acquired during designated periods	No	Mining, Hydrocarbons, Generation of energy alternatives to diesel (Beni and Pando)/ Urban settlement projects/ Certain cultural activities	Manufacturing industries established in the cities of Oruro and Potosi, under certain conditions/ ZOFRA Cobija	Capital gains and investment returns on securities issued by NAFIBO SAM/ Interest on public debt issued abroad	Yes, ZOFRA Cobija	free zone is exempt from VAT, excise duties, the tax on hydrocarbons and derivatives, and customs duties/ sales of tourism packages by Bolivian travel agencies as well as hotel and food services provided to foreign tourists, are considered as exportations of services, and hence VAT is levied at a 0% rate
Brazil 2024	10 (north and northeast)	(Debentures infrastructure, Semiconductors/ north-east and Amazon regions (SUDENE and SUDAM, respectively)	north-east and Amazon regions/ R&D Incentive/ free zones and bonded warehouses,	Yes, north-east and Amazon regions/ R&D Incentive/ free zones and bonded warehouses,	No	Infrastructure projects, digital TV and semiconductors (PADIS)/ infrastructure projects in transport, port, energy, basic sanitation and irrigation (REIDI)	Development of infrastructure related to the oil business in the north, northeast, and central regions of Brazil (REPENEC) / SUDENE & SUDAM (North-East & Amazon)	Priority Projects in SUDAM and SUDENE (75% reduction of IRPJ for 10 years)	Yes	Exporters of manufactured products/Free trade zones, IT sector, automotive and aerospace industry, Biodiesel, Thermoelectricity, Petroleum, Natural Gas, Ships and Aircraft/Import of Machines and Equipment for R&D, semiconductors, nuclear plants, port structure, infrastructure

	Corporate Income Tax Incentives									
Country	**Tax holidays (Years)**	**Reduced Rates or Income Tax Reduction**	**Deductions or Credits for Investment**	**Accelerated Depreciation**	**Tax Stability Contracts**	**Sectoral Incentives**	**Localization incentives**	**Other exemptions**	**Free / Special Zones**	**Exemption from Indirect taxes/Tariffs**
Chile 2024	Quique and Punta Arenas free zones/ 44 years in Tierra del Fuego (Porvenir and Primavera/ 50 years in part of Region XII (until 2035)	Yes (10% of income from Foreign Investment Funds)	4% credit for fixed asset purchases/ Credit for investments in the far north (30%) and south (32%)/ Credit for Solar Thermal Systems (100%)/ R&D Credit (35%	Standard accelerated depreciation (only one-third of the normal useful life of the asset)/ Special Transitory Depreciation (50% Immediate Depreciation for new investment projects)	Tax Invariability Contracts for foreign investors	Industrial, mining, deep sea mining, transportation, and tourism activities in the territory of the XII region and communes of Provenir and Primavera	Northern and Southern Regions Incentives: Tax benefits for companies operating in the northernmost (Arica–Parinacota, Tarapacá) and southernmost regions (Palena Province, Aysén, Magallanes)	Income from companies in free trade zones, Region XII, Tierra del Fuego and Easter Island	Yes	foreign investors exemption from VAT on imported capital assets / Imports in free trade zones/XII Region/
Colombia 2024	Clean Electric Power:15-year for wind, biomass, or agricultural energy (since 2017)/ Ecotourism & new hotels:20-year for those qualified before 2018/ ZESE: 5-year La Guajira, Norte de Santander, and Arauca (until 2024), then 50% for 5 more years.	20% for FTZs, / 15% for hotel services and services provided by ecotourism and agritourism parks/ 3%-10% for foreign companies that sell digital goods or services to customers in Colombia. / 0% Income Tax Rate: For the first 5 years for companies that demonstrate a 15% increase in new direct jobs in the Special Economic and Social Zones (ZESE)	R&D Companies (100% deduction on R&D investments and a 25% tax credit)./ environmentally friendly projects (25% tax credit)	clean energy can benefit from accelerated depreciation rates of up to 33.33% annually.	Yes	Renewable energy/ R&D/ New Forest plantations/ River transport/ Hotels/ SMEs/ Film projects	Investments in regions affected by the armed conflict – ZOMAC/	Capital and interest on public external debt operations/Sale of shares and securities (under certain conditions)	Yes	Temporary importation of raw materials, inputs, intermediate or capital goods for the production of export goods (Vallejo Plan) / Machinery, equipment, materials and inputs for investment in renewable energy / Discount or refund of VAT paid on the acquisition and importation of goods and services in hydrocarbon exploration activities in offshore projects / Border areas and the Archipelago of San Andrés, Providencia and Santa Catalina (exemption from sales tax on fuels)

	Corporate Income Tax Incentives									
Country	**Tax holidays (Years)**	**Reduced Rates or Income Tax Reduction**	**Deductions or Credits for Investment**	**Accelerated Depreciation**	**Tax Stability Contracts**	**Sectoral Incentives**	**Localization incentives**	**Other exemptions**	**Free / Special Zones**	**Exemption from Indirect taxes/Tariffs**
Costa-Rica 2024	6, 8, 12 (FTZ depending on location)	Reduced rates up to 20% for small enterprises/ Industries in FTZs, whether they export or not: 0%, 5%, 6%, or 15% for a given period (depending on location and investment)	income tax exemption for companies reinvesting in Costa Rica after 4 years from the start of operations.	-	-	Tourism development, forestry, Organic agricultural activities	designated Free Trade Zones	Tax exemptions are granted to persons who are involved in organic agricultural activities/ FTZs Exemption from taxes on immovable property.	Yes	FTZs (sales and consumption taxes levied on the purchase of goods, taxes on the importation of raw materials, products, parts, packing material, containers, machinery, equipment, spare parts, vehicle lubricants, and other necessary goods for their operation, axes on the exportation or re-exportation of products, machinery, and equipment) / Tourist Promotion (taxes and surcharges on imports or local purchases necessary for the functioning or installation of enterprises)/ Organic Agriculture (custom duties on equipment for organic agricultural product).
Ecuador 2024	8, 12-, or 15-years priority sectors and 15- or 20-years basic industries (depending on the area) / 20 years tourism SMEs / 3 years new microenterprises / 5 years merged entities popular and solidarity financial sector / FZs or operators for the first 5 years (since 2024)/ 10-year income tax exemption on dividends or profits derived from public-private partnerships (PPP)/ 10 years for SEZs.	15% CIT if profits are reinvested under certain conditions (Companies engaged in knowledge creation activities)/ 2% CIT (applicable to micro enterprises on gross annual turnover)/ 3% Income Tax Reduction for New Investments (as of 2024)/ 5% Reduction for Investment Contracts/ A reduction of 10%, 8%, or 6% on reinvested profits is available for companies engaged in responsible scientific investigation or technological development projects.	Double deduction for depreciation of fixed assets for clean production / Double deduction (for medium-sized companies for 5 years) for expenses on training, R&D, and travel expenses for market access / Additional 10% deduction for purchases from microenterprises in the popular and solidarity economy / Credit for the Foreign Exchange Tax (5%) for the importation of raw materials, capital goods, and inputs.	Yes (with prior authorization from the Regional Director of the SII for new fixed assets with a useful life of more than 5 years).	Tax stability is granted to FZ´s investors during the covered period.	Agriculture, Agroforestry chain, Metalworking, Petrochemicals and Oleochemicals, Pharmaceuticals, Tourism, Film, Renewable energies, foreign trade logistics, Biotechnology, Software and hardware, Export of services, Energy efficiency, Sustainable construction, Industrial and agro-industrial sector, Exportation, Hydrocarbons, Basic industries, Microenterprises, Popular and solidarity financial sector.	Economically depressed and border zones: Double deduction of salaries and social benefits for 5 years.	Companies and investment funds/ Investment in real estate (under certain requirements)/ Income from Ecuadorian public debt.	Yes	Machinery, raw materials, and supplies for agricultural sector aquaculture sector, and fishing sector. / Fishing boats/ Solar panels and wastewater treatment plants/ Imported raw materials, capital goods, and inputs for production. / Scientific research and technical support/ Tourism services. / Activities in FZs. / Exports of Ecuadorian goods to (FZs) that are destined for production within those zones.

	Corporate Income Tax Incentives									
Country	**Tax holidays (Years)**	**Reduced Rates or Income Tax Reduction**	**Deductions or Credits for Investment**	**Accelerated Depreciation**	**Tax Stability Contracts**	**Sectoral Incentives**	**Localization incentives**	**Other exemptions**	**Free / Special Zones**	**Exemption from Indirect taxes/Tariffs**
El Salvador 2024	FZs, International Service Parks, Technology, Manufacture, and Innovation (income tax exemption for 15 years; municipal tax exemption for 10 – 15 years). / New tourism projects (10 years)/ renewable energy generation (5, 10 years).	25% for companies whose taxable income does not exceed USD 150,000	tax deduction for geothermal resource recycling expenses. (20% to 25% of the taxable income)	No	No	International Service, electric energy generation, technology and innovation activities, tourism, renewable energy, printing	Free zones	Exemption from municipal taxes for service providers/ transfer of real estate for developers of International Service Parks/ Technology, Manufacture, and Innovation (15-year Exemption from Capital Gains Tax)	Yes	FZs, International Service Parks and electric energy generation, technology, and innovation activities (machinery, equipment, tools, spare parts, and other necessary assets), FZs (raw materials, components, semi-finished products, and packaging, lubricants, catalysts, reagents, fuels, merchandise for users engaged in international trading activities)./ new tourism projects(goods, equipment, accessories, machinery, vehicles, airships, boats, and construction equipment)
Guatemala 2024	10 years (FZs, & Export manufacturing activities on income generated from export-oriented activities)/ Special Public Economic Development Zones (ZDEEP) / renewable energy (10 years)	No	No	No	No	Renewable energy, textile industry, and international ICT services (maquila)	Free zones/ Special Public Economic Development Zones (ZDEEP)	-	Yes	importing goods or machinery necessary for the economic activities undertaken within FZs/ Export manufacturing activities/ ZDEEP (machinery, equipment, components, and accessories necessary for production).
Honduras 2024	Industries exporting non-traditional goods (10 years) EPZs (income tax for 20 years and municipal taxes for 10 years) / Renewable energy (10 years for projects with a capacity exceeding 50 MW/ SMEs (income tax 5 years, net asset tax for 5 years, wealth tax for 5 years)	reduction of income tax for the first 5 years after the incorporation of the SME.	Employment Tax Credit (10% of the annual minimum salary for each new employment position created)/	SMEs: Special Depreciation Rules: The reactivation program for SMEs under Decree 48 of 2022 includes special depreciation rules, which could provide further tax relief for assets.	-	Tourism, Renewable energy, Biofuels, business services, Non-traditional agricultural production for export, Cañaveral Energy Project	Free Zones/ Export Processing Zones (EPZs)/ Industrial Parks/ Tourism Free Zones/	Exemption from withholding tax for foreign persons or companies providing services related to renewable energy projects/ Amortization of pre-operative expenses	Yes	Export Promotion (Duty-free treatment for imported raw materials and components necessary for the production of goods or services for export)/ FZs & EPZs and Tourism Free Zones (importation of production machinery, raw materials, and supplies / renewable electricity generation (Exemption on equipment, materials, and spare parts)

	Corporate Income Tax Incentives									
Country	**Tax holidays (Years)**	**Reduced Rates or Income Tax Reduction**	**Deductions or Credits for Investment**	**Accelerated Depreciation**	**Tax Stability Contracts**	**Sectoral Incentives**	**Localization incentives**	**Other exemptions**	**Free / Special Zones**	**Exemption from Indirect taxes/Tariffs**
México 2024	-	No	R&D tax credits (30% of their incremental R&D expenses and investments)/ For investments Film industry (10%)/ Investments made in high-performance sports/ 30% Tax Credit (with carrying forward Option) on Electric Vehicle Power Feeders/ Northern and Southern Borderline Regions (one-third of the income tax accrued)/ 100% tax credit & Immediate deductions of the original investment in new fixed assets in the Isthmus of Tehuantepec/ Immediate Deductions to promote nearshoring (for the production and export of specific goods; Maximum Deduction Percentages 56% - 88%)	Accelerated depreciation of 100% of the investments Isthmus of Tehuantepec	-	Film industry, sports infrastructure, Agro-Industry, Renewable Energy, Industry (Electrical and Electronics; Semiconductors; Automotive and Auto Parts; Medical Devices and Pharmaceuticals; Machinery and Equipment; Metals and Petrochemicals), International Services (ICT)	Northern & Southern Borderline Regions/ Isthmus of Tehuantepec (Oaxaca and Veracruz)/ Special Economic Zones (SEZs) including Yucatán Special Economic Zone Tijuana Industrial Park Guadalajara Industrial Park Monterrey Industrial Park	Additional deduction of 25% on the increase in expenses incurred for employee training	Yes	Sector exportador: Processing export companies (maquiladoras, IMMEX companies)/ Isthmus of Tehuantepec
Nicaragua 2024	FTZ Operators (15 years)/ enterprises within FTZs (Usuarias) (10 -20 years)/ Tourism investment (80% to 100% for 10 years)/ renewable energy (7 years)	fishing activities along the Caribbean coastline (CIT rate is 2 -3%)/ companies with lower income (CIT rate is 1 - 2%)	-	Exporters	-	Agriculture, Fishing, and Industry/ Tourism/ Health/	FTZs/ Caribbean coastline	Exporters are entitled to a credit of 25% of the specific oil tax (IECC) paid/ FTZ Operators (Full exemption from municipal taxes)	Yes	Raw Materials and Semi-Processed Goods, Capital Assets and Related Items, Equipment for Production Facilities/ specific goods and assets used in agricultural activities and by fishing and industrial enterprises/ goods imported to enable the operation of the enterprise in the FTZ/ Hospital Investments / 10-year exemption for the acquisition of goods needed for construction, equipment, and activities related to the hotel industry/goods required for the construction of renewable energy plants

	Corporate Income Tax Incentives									
Country	**Tax holidays (Years)**	**Reduced Rates or Income Tax Reduction**	**Deductions or Credits for Investment**	**Accelerated Depreciation**	**Tax Stability Contracts**	**Sectoral Incentives**	**Localization incentives**	**Other exemptions**	**Free / Special Zones**	**Exemption from Indirect taxes/Tariffs**
Panama 2024	13 years (Reforestation regime) / Colon Free Zone (CFZ) exports / 10 years (Biogasoline, biomass electricity) / 15 years (Wind power plants) / 25 years (City of Knowledge) / 15 years (Tourist activity, new lodgings) / 5 years (Income tax exemption for existing tourist accommodations).	5% multinational enterprises providing manufacturing services (EMMA) & Headquarters of multinational companies (SEM)/	EMMA & SEM Foreign tax credit / 100% income tax credit for tourism companies / Tax deduction for travel agencies and operators / Deductions for restoring and maintaining historical monuments.	wind power generation	Yes	Forestry, Trade and Exports, Renewable Energy, Technology, Tourism, Manufacturing, Infrastructure	FZs	Tax on dividends with SEM or EMMA license / Income tax exemption for certain activities in PPSEA / 5-year capital tax exemption for new tourist lodgings.	Yes	Equipment, supplies, raw materials, machinery, tools for FZ companies / 10 years for energy, biogasoline, biomass equipment/wind power plant equipment/customs duties exemption for City of Knowledge & PPSEA / construction materials, equipment, furniture for tourist lodgings, cruise ship ports/goods entering Colon Free Port (FPC).
Paraguay 2024	Up to 10 years for approved investment projects of at least USD 13 million	0.5% on total export turnover in or sales of finished products and services within the FZs/	No	No	Yes	Processing export companies Manufacturing, Agricultural, Automobile Industry, Trade and Commerce, service	FZs	Exemption from Fiscal and Municipal Duties for the automobile industry	Yes	Processing export companies (maquiladoras), free zones (FZs), and small agricultural and industrial companies benefit from incentives, including goods used in the automobile production process, a reduced VAT of 10% on 20% of the sale price of new vehicles, and the import of capital goods, raw materials, and supplies destined for the domestic industry.
Peru 2024	Until 31 December 2042 (Special Development Zones (SDZs))/ ZOFRATACNA free zone	farming companies (15% to 25%) / Jungle Region (reduced corporate income tax rate of either 10% or 5%)	Farming sector (10%)/ Deduction for Infrastructure Investments in the Mining sector/ Textile and Clothing Industry (a tax credit of 20% of the reinvested amount of annual profits)	Construction sector/ Farming sector (hydraulic infrastructure works and irrigation works)/ Textile and Clothing Industry (Machinery and Equipment)	(10-Year Stabilizatio n Regime: investing at least USD 10 million in the mining or oil sectors)/ Agreements for other sectors: investments of at least USD 5 mill	Film /Farming/Mining/Textile and Clothing Industry/Construction/Oil	Special Development Zones (ZEDs))/ ZOFRATACNA free zone/ Jungle Region/	Deduction of Pre-Operative Expenses for mining projects/ Companies may deduct up to 10% of the amount of donations made to film projects from the company's taxable income	Yes	ZOFRATACNA free zone/ Jungle Region/ mining or hydrocarbon exploration/ Agricultural inputs/

	Corporate Income Tax Incentives									
Country	**Tax holidays (Years)**	**Reduced Rates or Income Tax Reduction**	**Deductions or Credits for Investment**	**Accelerated Depreciation**	**Tax Stability Contracts**	**Sectoral Incentives**	**Localization incentives**	**Other exemptions**	**Free / Special Zones**	**Exemption from Indirect taxes/Tariffs**
Dominican Republic 2024	25 Year: FTZs near the Dominican-Haitian border/ 15 years FTZs in other parts of the country/ 15 years: tourism/ 10 years: renewable energy/ 10 years: film industry/ 15 years: Movie Theatre Construction & Film Production Studios/ 5 years: Solid waste management	-	20% of the investments made in a CONFOTUR-approved project/ 40% of the investment costs in equipment Companies transitioning from traditional energy supply methods to alternative energy generation/ 100% deduction for cash investments in the copyright protection	Double Depreciation Allowance for companies to develop, modernize, and innovate within their industries.	Yes (During the tax exemption period, no new taxes, tariffs, or fees can be imposed on tourism companies).	Tourism/ renewable energy / Film industry/ manufacturing/ Cultural projects	Special Border Development Zones (provinces of Pedernales, Independence, Elias Piña, Dajabon, Monte Cristo, Santiago Rodriguez, and Bahoruco)	A 100% refund is available for specific taxes incurred on the consumption of fossil fuels and petroleum derivatives for renewable energy projects.	Yes	FTZs/ tourism activities/ Innovation incentives and manufacturing value chain/ reimbursement of ITBIS, selective telecommunication tax, and insurance, fuel, and check tax/ exemption from 18% ITBIS (Value Added Tax) on machinery and equipment required for waste management activities/ Publishing industry/ Film production/ movie theaters
Uruguay 2024	Shared Services Centres (70-90% exemption 5 years extendable to 10 depending on the qualified jobs created)/ planting and commercial exploitation of forests (since 2007)/ FZs (5, 10, or 15 years (depending on the activity and type)/ construction activities (Up to 90% of CIT can be exempt for 10 years based on the amount of the investment)	No	Deduction of up to 100% of investments in machinery and fixed assets/ Export-oriented businesses (Deduction of IRAE for 20% to 100% of the investment)	Tourism industry: special depreciation treatment for IRAE (15 years for real estate and 5 years for equipment)	-	manufacturing, extractive, or farming ranching activities/ tourism/forestry/Industrial promotion fishing, agricultural companies, dairy producers and mining companies/ R&D in biotechnology and bio-information fields/ software-related R&D activities	FZs in various areas.	For promoted investment, Export-oriented businesses, Shared Services Centres, construction activities & tourism industry: wealth tax exemption on movable assets and real estate (8 to 10 years)/	Yes	VAT, customs duties exemptions for promoted investment/ tourism industry/Export-oriented businesses/ FZs/ construction activities

Appendix C: Application of Cost-Benefit Analysis of Tax Incentives to Specific Sectors

In this analysis, two different situations are considered.[12]

The first is an export-oriented firm where the tax incentives are being applied to a situation where no specific international trade incentives are present to promote this exporting firm. The cotton yarn firm producing for export is typical of such an enterprise.

The second situation is an import substitution situation where the firm is already eligible for substantial incentives provided by the import tariff system. The additional income tax incentives are then applied to this investment to encourage it to be set up to produce an import substitution good. The PVC pipe firm that would be set up to provide import substitute goods is typical of such an enterprise.

Appendix C.1: Application of Cost Benefit Analysis of Tax Incentives in the Textile Sector: Case of Study of a Representative Firm Exporting Cotton Yarn

This analysis focuses on the impact of the corporate income tax holiday on the return on investment by the export-oriented firm in Colombia.

I. Overview of Tax Incentive for Textile and Textile Products

The tax incentives for firms that are in the textile and textile products sector are as follows :

a) 100% Custom duties exemption for importing capital goods, such as plant, machinery, and construction materials.
b) Exemption of customs duties on imported material inputs and components required to produce goods in case of exports.
c) Corporate income tax holiday for 2-6 years, depending on the location.

II. Project Description

The total investment cost for the cotton yarn project is estimated to be 1,397.4 million Colombian pesos (COP). The project is assumed to have an operating life span of 10 Years. The project financing debt-equity ratio is 50-50. The real interest rate charged on the loan is 4%. The

[12] It should be noted that these case studies are hypothetical examples of applying the CBA to two different sectors, intended for illustrative purposes only, and have not been used in actual decision-making related to the provision of tax incentives.

investment will create employment of 40 workers. The proportion of the type of workers to the total labor employed for skilled, semi-skilled, and unskilled are 27%, 50%, and 23%, respectively. The project is assumed to pay the average market wage for its labor.

The capital costs indicate the uses of the funds including land lease, building & civil works machinery & equipment, and office furniture. In terms of investment financing, the loan equals 50% of the capital cost, which amounts to 698.7 million COP. The remaining 50% is financed by equity.

III. Financial Analysis of the Impact of the Income Tax Holiday on a Firm Exporting Cotton Yarn

The analysis begins by constructing a cash-based financial model for a firm exporting cotton yarn from Colombia. The project output is cotton yarn (exportable good). The major input used by the project is raw cotton (an exportable input, given that Colombia exports raw cotton). The other inputs in producing cotton yarn are chemicals, water, electricity, packaging materials, and labor. In addition, the project also incurs annual maintenance and repair costs during the project's operating period.

The list of variables, technical coefficients, and assumptions used in the financial and economic models are presented in Table C.1.1.

Table C.1.1 Cotton Yarn Exports Case Study: Model variables, technical coefficients, and assumptions

Timing Assumptions	
Investment Year	Year 1
Operating Period	Year 2 – Year 11
Liquidation Period	Year 12
Capital Expenditures	
Machinery & Equipment	137,057 USD
Land Lease, Building & Civil Works	782 million COP
Office Furniture	20.4 million COP
Financing	
Debt/Equity (ratio)	50-50
Supplier's credit	-
Real Interest rate	4%
No of Installments	5 Years
Economic Depreciation	
Machinery & Equipment	5 Years
Building	25 Years
Tax Depreciation	
Machinery & Equipment	5 Years
Building	20 Years
Office Furniture	5 Years
Production Capacity & Actualization	
Annual Production Capacity	440 Ton
Waste Material (% of Production Capacity)	20%
Annual Cotton Yarn Actualization	352 Ton

Major Direct Inputs	
Annual Quantity of Raw Cotton	440 Ton
Annual Quantity of Chemical	33 Ton
Packaging Material (Annual Cost)	10,200,000 COP
Labor	
No. of Skilled	11
No. of Semi-Skilled	20
No. of Unskilled	9
Utility	
Electricity	816.8 MWH
Water	4125 m^3
Maintenance & Repair (M&R) Cost	
Annual M&R cost (% of Capital Cost)	5%
Working Capital	
Accounts Receivable [as % of Gross Sales]	8%
Accounts Payable [as % of Total Input Cost excl. Labor]	8%
Cash Balance [as % of Total Operating Cost Incl. Labor]	8%
Tax	
VAT	15%
Corporate Income Tax	30%
Discount Rate	
Financial (Equity)	12%
Economic (EOCK)	12%
Macroeconomic Parameter	
US Inflation rate (20 years average)	2.2%
Inflation rate (20 years average)	15%
FEP	6.5%

Source: Hypothetical analysis for illustrative purposes.

- **Base Case Model Analysis**

In the base case of the analysis, it is assumed that there is already a 100% Customs duties exemption for importing capital goods, such as plant, machinery, and construction materials. In addition, there is an exemption of customs duties on imported material inputs and components required to produce goods in case of exports. These provisions are part of the normal trade policies in Colombia and are not considered a special export tax incentive. It is also assumed that there exists an effective and timely VAT input tax refund system for exporters. [13]

- **Model Result *"Without Income Tax Holiday"***

The following assumptions are established in this scenario:

a) No delay in the refunds of the VAT paid on inputs (immediate refunds).
b) Profits of the export sales are subject to a corporate income tax of 30%.

[13] While this exists in the VAT legislation, the administrative practice of refunding VAT tax credits may not exist in practice.

c) The investment is all completed in the first year. The operating life of the project is 10 years, with residual values reported in year 12.

Table C.1.2 reports the base case summary financial results without an income tax holiday. The net present value (NPV) after tax is estimated to be 20.4 million COP. The investment's internal rate of return (IRR) equals 12%. This rate of return is also equal to the firm's minimum required rate of return (financial discount rate). In other words, this is a profitable firm that pays income taxes, and its net tax return and inflation are approximately 12%. In this situation, the present value of the total corporate income taxes paid during the operating period of cotton yarn exports is estimated to be 346.8 million COP. Given that there is an immediate refund within each tax period of the VAT paid on inputs by the firm, the present value of the total VAT paid on inputs is equal to 0 million COP.

Table C.1.2 Model Result "Without Income Tax Holiday"

	A. Private Investor's Perspective	
1	Financial NPV@12% (After Tax)	*20.4 M'COP*
2	Financial IRR	12%
	B. Government's Perspective	
3	PV Corporate Income Tax	346.8 *M'COP*
4	PV VAT Paid	0 *M'COP*

- **Model Result *"With Corporate Income Tax Holiday"***

In this analysis, the incentive impact is quantified for the income tax holiday on the return to investment by the representative firm exporting cotton yarn. The value of the tax savings to the firm is quantified as the fiscal costs to the government.

Table C.1.3 presents the summary results of the representative firm exporting cotton yarn with a 6-year income tax holiday[14]. With a 6-year income tax holiday incentive, the financial IRR increases by three percentage points from 12% to 15%. The present value of tax benefits of 207.4 million COP to the firm, [15] increases the financial NPV from 20.4 million COP to 227.8 million COP. In addition, the tax benefit to the firm equals the tax revenue loss of 207.4 million COP to the Government.

[14] The maximum years of income tax holiday in the textile sector

[15] Income tax paid = 346.8 million (without the income tax holiday) – 139.4 million (with the income tax holiday)

Table C.1.3 Model Results "With Income Tax Holiday"

		Without Income Tax Holiday	With Income Tax Holiday
	A. Private Investor's Perspective		
1	Financial NPV@12% (After Tax)	20.4 *M'COP*	227.8 *M'COP*
2	Financial IRR	12%	15%
	B. Government's Perspective		
3	PV Corporate Income Tax	346.8 *M'COP*	139.4 *M'COP*
4	PV VAT Paid	0 *M'COP*	*0 M'COP*
5	PV Tax Benefit to Firm		207.4 *M'COP*
6	PV Tax Revenue Impact on Gov't		-207.4 *M'COP*

In an effective VAT refund system, the income tax holiday impacts the financial return on the investment to the representative firm exporting cotton yarn. It raises the financial IRR from 12% to 15% of the project.

The present value of the total labor cost is estimated to be 231.2 million COP; the total tax revenue loss equals 207.4 million COP. Hence, the ratio of loss in tax revenue to wage bills is approximately 90%. Alternatively, suppose a comparison is made between the value of the tax benefit and the firm's investment. In that case, it equals 14.8% of the initial investment of 1397.4 million COP required to set up this firm.

In this case, the tax holiday is expected to provide a positive incentive for firms to enter into such an export-oriented business.

IV. Economic Analysis of the Impact of the Tax Incentive on a Firm Exporting Cotton Yarn

This analysis evaluates the economic value of the output it creates and the economic resource cost of its inputs according to the incentivized investment.

No import duties are levied on the imported inputs, nor is there an export tax on the exported yarn. The principal distortion in the system is the foreign exchange premium that will increase the economic cost of tradable inputs to be greater than their financial costs. At the same time, the foreign exchange premium will be an additional benefit from the foreign exchange receipts obtained from the sales of the yarn exports. This premium reflects the indirect taxes lost in the economy when foreign exchange is used to purchase inputs for the project or the indirect taxes

gained when the project's output is exported and foreign exchange is earned for others in the economy to buy in order to purchase imports from abroad.

- **Economic Valuation and Conversion Factors**

The project produces exportable goods (cotton yarn), which will positively increase the supply of exports hence foreign exchange to the country. However, the significant input of the project is raw cotton, which is also an exportable input. If the raw cotton were not used for this project, it would have been exported, thus, resulting in an opportunity cost of purchases of raw cotton having an economic value greater than its financial value by the rate of the foreign exchange premium.

The methodology for calculating the economic conversion factors for the major input and output is presented in the following illustrative examples:

1. *Cotton Yarn (Exportable Output):* The project produces an exportable good, which will positively increase the supply of exports hence foreign exchange to the country. The economic price of the export is determined by the FOB price and augmented by the foreign exchange premium (*FEP*) to reflect the true value of this output. The financial price will be adjusted for any export tax (T_x). There is no export tax levied on raw cotton. The conversion factor for cotton yarn (exportable output) is estimated to be equal to 1.065, as expressed below;

$$\boldsymbol{CSCF_{Cotton\ Yarn}} = \frac{Economic\ Value}{Financial\ Value} = \frac{1 + FEP}{(1 - T_x)} = \frac{1 + 6.5\%}{(1 - 0\%)} = \mathbf{1.065}$$

The conversion factor for cotton yarn is 1.065. The economic value of the earnings from the export of cotton yarn is greater than the financial receipts received by the firm.

2. *Raw Cotton (Exportable Input):* The project's major input is raw cotton. However, the significant input of the project is an exportable good in Colombia. If the raw cotton were not used for this project, it would have been exported, thus, resulting in an opportunity cost of purchases of raw cotton having an economic value greater than its financial value by the rate of the foreign exchange premium. The economic cost will be adjusted for this premium (1 + FEP). Furthermore, the domestic sales of raw cotton are subject to VAT; thus, the financial value must be adjusted for this distortion. There is no export tax levied on raw cotton. The conversion factor for raw cotton is estimated to be equal to 0.93, as expressed below:

$$\boldsymbol{CSCF_{Raw\ Cotton}} = \frac{Economic\ Cost}{Financial\ Cost} = \frac{1 + FEP}{(1 - T_x + VAT\ (1 - T_x)} = \frac{1 + 6.5\%}{(1 - 0\% + 15\%(1 - 0\%)} = \mathbf{0.93}$$

- **Economic Analysis Model Result**

The economic opportunity cost of capital (EOCK) is used as the economic discount rate to evaluate the project's net economic benefits over time. The EOCK measures the real opportunity cost of the funds drawn out of the pool of capital available to the country to finance investments.[16] The EOCK for Colombia used in this analysis is also assumed to be a real rate net of inflation of 12%.

The cotton yarn exports generate significant economic benefits higher than their economic costs, resulting in a net present value of 615.4 million COP with an economic rate of return of 21%. The positive economic NPV indicates that the economic value of the output of yarn sold abroad is higher than the economic costs of the inputs, both investment costs and operating costs.

Table C.1.4 Economic Analysis Model Result

	Economic Perspective	
1	Economic NPV(@ EOCK12%)	615.4 *M'COP*
2	Economic IRR	21%

This is an activity that is clearly economically very worthwhile. If the income tax holiday is needed to provide enough initial incentive for investors to enter into this business, then it is amply justified by the expected economic net benefits it would generate.

V. Stakeholder Analysis of the Impact of the Tax Incentive on a Firm Exporting Cotton Yarn

This analysis demonstrates the movement of tax revenue from the government to the targeted enterprises and vice versa as a result of the income tax holiday that causes investment to be made in the cotton yarn sector. Table C.1.5 presents the stakeholder analysis summary model results in an effective VAT refund system.

Without the tax incentive, in an efficient VAT refund system,[17] the difference between the economic net present value of 615.4 million COP and the financial net present value real of 20.4 million COP indicates the stakeholder impacts other than the impact on the private owners of the

[16] Jenkins, Kuo, and Harberger, *"Chapter 8: Economic Opportunity Cost of Capital " Cost-Benefit Analysis for Investment Decisions,* (2019)
[17] Whereby there are immediate refunds of the VAT paid on inputs by the firm exporting cotton yarn.

project. In this case, other stakeholder impacts are net tax revenues that accrue to the government, which amounts to 595 million COP.

The total tax revenues accruing to the government of 595 million COP are further distributed to show how these tax revenues are generated. Corporate income tax revenues collected by the government amount to 346.8 million COP. Personal income tax revenues amount to 108.8 million COP. The indirect tax revenues from this project (without tax incentives) generate more foreign exchange from its export sales than it uses to purchase inputs. The net effect on indirect tax revenues amounts to 139.4 million COP.

If the project is not implemented without the income tax holiday, the economy loses potentially 615.4 million COP, and the government earns zero taxes.

Table C.1.5 Stakeholder Analysis Summary Model Results – Effective VAT Refund System (PV.EOCK@12%)

		Economic (1)	**Financial** (2)	**Stakeholder Impact** (3)[18]	**Corporate Income Taxes** (3A)	**Personal Taxes** (3B)	**Indirect Taxes** (3C)
1	Without Income Tax Holiday	615.4 *M'COP*	20.4 *M'COP*	595 *M'COP*	346.8 *M'COP*	108.8 *M'COP*	139.4 *M'COP*
2	With Income Tax Holiday	615.4 *M'COP*	227.8 *M'COP*	387.6 *M'COP*	139.4 *M'COP*	108.8 *M'COP*	139.4 *M'COP*

If the income tax holiday (i.e., 207.4 million COP tax expenditure[19]) is required for the project to be implemented, the government tax revenue would equal 387.6 million COP, and the economy gains 615.4 million COP. This reduction in corporate income taxes for the firm increased its financial NPV from 20.4 million COP to 227.8 million COP.

It is also important to note that the economic NPV with and without the income tax holiday incentive is the same as shown in Table C.1.5. The income tax holiday incentive is a tax transfer from the government (tax expenditure) to the firm exporting cotton yarn (tax benefit), hence is not an additional economic resource cost.

[18] Table C.1.5, column 3 equals column 1 minus column 2. Also, the summation of columns 3A, 3B and 3C equals column 3.

[19] The income tax holiday reduces the total income tax revenue to the government over the life of the project from 346.8 million COP to 139.4 million COP due to the tax revenue loss of 207.4 million COP to the firm.

VI. Summary of Analysis and Policy Recommendations

In an effective VAT refund system, whereby there are no delays in the VAT refunds, the corporate income tax holiday will increase the financial rate of return on the investment by 3% points from 12% to 15%.

From the economic perspective, this is a worthwhile investment with or without the tax incentive. However, if a tax incentive is given to enable the project to be undertaken, it is almost certain to yield a very substantial economic benefit to the country. The expected net economic benefit of 615.4 million COP is equal to about 266% of the wage bill, with an internal economic rate of return on the economic cost of the investment of approximately 21%.

This case illustrates the positive economic impact of policies to support an expansion of the export sectors of the economy. This conclusion is supported by many other studies of the benefits of tax policies that facilitate exporting firms.

C.2: Application of Cost Benefit Analysis of Tax Incentives in the Plastic Products Sector: Case Study of a Representative Firm Producing PVC Pipes - Import-Substitute Good

This analysis quantifies the impact of corporate income tax holiday and import duty exemption for a representative firm that produces PVC pipes. PVC pipes are importable goods in Colombia. Thus, the production of PVC pipes by the firm will reduce the imports of PVC pipes.

At present, there is a 25% rate of import tariff levied on imports and a 5 % import tariff on the inputs of PVC resin and other imported inputs that are used to make PVC pipes. There are no import tariffs on the machinery and equipment that will be used to manufacture these pipes. This trade policy already provides a substantial subsidy (incentive) for this import substitution activity.

I. Overview of Tax Incentives for Rubber and Plastic Products

Some investment incentives for firms that are in the Rubber and Plastic Products industry are as follows:

a) Custom duties exemption for importing operating inputs (PVC resin etc.).
b) Corporate income tax holiday for 1-5 years, depending on the location.

II. Project Description

The total investment cost for the PVC pipes project is estimated to be 1,193.4 million COP. The project is assumed to have an operating life span of 10 Years. The project financing debt-equity ratio is 60-40. The real interest rate charged on the loan is 4%. The investment will create employment for 25 workers. The proportion of the type of workers to the total labor employed for skilled, semi-skilled, and unskilled are 32%, 40%, and 28%, respectively. The project is assumed to pay the average market wage for its labor.

The capital costs indicate the uses of the funds including land lease, building & civil works, machinery & equipment, vehicles, and office furniture. In terms of investment financing, the loan equals 60% of the capital cost, which amounts to 716.04 million COP. The remaining 40% is financed by equity, amounting to 477.36 million COP.

III. Financial Analysis of the Impact of the Tax Incentive on a Firm Producing PVC pipes

The analysis begins with constructing a cash-based financial model for a firm producing PVC pipes in Colombia. The project output is PVC pipe (import-substitute good). The major input used by the project is PVC resin (importable input). The other inputs in producing PVC pipes are imported chemicals and domestically purchased water, electricity, and labor inputs. In addition, the project also incurs annual maintenance and repair costs during the project's operating period.

The project's sales of output and purchases of inputs are subject to a VAT of 15%. The project's input VAT payments are creditable against the value of VAT collected on output sales. It is the net amount that the firm must regularly deposit with the VAT administration.

The list of variables, technical coefficients, and assumptions used in the financial and economic models are presented in Table C.2.1.

Table C.2.1 PVC Pipes Case Study: Model variables, technical coefficients, and assumptions

Timing Assumptions	
Investment Year	Year 1
Operating Period	Year 2 – Year 11
Liquidation Period	Year 12
Capital Expenditures	
Machinery & Equipment	117,350USD
Land Lease, Building & Civil Works	578 million COP
Office Furniture	20.4 million COP
Vehicles	85 million COP

Financing	
Debt/Equity (ratio)	60-40
Supplier's credit	
Real Interest rate	4%
No of Installments	5 Years
Economic Depreciation	
Machinery & Equipment	10 Years
Building	25 Years
Tax Depreciation	
Machinery & Equipment	5 Years
Building	20 Years
Office Furniture	5 Years
Vehicles	5 Years
Production Output (Annual Meter)	
PVC Pipe (110mm)	34,200 Meter
PVC Pipe (160mm)	16,020 Meter
Major Direct Inputs	
PVC Resin	90 MT/Year
di-octyl phthalate (DOP)	2.75 MT/Year
Stabilizer	1.65 MT/Year
Colorant	1.50 MT/Year
Lubricant	0.56 MT/Year
Filler	8 MT/Year
Labor	
No. of Skilled	25
No. of Semi-Skilled	18
No. of Unskilled	7
Utility	
Electricity	481 MWh
Water	520 m^3
Maintenance & Repair (M&R) Cost	
Annual M&R cost (% of Capital Cost)	5%
Working Capital	
Accounts Receivable [as % of Gross Sales]	8%
Accounts Payable [as % of Total Input Cost excl. Labor]	8%
Cash Balance [as % of Total Operating Cost Incl. Labor]	8%
Tax	
VAT	15%
Corporate Income Tax	30%
Importable Goods	
PVC Pipes	25%
PVC Resin	5%
di-octyl phthalate (DOP)	5%
Colorant	5%
Discount Rate	
Financial (Equity)	12%
Economic (EOCK)	12%
Macroeconomic Parameter	
US Inflation rate (20 years average)	2.2%
Inflation rate (20 years average)	15%
FEP	6.5%

Source: Hypothetical analysis for illustrative purposes.

- **Base Case Model Analysis**

This base case scenario without any tax incentive aims to quantify the impact of the corporate income tax holiday and custom duty exemption on the return of the firm's investment. The following assumptions are established in this scenario:

a) The project's inputs and outputs are subject to VAT (15%).
b) Import duties are paid on imported inputs (no refund on the duties paid on inputs).
c) Profits are fully taxable (subject to corporate income tax of 30%).
d) It is assumed that without the tax incentive, the firm would be able to earn a real rate of return of 12%.

- **Base Case Model Result *"Without Tax Incentive"***

The net present value (NPV) after tax is estimated to be 13.6 million COP. The investment's internal rate of return (IRR) equals 12%. This rate of return is also equal to the firm's minimum required rate of return (financial discount rate).

The present value of the total corporate income tax paid during the operating period of the PVC pipes production project is estimated to be 258.4 million COP. In addition, the present value of the total amount of import duties paid on imported inputs is estimated to be 37.4 million COP.

Table C.2.2 Base Case Model Result "Without Tax Incentive"

	A. Private Investor's Perspective	
1	Financial NPV@12% (After Tax)	13.6 *M'COP*
2	Financial IRR	12%
	B. Government's Perspective	
3	PV Corporate Income Tax	258.4 *M'COP*
4	PV Import Tariff on Inputs	37.4 *M'COP*

- **Model Result *"With Corporate Income Tax Holiday and Import Duty Exemption on Inputs on the PVC Pipes Investment"***

In this analysis, we want to see the impact of a 5-year income tax holiday and the import duty exemption on the operating inputs used in the production of PVC pipes on the investment return to the representative firm producing PVC pipes. Table C.2.3 reports the results where the firm enjoys both the income tax holiday and the import duty exemption on the inputs simultaneously.

Table C.2.3 Model Result "With Income Tax Holiday & Import Duty Exemption"

		Without Tax Incentive	With Tax Incentive[20]
	A. Private Investor's Perspective		
1	Financial NPV@12% (After Tax)	13.6 *M'COP*	129.2 *M'COP*
2	Financial IRR	12%	14%
	B. Government's Perspective		
3	PV Corporate Income Tax	258.4 *M'COP*	180.2 *M'COP*
4	PV Import Tariff on Inputs	37.4 *M'COP*	0 *M' COP*
5	PV Tax Benefit to Firm		115.6 *M' COP*
6	PV Tax Revenue Impact on Gov't		-115.6 *M' COP*

The income tax holiday and import duty exemption increase the financial IRR by 2 percentage points from 12% to 14%. The firm's financial NPV net of tax increased from 13.6 million COP to 129.2 million COP. The tax benefit to the private investors and revenue loss to the government equals 115.6 million COP.

The present value of the total wage bill for this firm during the project's operating period equals 166.6 million COP. The total tax revenue loss equals 115.6 million COP. Hence, the tax revenue loss ratio to the firm's wage bill is approximately 69%.

This complete package of incentives and a 25% import duty on competing imports might be enough to induce an investor to enter the sector. As we will see from the economic analysis, if the private investor does go ahead and enters this sector, the economic resource losses to the country might be very substantial.

IV. Economic Analysis of the Impact of the Tax Incentive on a Firm Producing PVC pipes

The analysis evaluates the economic value of the output it creates and the economic resource cost of its inputs according to the incentivized investment.

The economic benefit generated by the project (by domestically producing PVC pipes) is the economic value of the resources saved by reducing the level of PVC pipe imports. Thus, the economic value of the output will reflect the import cost plus the foreign exchange premium saved

[20] Both the income tax holiday and import duty exemption on operating inputs at the same time.

by not having to import PVC pipes. The economic value does not include the inflated domestic price due to the 25% import tariff.

- **Economic Valuation and Conversion Factors**

This project produces import-substitute goods (PVC pipes), resulting in foreign exchange savings due to the reduced purchase of imported pipes. However, the project's most significant input (PVC resin) and other raw materials are imported, resulting in an outflow of foreign exchange used to purchase these imported inputs.

From the economy's perspective, the economic benefit of the project is the reduction in the value of the foreign exchange that was previously used to purchase the imported PVC pipes, augmented by the foreign exchange premium for Columbia. On the other hand, the increased imports of capital goods, resin and other imported inputs require foreign exchange. Hence, its economic cost is the value of the foreign exchange used to purchase this resin, also augmented by the foreign exchange premium. The cost of these imported components must be added to the costs of the other domestic inputs used in the project to arrive at the economic costs of the project.

The net tax revenue impact due to the change in import duty collections is equal to the import duty tax revenue gained by the project importing raw materials, less the import duty forgone due to the reduction in the quantity of PVC pipes being imported. At the same time, there is a gain in indirect taxes due to the reduction in the use of foreign exchange from imports of PVC pipes. This is measured by the rate of foreign exchange premium times these foreign exchange savings. On the other hand, there is a loss of indirect taxes from the importation of the project's inputs equal to the rate of foreign exchange premium times the foreign exchange costs of these inputs.

The methodology for calculating the economic conversion factors for the major input and output is presented in the following illustrative examples:

1. *PVC Pipe (Importable Output):* There is a 25% import duty levied on PVC pipes. The financial price must be adjusted for the import duty (T_m) tax revenue forgone to the government. Furthermore, the domestic sales of PVC pipe are subject to VAT; thus, the financial value must also be adjusted for this distortion. At the same time, there is a gain in indirect taxes due to the reduction in the use of foreign exchange from imports of PVC pipes. This is measured by the rate of foreign

exchange premium times these foreign exchange savings (1+ FEP). Thus, the conversion factor for a PVC pipe is estimated to be equal to 0.74, as expressed below:

$$\boldsymbol{CSCF_{PVC\ Pipe}} = \frac{Economic\ Value}{Financial\ Value} = \frac{1 + FEP}{(1 + T_m + VAT\ (1 + T_m)} = \frac{1 + 6.5\%}{(1 + 25\% + 15\%(1 + 25\%)} = \mathbf{0.74}$$

The conversion factor for PVC pipes is 0.74. Because of the import tariff, the economic value to the economy is less than the financial receipts received by the firm.

2. *PVC Resin (Importable Input):* The project's major input is PVC resin. There is a 5% import duty (T_m) levied on the imports of PVC resin. In addition, VAT of 15% is also levied on the CIF price plus import duty. The financial cost will be adjusted for both the import tariff and the VAT. The economic cost will be adjusted for the cost of foreign exchange due to the demand for foreign exchange to import PVC resin (1+FEP). Thus, the conversion factor for PVC resin is estimated to be equal to 0.88, as expressed below:

$$\boldsymbol{CSCF_{PVC\ Resin}} = \frac{Economic\ Cost}{Financial\ Cost} = \frac{1 + FEP}{(1 + T_m + VAT\ (1 + T_m)} = \frac{1 + 6.5\%}{(1 + 5\% + 15\%(1 + 5\%)} = \mathbf{0.88}$$

- **Economic Analysis Model Result**

Table C.2.4 shows that the economic NPV is estimated at negative 146.2 million COP with an economic rate of return of 9.6%. The negative result indicates that if this project were implemented, the economic cost of imports used in production would be greater than the economic value of the PVC pipes that the firm produces.

Table C.2.4 Economic Analysis Model Result

	Economic Perspective	
1	Economic NPV(@EOCK)	-146.2 *MIL'COP*
2	Economic IRR	9.6%

V. Stakeholder Analysis of the Impact of the Tax Incentive on a Firm Producing PVC Pipes

The movement of tax revenues from the government to the targeted private investors and vice versa is demonstrated in this analysis if the income tax holiday and import duty exemption cause the PVC pipes investment to be made.

- **Stakeholder Impact Summary Model Results**

Without the tax incentives, the difference between the economic NPV of -146.2 million COP and the financial NPV of 13.6 million COP indicates that the economy loses more than the private sector gains by 159.8 million COP. In this case, it is a total loss of tax revenue to the government of 159.8 million COP, as shown in Table C.2.5.

Table C.2.5 Stakeholder Analysis Summary Model Results – PV.EOCK@12%, million COP

		Economic (1)	**Financial** (2)	**Stakeholder Impact** (3) [21]	**Corporate Income Taxes** (3A)	**Personal Taxes** (3B)	**Indirect Taxes (3C)**
1	Without Tax Incentive	-146.2	13.6	-159.8	258.4	64.6	-482.8
2	With Income Tax Holiday & Import Duty Exemption	-146.2	129.2	-275.4	180.2	64.6	-520.2

The total tax revenue loss to the government equals 159.8 million COP is equal to the summation of the significant indirect tax revenue loss of 482.8 million COP due to the import duty tax revenue forgone on the project's output and tax revenue gain from both corporate and personal income tax paid.

The combined revenue impact of the income tax holiday and import duty exemption reduced the tax revenue collected by the government by 115.6 million COP. The income tax holiday reduced the tax revenue collected by the government from 258.4 million COP to 180.2 million COP. With the import duty exemption on operating inputs, the indirect tax revenue loss to the government increased by 37.4 million COP, from a negative 482.8 million COP to a greater negative value of 520.2 million COP. From the private investors' perspective, the tax benefit increased the financial NPV from 13.6 million COP to 129.2 million COP.

In summary, the negative tax impact on the government is due to the significant import duty on the imports being displaced by the project (i.e., a 25% tariff levied on each output) and a much lower tariff rate and value of imports of inputs to be used by the project.

[21] Table C.2.5, column 3 equals column 1 minus column 2. Also, the summation of columns 3A, 3B and 3C equals column 3.

VI. Summary of Analysis and Policy Recommendations

The analysis result of the impact of tax incentives for the PVC pipe project illustrates the risk of providing further incentives to promote and import substitution activity that is already receiving an incentive due to the structure of the tariff rates. The very high tariff rate of 25% increases the domestic price of the item far above the economic cost of importing it. This potentially creates a significant efficiency loss if the private sector decides to spend resources to set up an enterprise and produce in this sector. The result is an economically wasteful activity that also results in a significant loss of government revenue.

The expected economic resource loss from import substitution (PVC pipe factory) of 146.2 million COP equals about 88% of its wage bill. In contrast, the promotion of export activity, such as the production of cotton yarn, has significant economic benefits. The expected economic benefits to the economy of 615.4 million COP is 266% of its wage bill.

Providing tax incentives to promote investments can be very costly. Promoting investments in economically positive activities is important for sustainable employment and economic growth. In many cases, improving government administration that reduces the cost of business is more important than incurring more tax expenditures in the form of tax incentives.