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Abstract

Tax administrations (TAs) worldwide have increasingly been moving toward digitalization to increase process efficiency and service delivery. This technical note presents a methodology, and its application for the case of Chile, for evaluating the benefits and costs of a particular component of the TA's digital transformation: prefilling of value-added tax (VAT) returns. The analysis identifies and allocates the net benefits from both the financial and the economic perspectives considering two major stakeholders: the government and taxpayers. The results show that prefilled VAT returns could benefit TAs and taxpayers, with a reduction in taxpayers' compliance costs being a primary benefit. The application of the model to the Chilean case shows the economic net present value of the prefilling of VAT returns is US$5.66 billion, with a net benefit to the private sector of US$1.729 billion and a public sector or budgetary impact of US$3.391 billion. Sensitivity analyses show that the results are robust to changes in assumptions, except for the impact on government revenues from the change in taxpayer compliance. Overall, the results show that prefilling tax returns is an effective solution to high taxpayer compliance costs, the associated tax gap, and the risk of burdensome inspections, audit, and tax evasion.

JEL Codes: D61, H21, H26, H83
Keywords: cost–benefit analysis, tax compliance cost, tax administration, digitalization

Introduction

Tax administrations (TAs) in Latin American and Caribbean (LAC) countries have historically faced challenges in facilitating compliance and performing their activities efficiently, particularly regarding value-added tax (VAT) refunds. These challenges can be attributed to a range of factors, including complex tax systems, inadequate technological infrastructure, and limited resources for tax administration.

One of the main issues is the complexity of the tax system, which can make it difficult for taxpayers to understand their obligations and comply with the law. This complexity can also create administrative burdens for TAs. Furthermore, many TAs in the region lack the necessary technological infrastructure to efficiently manage tax information and processes. This can lead to errors and inconsistencies which can limit their ability to perform their activities efficiently. This results in backlogs of refund requests and a lack of capacity to process tax information in a timely manner. These challenges can have significant impacts on taxpayers, including businesses that rely on timely VAT refunds to manage their cash flow and invest in their operations.

Overall, deficiencies in facilitating compliance and performing tax administration activities efficiently can create a challenging environment for taxpayers and TAs alike. Digitalization initiatives, such as VAT prefilling, have the potential to address some of these challenges and improve tax administration processes in the region. The digital revolution has brought about tremendous changes in the way TAs operate across the globe. In recent years, TAs in LAC countries have been particularly impacted by digital transformation processes, which have created opportunities for more efficient and effective tax collection. However, despite the potential benefits, many TAs in the region still face significant challenges in facilitating compliance and performing their activities efficiently.

Digitalization has emerged as a powerful tool that can help to improve tax administration processes and services. In this context, it is important to understand the effectiveness of these digital initiatives in improving tax compliance and reducing administrative costs. This paper aims to contribute to closing this knowledge gap by presenting a cost-benefit analysis (CBA) of VAT prefilling in Chile. Through this analysis, we hope to shed light on the effectiveness of digital solutions in improving tax administration services and increasing compliance.

Finding a comprehensive strategy to enable efficient and prompt tax system modernization (TSM) is in the best interest of tax policymakers and administrators. One such strategy may be to digitalize tax administration, which would improve the institutional competence of TAs and encourage cognitive and behavioral improvements in taxpayers (Lee, 2016). With the help of practical, transparent, and reliable services, electronic administration would give TAs the tools they need to integrate tax data and cut tax compliance costs.

Digitalization is transforming TAs, helping to increase process efficiency and service delivery (Gupta et al., 2017). TAs have been forced to adapt to several significant changes due to an increase in the general population, shifts in economic conditions, the number of small and medium-sized taxpayers, and the complexity of tax law (Bellon et al., 2022). The implementation of electronic invoicing (e-invoicing), which allows for the automatic transfer of billing information between businesses and the TA, is an excellent example. E-invoicing has already been deployed in more than 50 countries worldwide, including 10 LAC countries (Barreix and Zambrano, 2018). However, considering the large volume of data collected by TAs in e-invoicing, particular emphasis must be placed on guaranteeing the safe use of complex digital technology (Campbell and Hanschitz, 2018).

This technical note presents the methodology for evaluating the potential benefits and costs of a particular component of the TA's digital transformation, that is, the administrative prefilling of VAT returns. The system of administrative prefilled VAT tax returns is made possible when a country can require all business transactions to be recorded on standardized electronic invoices. A copy of all these electronic invoices is stored in a central information system accessible to the TA. From this information, the tax authorities have access to all the information required to prepare a proforma VAT return. The proforma tax return is then electronically sent to the taxpayer to check for mistakes. If approved, the taxable entity is liable for the tax owed.

The prefilling of VAT returns is a development in taxation in several respects. Firstly, e-invoicing enables TAs to gather the sales information needed to prefill refunds. Another critical factor is the requirement to use government-mandated invoicing systems for data matching or verifying purchase invoices (Wolfers, 2019). Finally, some countries are implementing the requirement for real-time reporting of transaction-level data so that the government can receive data on a regular or real-

time basis. A recent example is a requirement that asks taxpayers to provide transactional data in a predefined auditable format to TAs in some European countries, such as Portugal and Norway. Prefilling helps to enforce policy adherence and prevent associated fines for negligence and failure to comply with tax responsibilities (Symons, Howlett, and Alcantara, 2010).

In undertaking a CBA, one must identify the potential benefits and costs of implementing such a TSM. Klun (2009) asserts that prefilled returns in Europe, particularly Slovenia, decreased compliance expenses by streamlining the compliance process. Similarly, prefilled returns guarantee that administrative and compliance costs are kept to a minimum for businesses operating within the EU. As a result, prefilling systems based on computers must be widely used (Deloitte, 2017; Dziemianowicz, 2017; Harju, Matikka, and Rauhanen, 2019; Poniatowski, Bonch-Osmolovskiy, and Smietanka., 2021). Gale and Holtzblatt (2003) cover the administration, complexity of tax reform, and importance of prefilling in reducing tax evasion in their work on the US tax system. Since compliance costs are a burden for an economy, tax simplification remains a fiscal policy priority and a key benefit of the prefilled VAT returns.

Prefilling VAT returns can bring significant benefits to both tax authorities and taxpayers. These benefits include increased tax compliance, reduced administrative burden, cost savings, improved tax transparency, and enhanced taxpayer experience. For taxpayers, prefilling VAT returns can reduce the compliance burden by eliminating the need for manual data entry and record-keeping, thus saving time and money. It can also reduce the cost of tax compliance by automating the tax return process, thus reducing the need for tax professionals and software. It can improve tax transparency by providing a clear and accurate overview of tax obligations and increasing trust in the tax system. Moreover, prefilling VAT returns can enhance the taxpayer's experience by simplifying the tax return process and improving relationships with tax authorities.

For tax authorities, prefilled VAT returns increase tax compliance by making it easier for taxpayers to file their taxes accurately and on time, reducing the risk of errors and omissions. This can lead to increased revenue collection for the tax authority. Secondly, prefilled VAT returns can lead to cost savings for the tax authority in terms of tax administration and enforcement. Finally, prefilled VAT returns can improve tax transparency by providing the tax authority with a clear and accurate overview of

taxpayers' tax obligations, making it easier to detect fraudulent activity and increasing the efficiency of the tax administration process.

In addition to the above, there are two other benefits that should be mentioned. Firstly, prefilling VAT returns can reduce the time taxpayers need to wait to obtain refunds for VAT credits generated in input purchases, which is particularly important for firms engaged in exporting. Secondly, prefilling VAT returns can help enhance or preserve public sector revenues, which is a key concern for both tax authorities and finance ministries.

While implementing a prefilled VAT return system may incur upfront costs for computer services, licensing, and personnel training for both tax authorities and taxpayers, the benefits of prefilling VAT returns are expected to outweigh the costs. Furthermore, tax authorities should invest in education and software licensing for several years after implementing the system to ensure its effectiveness.

This study uses an integrated investment appraisal (IIA) approach in conducting the CBA of prefilling VAT returns (Jenkins, Kuo, and Harberger, 2019). The approach integrates investment projects' financial (budgetary), economic, stakeholder, and risk analyses in one analytical model. The analysis identifies and allocates the net impacts (benefits or costs) that accrue to each stakeholder due to prefilled VAT returns versus traditional practices.

In 2003, Chile became the first LAC country to introduce e-invoicing (Koch, 2019). By 2019 the government required that all invoices be made through e-invoicing with a copy routed to the tax authorities (IDB, 2021). With comprehensive transaction information accessible to the tax authorities, it becomes possible for the TA to prepare prefilled VAT returns for the taxpayer's review and payment.

Pomeranz's (2015) study investigates the impact of third-party information on VAT enforcement in Chile and the role of the VAT paper trail in tax compliance. The study suggests that the use of technology and third-party reporting can improve tax collection and reduce tax evasion. Specifically, the study found that e-invoicing significantly increases tax compliance and revenue. The paper trail created by online billing systems or electronic receipts acts as a complement to audit probability and has a strong deterrent effect on tax evasion. The study also shows that firms subject to e-invoicing had higher VAT compliance rates than those of control groups, and the effect was even greater for firms that also received third-party information. Therefore,

the use of technology and third-party reporting can yield significant benefits for tax collection and reduce tax evasion.

Pomeranz (2015) argues that tax systems such as VAT, which generate more information for the tax authority by leaving a stronger paper trail, offer an advantage in tax collection over other tax forms such as retail sales tax. In addition, other mechanisms that furnish information to the government, such as online billing systems and electronic receipts, may yield significant benefits. However, more research is necessary to explore the effectiveness of these mechanisms and the extent to which these findings can be generalized.

Because Chile is already well advanced in the implementation of a system of administrative prefilling of VAT returns, it was selected as the example to illustrate how a CBA could be undertaken to evaluate the implementation of this intervention in a specific country. The application of the methodology in this example shows that the economic net present value (ENPV) of the prefilling of VAT returns is US$5.66 billion, with a net benefit to the private sector of US$1.729 billion and a public sector or budgetary impact of US$3.931 billion. Based on the given figures, the prefilling of VAT returns project in Chile is expected to have a significant impact on both the private and the public sectors. The ENPV of the project is estimated to be 8.76 percent of Chile's tax revenue. The private sector's share of these economic gains through higher net profits is approximately 2.58 percent of Chile's tax revenue (US$64.602 billion in 2021), while the public sector's share through the positive net revenue impact is around 6.08 percent of total revenue. These numbers show how the prefilling of VAT returns project potentially contributes significantly to the overall economy of Chile. The results of the CBA for the administrative prefilling of VAT returns indicates that this tax administrative intervention has great potential to generate net benefits to all the parties involved, the various groups of taxpayers, and the government Treasury. By reducing the compliance costs of the taxpayers and the administrative costs of the TA, the economy will also better utilize its scarce resources.

A review of the current literature demonstrates that there are still numerous areas that require attention if technology is to be well incorporated. The adoption of prefilled returns still faces diverse challenges that necessitate further research. No studies have looked at the magnitude of the economic benefits, nor at the impacts on different stakeholders, including tax groups by type (TA and taxpayers). This is critical

for securing buy-in from both the administration and the private sector for this major administrative reform. These challenges offer huge opportunities for researchers to participate by contributing to and exploring potential studies in these areas (For a summary of the literature review, please refer to Annex A.).

This technical note has five sections, including this introduction. Section 2 presents the methodology. Section 3 presents the application of the methodology for Chile, while Section 4 presents the sensitivity analysis. Finally, Section 5 concludes and discusses the main findings.

1. Methodology

This analysis begins with a set of assumptions about the situation without prefilled VAT returns. The economic opportunities created by the advancement of technology to reduce operating costs have led businesses and TAs worldwide to implement e-invoicing systems. In 2003, Chile became the first LAC country to grant legal validity to an e-invoice (Koch, 2019). Hence, this analysis assumes that such a system is already in place and is part of the without-project situation. This methodology is designed to evaluate the benefits and costs of a system of administratively prefilling the VAT tax return in a system where e-invoicing is widespread.

1.1. Approach

The analysis is conducted for 10 years using a CBA framework that is carried out from both a financial and an economic perspective. These perspectives differ in their focus and the factors that they consider.

The financial perspective of CBA is concerned with the direct financial costs and benefits of a project or policy decision. It evaluates whether a project will generate a net financial gain or loss for the organization. It considers factors such as investment costs, operating costs, and revenues. The financial perspective focuses mainly on the impact of interventions on an organization's net cash flow.

The economic perspective of CBA takes a broader view and considers the impact of the intervention on the resource saving and resource costs incurred because of the intervention. It evaluates the economic efficiency of a project or policy decision by measuring the overall impact on the use of resources and the value of the outputs of the intervention on society. For example, increases in personnel and computer costs for the TA are economic costs, while a reduction in these costs is an economic benefit. It is these economic resource costs and benefits that determine whether the economic welfare of society is improved or damaged by an intervention. At the same time, the increased revenue obtained by the government from this intervention is a financial benefit to the government and a financial cost to the taxpayers. These financial flows are neither economic benefits nor economic costs. Therefore, an economic appraisal is necessary to ensure that policy decisions consider the overall welfare of society and not just the financial benefits to any one or more organizations.

From this analysis, the impact on the stakeholders in the economy can be largely quantified. The major stakeholders are the government and the taxpayers. From the government perspective, there is the TA concerned with its costs and the National Treasury, whose primary focus is on the impact of such an innovation on the budget. The National Treasury's perspective includes both the administrative costs of implementing this system change and the change in tax revenues that it will follow. The main costs that a tax authority may incur are as follows:

- Technology costs: Tax authorities require a range of technological tools to manage and process tax returns, conduct audits, and track tax compliance. These may include computer systems, software, and databases.
- Infrastructure costs: Tax authorities require physical infrastructure such as office buildings, storage facilities, and communication networks to support their operations.
- Legal costs: Tax authorities may incur legal costs associated with enforcing tax laws and defending against legal challenges to their decisions.
- Outreach and education costs: Tax authorities may incur costs associated with educating taxpayers about their tax obligations, helping with tax filings, and conducting outreach programs to encourage voluntary compliance.
- Operating costs: Tax authorities may incur costs to enforce tax laws and combat tax evasion.
- Personnel costs: This includes the salaries and benefits of the employees of the tax authority, such as tax auditors, accountants, lawyers, and support staff as part of the legal, outreach and education, and operational functions of the TA.

Taxpayers can be broken down into large taxpayers, medium-sized taxpayers, small taxpayers, and micro taxpayers. CBA is often implemented in an aggregate manner because it provides a way to assess the overall impact of a project or policy decision. By aggregating the costs and benefits across all stakeholders, decision makers can determine whether a project or policy decision will have a positive or negative net economic impact on society. Such an analysis allows decision makers to compare different projects or policy options on a common scale. This can help to prioritize projects and policies that have the greatest net benefits for society.

However, it is important to note that aggregating costs and benefits does not mean that decision makers should ignore the differentiated effects by group. Instead,

they should use a distributional or stakeholder analysis to identify groups that may be disproportionately affected by a project or policy decision and develop measures to address their concerns. This ensures that the analysis is fair and equitable, and that the decision reflects the diverse preferences and needs of society.

If all stakeholders as a group are better off, then it must be the case that the economic impact of this intervention is a positive value. The net impacts (benefits or costs) accruing to each stakeholder due to prefilled returns versus traditional practices are quantified.

The integrated cost-benefit analysis (ICBA) approach is a single-model method used to assess the full range of impacts of a project or policy decision. It integrates financial, economic, stakeholder, and risk analyses into one financial model, making it easier to compare the impacts of different intervention or policy options. This approach provides a consistent and transparent methodology for assessing the impacts of a project or policy decision across different sectors and stakeholders. ICBA can help to ensure that the analysis is credible, and that decision makers identify the most efficient and effective options.

The integrated nature of the ICBA approach is particularly important for assessing the sustainability and economic viability of taxing systems and stakeholders. This is because many actors have different interests and varying levels of influence. The ICBA approach enables decision makers to understand the full range of impacts of a project or policy decision and identify the most efficient and effective options. The values in the ICBA model are expressed in 2022 U.S. dollars but can be easily converted to any currency. This flexibility makes ICBA a valuable tool for decision makers across the globe. The CBA is conducted on an incremental basis, wherein the budgetary and economic outcomes of the before-TSM taxation practices (referred to as the “without” scenario) are compared with the outcomes from the after-TSM practices (referred to as the “with” scenario). The difference between the “without” and “with” scenarios is used to evaluate the incremental impact of prefilled VAT returns in administrative and compliance costs on all the relevant actors and stakeholders.

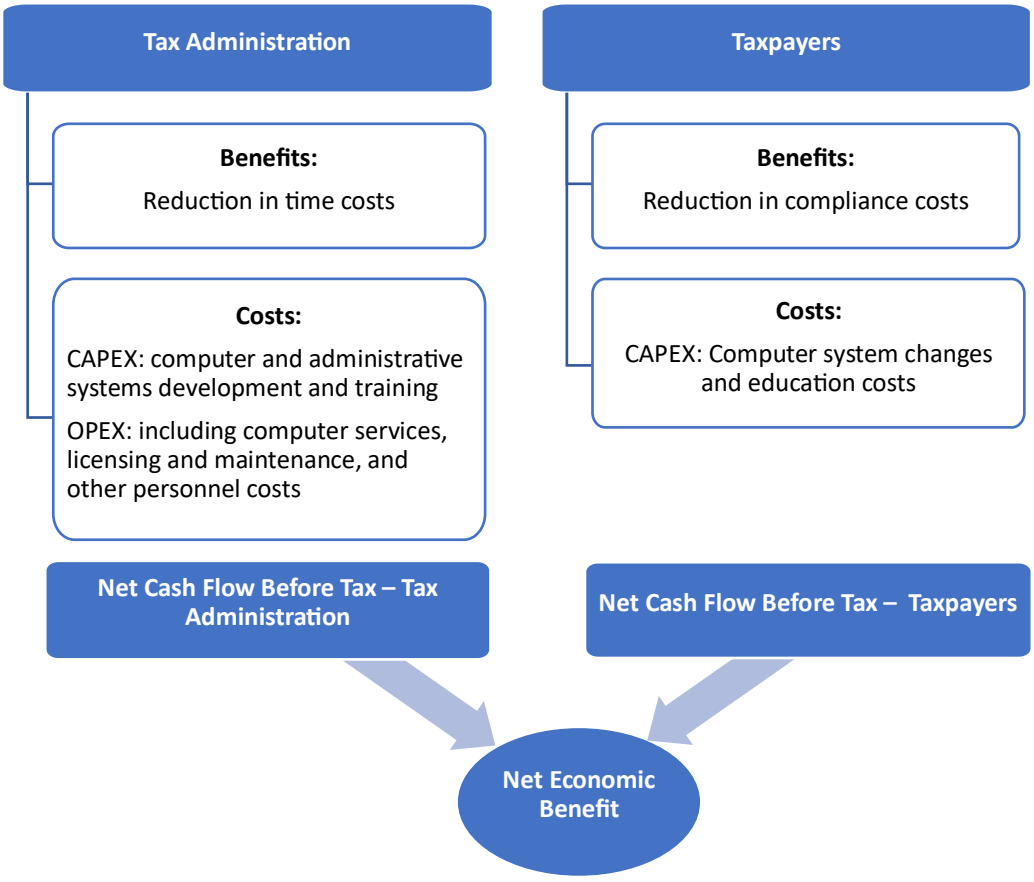
1.1.1. Economic Appraisal

CBA is a method for evaluating the effectiveness of investments in terms of their net economic benefit by comparing the discounted NPVs of benefits and costs. The

discounting process is crucial for tax administration changes that may need years of planning and implementation because it accounts for the fact that expenses often rise early on before a project is finished, but benefits typically show up later, long after the project has been implemented.

The conventional measurement of benefits in CBA has focused on the economic value of taxpayers' benefits in terms of the reduction in compliance costs and the benefits to TAs in the form of time saved by implementing prefilled returns. On the other hand, the main costs of implementing a prefilled VAT return system are the upfront costs of computer services, licensing, and personnel training for taxpayers and the TA. The tax authority should also invest in education and software licensing on a continuing basis after implementing the TSM. Using the two sets of parameter values for the estimation of the TSM, the ENPV is estimated as summarized in Figure 1.

Figure 1. Total Economic Perspective

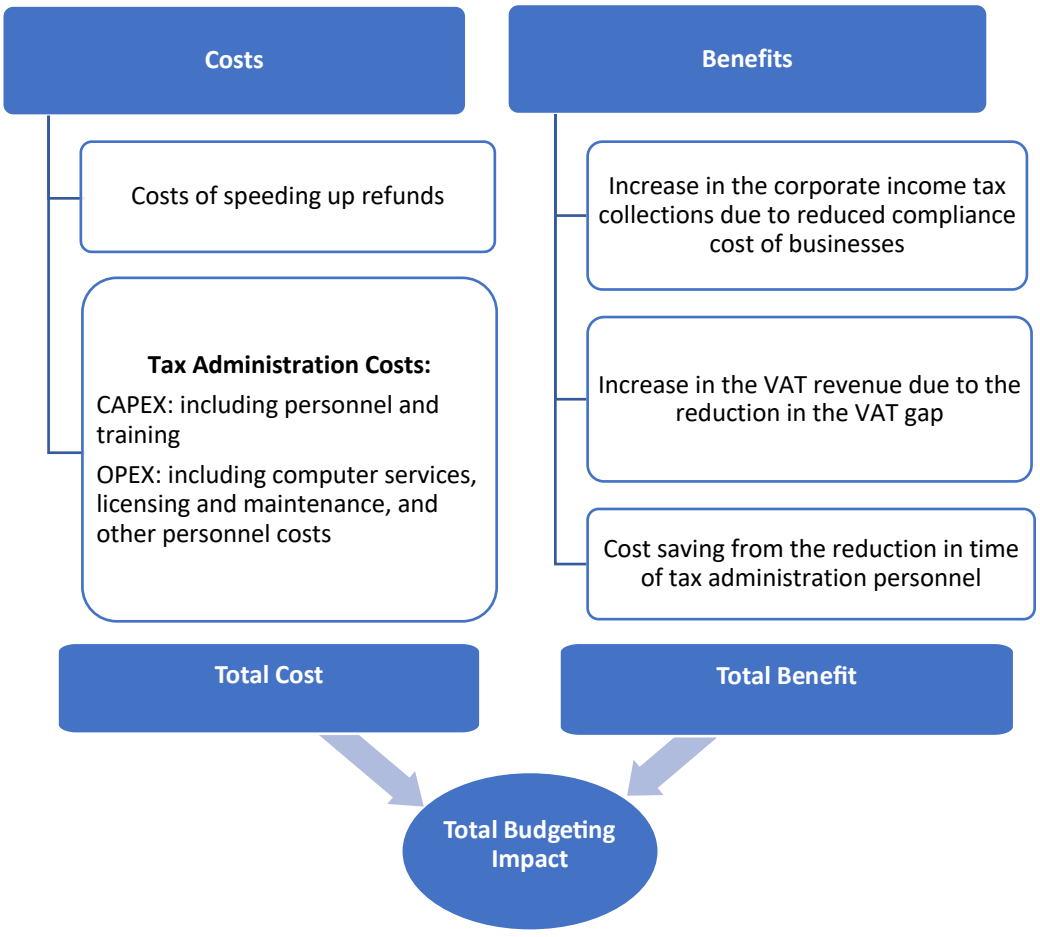


Source: Authors' elaboration.

1.1.2. Government Budget Perspective

The appraisal continues with an evaluation of the budgetary aspects of this intervention from the government's perspective, in terms of both revenue collections and the costs of tax administration. Certain immediate one-time costs of an investment nature are required to make this transition, such as training and information technology (IT), as well as the continued financing cost of speeding up refunds. The main budgetary benefits are an increase in corporate income tax (CIT) payments due to decreased compliance costs and an increase in VAT payments due to improved taxpayer compliance. Adding up these costs and benefits gives us the total budgetary impact of the prefilled VAT returns.

Figure 2. Government Budget Perspective

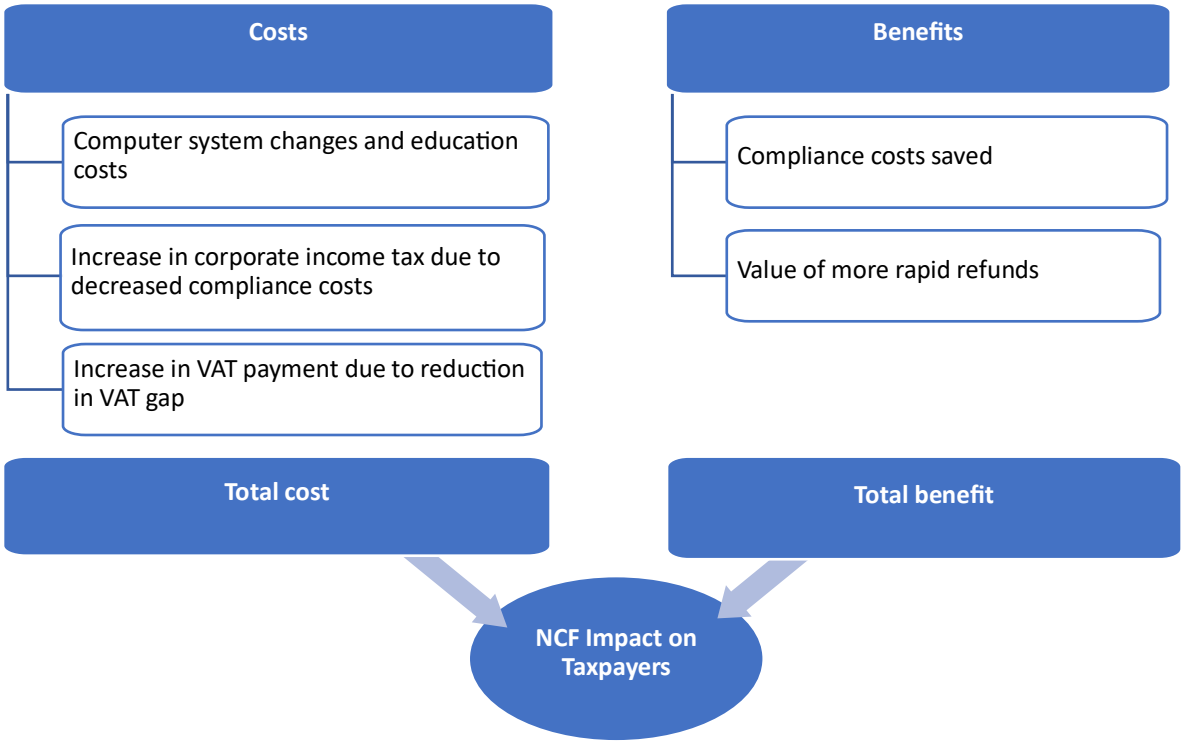


Source: Authors' elaboration.

1.1.3. Private Taxpayers' Financial Perspective

There will also be financial impacts on taxpayers. The main benefits of this project for taxpayers are its impact on reducing the compliance costs they incur and the value to them of the reduction of the waiting time for refunds of excess tax credits. On the negative side, they may need to incur some transitional costs to comply with the new system. Their CITs will increase due to the decrease in compliance costs, which will raise taxable income. They may also experience an increase in VAT payments if their level of compliance with the VAT laws is increased.

Figure 3. Private Sector Financial Perspective



Source: Authors' elaboration.

Finally, the TSM's budgetary and financial impact summation presents the project's ENPV. From the financial perspective, the NPV is the sum of the present values of incoming and outgoing cash flows over a period. The ENPV then looks at incoming and outgoing resources defined beyond just cash flows and described as benefit and cost resource flows, respectively.

Figure 4. Economic Net Present Value

Source: Authors' elaboration.

1.2. General Assumptions[1]

The present methodology is for a TA in which taxpayer invoices serve as the primary transactional data source. E-invoicing, which would eventually allow for prefilled VAT returns, is the foundation of this initiative. The TA should have access to sufficient data from third parties and VAT e-invoice reporting to allow cross-matching analyses.

The CBA of the prefilled returns identifies two possible positive aims of adopting prefilled VAT returns. From the TA perspective, the goal is to increase or maintain revenues so that they can be used to finance public spending. The second goal, which impacts the private sector, is to reduce the expenses the sector incurs to comply with VAT obligations. This is an important economic justification for implementing a system for prefilled VAT returns. As a result, a greater revenue yield, more efficient monitoring, and fewer audits are all advantages for TAs. Taxpayers gain from simpler processing, fewer mistakes, faster refunds, a fairer tax system, and lower costs associated with tax compliance.

For the CBA, the first parameter to estimate is the number of taxpayers by size, including large, medium, small, and micro taxpayers. The second parameter is an estimate of the compliance costs for each of these groups of taxpayers before and after the implementation of prefilled VAT returns.

For the TA, the primary economic benefit is the future reduction in administration costs. However, the increase in tax revenues, which is a fiscal transfer, can be considered an administrative benefit (not an economic benefit) to the TA because raising tax revenues is its central function in the operation of the government. The main cost categories for the TA are the investment and operating costs associated

[1] Key model parameters and their values for the Chilean case can be found in Annex B.

with this major change in how VAT is administered. Investment costs include the costs of personnel and training to design, plan, and implement the system. For personnel costs, the factors are the number of personnel, the hours worked, and their compensation per hour. Training costs are calculated by the number of training hours, the number of trainers and trainees, and their compensation.

The TA's incremental operating costs include computer upgrades, computer services, software licensing, and maintenance costs. In addition, the number of workers, wages, and annual working hours are calculated. For all groups of taxpayers, the cost of the computer system changes per firm and the training cost per firm are considered.

1.3. Features of the CBA Model

The following are key features of the CBA model:

- Economic benefits arise from the reduction of compliance costs for taxpayers and of the TA's costs.
- Economic costs arise from the investment and operating costs of bringing about the transformation of the TA system for collection of the VAT.
- After implementing the prefilled returns, the remaining compliance costs are incurred by taxpayers as they check the accuracy of the proforma return before making payment.[2]
- All reductions in taxpayers' compliance costs increase the taxable income of the firms subject to corporate/business income tax rates (25 percent for micro, small, and medium-sized enterprises (MSMEs) and 27 percent for large taxpayers).
- The change in the size of the VAT tax gap is an assumed variable. There is no empirical evidence to date on this parameter, but one would expect that with the TA having complete information, the gap would be reduced over time.
- The economic and stakeholder analysis is modeled for 10 years.
- According to Campos, Serebrisky, and Suárez-Alemán (2016), the "social discount rate and project evaluation" and the National Investment System of

[2] While there is a potential cost for making corrections after receiving prefilled VAT returns, the benefits of using prefilled VAT returns in terms of reducing compliance costs and improving accuracy are likely to outweigh this cost for most taxpayers over time.

the Ministry of Social Development Discount Rate are assumed to be 6 percent (Ministry of Social Development, 2017). This is the weighted average of the social rate of time preference and the rate based on the social opportunity cost of capital (Harberger method).

2. Case Study: CBA of Prefilled VAT in Chile

The case study illustrates the application of the methodology for prefilled VAT returns in Chile. Chile digitalized its financial reporting systems much earlier than other LAC countries. Although five LAC countries rank among the 10 most complex in the world for accounting and tax compliance, Chile scores well due to the digitalization of its financial operations. According to the annual Financial Complexity Index 2018 (TMF, 2018), Chile is ranked 35th out of 94 nations, down one place from the 2017 rankings but still far ahead of many of its regional neighbors, which are still in the early challenging stages of digitalizing their systems. Chile's tax system is competitive, heavily computerized, and based on tried-and-true commercial practices. In 2019, more than 65 percent of Chile's VAT returns were electronically prefilled. In other words, out of over 16 million VAT returns received by the tax office, more than 10.5 million were fully prefilled. In Chile, the frequency of VAT returns depends on the size of the business. Businesses with an annual income greater than 2,400 annual tax units (UTA[3]) are required to file monthly VAT returns. Businesses with an annual income less than or equal to 2,400 UTA are required to file quarterly VAT returns.

2.1. Distribution of Firms in Chile

As compliance cost is a function of the type of taxpayer, it is important to carry out this analysis based on the distribution of the firms by size (type). The distribution of firms by size is presented in Table 1. In Chile, large firms account for 1.4 percent and MSMEs account for over 98.6 percent of all enterprises. Specifically, 75.5 percent of all enterprises are microenterprises, 20.2 percent are small, and only 2.9 percent are

[3] UTA stands for "Unidad Tributaria Anual," which translates to "Annual Tax Unit" in English. It is a unit of measure used by the Chilean government to determine taxes and other fiscal obligations. The Chilean tax authority (Servicio de Impuestos Internos, SII) updates the value of the UTA annually and uses it to calculate various taxes and fees, such as income tax, VAT, and fines. As of March 2023, one UTA is equivalent to CLP 53,377.

medium-sized enterprises. Despite being few in number, large firms account for 86.9 percent of total sales, while MSMEs account for only 13.1 percent.

Table 1. Distribution of Firms by Firm Size in Chile, 2018

Firm size (annual turnover)	Number	%
Large (more than UF* 100,000)	14,749	1.4
Medium (UF 25,000 to UF 100,000)	29,265	2.9
Small (UF 2,400 to UF 25,000)	206,313	20.2
Micro (up to UF 2,400)	769,797	75.5
MSMEs (up to UF 100,000)	1,005,366	98.6
All enterprises	1,020,115	100

Source: Internal Tax Service (2019). This does not include firms not reporting sales.
*The "Unidad de Fomento" (UF) is an inflation-indexed unit of account, calculated and published by the Central Bank of Chile. It is authorized for pricing credit operations in national currency by banks and credit and savings cooperatives.

2.2. Value of Labor Time

A government employee in Chile typically earns around CLP 2,040,000 per month. Salaries range from CLP 1,080,000 (lowest average) to CLP 3,200,000 CLP (highest average) (Salary Explorer, 2022). For this work, large taxpayers' wages are considered to be 20 percent more than the average industrial wage, and SME taxpayers' wages are 10 percent less than the average industrial wage. Growth rates in real wages are assumed to be 2 percent for both the Internal Tax Service (Servicio de Impuestos Internos, or SII) and taxpayers.

Table 2. Value of Labor Time – CLP

Average hourly total cost for SII employees	11,292
Average hourly total cost for large businesses	6,775
Average hourly total cost for medium businesses	6,775
Average hourly total cost for small businesses	5,081
Average hourly total cost for micro businesses	5,081

Source: National Institute of Statistics, Chile.

2.3. Economic Resource Costs and Benefits Affecting Tax Administration

Prefilled returns would shift many of the compliance activities from the taxpayers to the TA. Taxpayers would have to upgrade their IT systems to accelerate the transfer

of data to the tax office to allow it to prepare prefilled returns without significant delays. The TA would presumably have to modify its IT systems to accommodate the timely preparation of these returns. Still, the TA should have lower processing costs overall under a prefilled return system, as the system is expected to result in fewer math errors and fewer taxpayer audits, and will facilitate the processing of refunds to taxpayers.

In the construction of the CBA model, it is assumed that the team implementing this system change are current TA members tasked with designing and implementing the new system. In addition to personnel time, there is expected to be a major one-time training effort undertaken by the TA. The breakdown of the various costs associated with implementing the prefilled VAT returns system is described in Table 3. One of the main administrative costs is the investment cost, including personnel and training costs to implement the prefilled VAT returns system. It is assumed that the TA employs 10 personnel as a "change management" team. These personnel will be trained for a total of 2,000 hours over five years. In addition to the change management team, the TA must train 50 people annually for 15 days each per year for five years. The number of training hours for each member of this group of employees is 120 hours per year, for a total of 6,000 hours of training for the group.

Table 3. Investment Costs for Tax Administration

Personnel costs (for five years of change management)		
Working hours	2,000	Hours
Number of workers	10	#
Training costs (50 people/year, 15 days each, for five years)		
Number of training hours/year	120	Hours
Number of trainees/years	50	#

Source: Authors' calculations.

For this case study, it was not possible to isolate the specific IT system costs for the prefilling of VAT returns. The total IT costs, including both capital investments and operating costs, is known historically for the Chilean TA. In the decade from 2009 through 2019 it amounted to an average of US$11.9 million annually, broken down into OPEX (operating expenditure), 60 percent, and investments in hardware, 40 percent

(IDB, 2021). Due to the nature of this function, it is expected that the TA will primarily use third-party operators of cloud computing services. These costs would be classified primarily as OPEX. As an overstatement of costs associated with the prefilling of VAT returns, the annual additional operating costs of the IT systems for prefilling VAT returns by the TA is assumed to be US$6 million, including US$5 million for computer services and US$1 million for software licensing and maintenance costs. This represents an increase of the total IT costs of the Chilean TA of about 50 percent (Table 4).

Table 4. Operating Costs for Tax Administration

Computer services cost	US$5 million
Software licensing and maintenance cost	US$1 million
Number of workers	20
Working hours (annual)	2,000

Source: Authors' calculations.

As indicated in Table 4, TA requires 20 employees to operate the system, with 2,000 working hours per year. For the management of the TA and tax audit, resources would be reallocated and trained to perform these functions. When the investment and operating costs are added up, the present value of the total cost over the 10-year period of the analysis becomes US$49.93 million.

In Chile, prefilled tax returns are expected to reduce the time spent on tax investigations. This change could save up to 40,000 hours annually (equivalent to the work of 20 people for a year). While a thorough analysis is necessary to determine the exact time savings, an estimated present value of US$3.68 million has been used to identify these benefits. This value is likely to be an underestimate of the actual time savings. Table 5 summarizes the breakdown of the costs and benefits associated with the use of prefilled tax returns in Chile. The "Inflows" section represents the present value of the estimated benefit of reducing tax administration time cost, which is US$3.68 million. The "Outflows" section includes investment costs such as personnel and training expenses, which amount to US$1.31 million, and operating costs of US$48.62 million. The total outflow is US$49.93 million. The NPV of tax administration is also negative, indicating that the cost of implementation outweighs the benefits. The

implementation of prefilled VAT returns is expected to cost US$46.25 million over the next decade, with an annual cost of US$6.23 million.

Table 5. Estimated Economic Benefits and Costs for Tax Administration (in millions of US$)

Inflows	PV
Time savings to tax administration	
Benefits arising from a reduction in time cost	3.68
Total inflows	3.68
Outflows	
Investment cost	
Personnel cost	1.01
Training cost	0.30
Total investment cost	1.31
Operating cost	
Operating cost	48.62
Total outflows	49.93
Net cash flow	**(46.25)**
Discount rate	6%
Tax administration – NPV	**(46.25)**
Annual average undiscounted savings (Year 2–Year 11)	**(6.23)**

Source: Authors' calculations.

2.3.1. Economic Resource Costs and Benefits Affecting Taxpayers

In the economic analysis that follows, the estimates of the financial values of resource costs incurred or saved have not been corrected for market distortions that might be present (e.g., indirect taxes). Also, in the case of the quantity of labor employed, no adjustment is made for changes in income social security taxes that might arise. In the case of Chile, the net value of these adjustments is likely to be quite small compared to the magnitudes of the value of the direct resources saved or costs incurred. However, in some countries the magnitudes of these market distortions might be significant and could alter the quantitative conclusions of the cost–benefit analysis. In such situations, a more comprehensive set of economic conversion factors might be justified to convert the financial values of the cash flow items into their economic

values. For a comprehensive methodology for constructing such commodity specific conversion factors, see Jenkins, Kuo, and Harberger, (2019).

2.3.2. Impact of Prefilled Returns on Compliance Costs of VAT

According to a study by Eurosocial (2015), tax transaction costs represented 0.96 percent of GDP in Chile in 2014. Of this total, 0.87 percent corresponded to taxpayer compliance costs and 0.086 percent to Chile's SII administration costs. The value of compliance costs before the implementation of the prefilled VAT return is a key parameter value for determining the benefits from the perspectives of both the economy and the private sector. Since the benefits are largely dependent on compliance costs, countries with high compliance costs will record higher benefits because of the reduction of these costs.

There is no specific set of estimated compliance costs for Chile prior to the TSM. Fortunately, the European Union (EU) has carried out an extensive estimation of these costs for various taxes, including VAT, for all the countries in the EU. We used this rich data source to develop a set of estimates that would be reflective of the current compliance costs for the VAT in Chile.

In 2021 Romania was one of the lowest-income countries in the EU, with a GDP per capita of US$14,861, while the GDP per capita in Chile was US$16,502 (European Commission, 2018). Both countries' populations are around 19 million. In terms of the compliance costs of VAT as a percentage of all taxes, Romania ranks at approximately the middle of the range for all EU countries (European Commission, 2018). After taking into consideration the similar levels of VAT gap, population, and GDP per capita, this study used the per-taxpayer compliance cost by taxpayer type for Romania as the basis for deriving an estimate of the compliance cost for the corresponding types of taxpayers in Chile prior to introducing prefilled tax returns.

Another approach to constructing these estimates of compliance costs was tested by taking a set of EU countries of approximately the same size as Chile but with higher GDPs per capita and then reducing their VAT compliance costs by the ratio of Chile's GDP per capita by the GDP per capita of EU countries. The weighted average-adjusted compliance cost using this benefit transfer method was very close to the reported VAT compliance costs for Romania. Hence, for simplicity's sake this paper

uses the reported compliance costs for Romanian taxpayers by type as the ex-ante situation for Chile (Table 6).

Table 6. Romania's Average VAT Compliance Costs/Year

	Mean value (US$)
Micro enterprises	645
Small enterprises	1,164
Medium-sized enterprises	2,285
Large enterprises	4,207

Source: European Commission (2018).

2.3.3. Savings in Compliance Costs

Introducing prefilled returns based on electronic invoicing will force taxpayers to accurately report their commercial activities. Prefilled returns will provide an even playing field for all firms. The TA's method of prefilled VAT reports is anticipated to reduce the overall compliance and administrative expenses incurred by taxpayers and the TA. According to the European Commission's (2018) report on tax compliance costs for SMEs, data collection is the most important driver of costs when it comes to VAT compliance. Related costs comprise about 30 percent of tax compliance costs for VAT, preparation costs about 29 percent, review costs about 24 percent, and submission costs the smallest proportion, 17 percent. It is assumed that compliance costs would rise annually by a real rate of 2 percent without the TSM. This is the same rate as the assumed increase in real wages.

After the TSM, by eliminating data collection, preparation, and submission costs, only 24 percent of the compliance costs remain for reviewing prefilled VAT returns. The prefilled VAT returns system is highly automated, and for taxpayers who are familiar with the system, there will be no additional cost for the submission of the VAT return. Because the new tax return is clearer and more closely tracks the typical business accounting system, there will be some time savings for some taxpayers. A comparison between the compliance costs of VAT for different taxpayers and the saved costs after the implementation of prefilled returns is presented in Table 7. As the results show, prefilled returns significantly reduce the compliance costs for taxpayers.

Table 7. Compliance Costs per Firm

	Compliance costs 2019 (US$)*	Saved compliance costs (US$)
Large taxpayers	4,206.7	3,197.1
Medium taxpayers	2,284.8	1,736.4
Small taxpayers	1,163.5	884.3
Micro taxpayers	645.1	490.3

* Source: EU KPMG Compliance Costs of SME 2018 (European Commission, 2018).

Since e-invoicing is already being implemented in Chile, it is assumed that there would be no additional investment costs in computer systems by businesses. This leaves the large taxpayers only with the training cost for selected employees. It is assumed that this investment cost affects 100 percent of large taxpayers and includes 200 hours/year of training for three employees for five years.

For other taxpayers, the investment cost is 80 hours of training for two employees for five days for medium taxpayers and 40 hours for one employee for five days for small and micro taxpayers. Table 8 presents the summary of investment costs by types of taxpayers. The model estimates that there will be no operating costs for prefilling by taxpayers. This is understandable as the TA is taking over the function of preparing the tax return.

Table 8. The Investment Cost for Taxpayers

	Large taxpayers	Medium taxpayers	Small taxpayers	Micro taxpayers
Cost of computer system changes per firm (US$)	0	0	0	0
Training cost per firm (hours)	200	80	40	40
Number of trainees	3	2	1	1
Percentage number of large taxpayers affected (%)	100	100	100	100

* Training will take five days.
Source: Authors'calculations.

Table 9 provides an analysis of the estimated economic benefits and costs of implementing a tax reform aimed at reducing compliance costs and processing times for taxpayers in different categories. The inflows represent the estimated benefits to taxpayers resulting from the reduction of compliance costs and the time savings associated with filing tax returns and receiving refunds. Meanwhile, the outflows

represent the estimated costs of implementing the reform, including investment costs for personnel and training, as well as operating costs.

To calculate the net resource flow before taxes, the total outflows are subtracted from the total inflows for each taxpayer category. The NPV is calculated using a discount rate of 6 percent to estimate the value of future cash flows in today's dollars. The annual average undiscounted savings in years 2–11 represents the estimated average annual savings for taxpayers in each category over a 10-year period without adjusting for the time value of money.

2.3.4. Distribution of Estimated Economic Benefits and Costs

Large Taxpayers

The benefits arising from reducing the compliance costs for the completion of tax returns and the reduction of time required for receiving refunds in present value terms are estimated to amount to US$426 million. After subtracting the total investment and operating costs of US$20 million, the present value of savings over 10 years is US$406 million, resulting in annual average undiscounted savings of US$59 million.

Medium Taxpayers

The benefits arising from the reduction in the number of hours saved from fewer inquiries and the value of time saved because of the reduction in time receiving refunds are estimated to have a present value of US$459 million over 10 years. Combining this with the present value of costs of US$20 million, the net result for medium taxpayers is a positive NPV of US$439 million, or an annual net benefit of US$64 million.

Small and Micro Taxpayers

The present value of the benefits arising from the reduction of compliance costs from the completion of tax returns and the reduction in time receiving refunds for small and micro taxpayers is US$1.649 billion and US$3.411 billion, respectively. The estimated investment cost for small taxpayers is US$42 million and for micro taxpayers US$156 million. After deducting the total investment and operating costs of small and micro taxpayers, the savings over 10 years would amount to US$1.607 billion and US$3.254 billion, respectively, or an annual average savings of US$228 million and US$472 million, respectively.

Table 9. Estimated Economic CBA for Taxpayers (in millions of US$)

	NCF before tax	NPV	Annual average undiscounted savings (Year 2–Year 11)
LARGE TAXPAYERS		406	59
Inflows			
Benefits arising from the reduction of compliance costs from the completion of tax returns	426		
Outflows			
Total investment costs	20		
MEDIUM TAXPAYERS		439	64
Inflows			
Benefits arising from the reduction of compliance costs from the completion of tax returns	459		
Outflows			
Total investment costs	20		
SMALL TAXPAYERS		1,607	228
Inflows			
Benefits arising from the reduction of compliance costs from the completion of tax returns	1,649		
Outflows			
Total investment costs	42		
MICRO TAXPAYERS		3,254	472
Inflows			
Benefits arising from the reduction of compliance costs from the completion of tax returns	3,411		
Outflows			
Total investment costs	156		
Implications of improved compliance for taxpayers			
Total ENPV from reduction in compliance costs of taxpayers: 5,706			

Source: Authors' calculations.

Overall Economic Perspective

The ENPV is the sum of the economic impacts across all groups of stakeholders (government and taxpayer groups) and is estimated to be US$5.66 billion, with an annual value of net benefits of US$817 million after the first year of implementation. It is important to note that the internal rate of return statistic (IRR) should be used with caution in describing the economic productivity of such an investment. However, for this analysis, the IRR has been calculated and is reported in Table 10 with a value of 288 percent. The sensitivity analysis reported in Section 4 analyzes the impact of the key input variables on the outcomes of this analysis.

Table 10. Economic Perspective (Millions of US$)

1. Tax administration	
Tax administration – NPV	(46.25)
Annual average undiscounted savings (Year 2–11)	(6.23)
1. Large taxpayers	
Large taxpayers – NPV	406
Annual average undiscounted savings (Year 2–11)	59
2. Medium taxpayers	
Medium taxpayers – NPV	439
Annual average undiscounted savings (Year 2–11)	64
3. Small taxpayers	
Small taxpayers – NPV	1,607
Annual average undiscounted savings (Year 2–11)	228
4. Micro taxpayers	
Micro taxpayers – NPV	3,254
Annual average undiscounted savings (Year 2–11)	472
5. Consolidated economic perspective	
Economy – NPV	5,660
Economy – IRR	288%
Annual average undiscounted savings (Year 2–11)	817

Source: Authors' calculations.

2.4. Estimation of Stakeholder Impacts

When businesses pay VAT on their purchases or inputs, they are entitled to claim refunds for the VAT they have paid. These refunds are typically used to offset the VAT they have collected from their sales or outputs. Businesses (including exporters) are the primary stakeholders in the process of VAT refunds. Timely receipt of these refunds is crucial for their cash flow management, financial stability, and business operations. The tax authorities are responsible for administering VAT refunds and reimbursements processes. They set the rules and regulations governing VAT refund claims, process the claims, and disburse the refunds to eligible businesses. They also have the authority to verify the validity of refund claims and may conduct audits or investigations to ensure compliance with VAT regulations.

By eliminating the need for businesses to claim VAT refunds separately, prefilled VAT returns can streamline the VAT compliance process and reduce the delays and complexities associated with VAT refunds. This can be particularly beneficial for businesses with limited resources. It can also reduce the potential for errors or

mistakes in VAT refund claims, as the prefilled information is based on data already available from the tax authorities.

2.4.1. Impact of Faster Refunds

The input tax credit and the timely refunding of excess credits are essential features for the efficient operation of a VAT system. However, many VAT systems have ineffective refund processes due either to delayed refunds by the government or to misrepresentations by exporters regarding the amounts due to them (Jenkins and Kuo, 2017). Exporters, who are most affected by this problem, may claim back all the taxes paid on input purchases if they are zero-rated.

The cost to private businesses of delayed refunds includes the cost of capital for the number of days between when the VAT was paid on the inputs and when the firm receives the refund, multiplied by the amount of the refund. Such delays in issuing refunds have a negative impact on the competitiveness of the export sector. For example, before implementing the prefilling of VAT returns, it took 38 weeks to obtain a VAT refund in Chile, according to the World Bank Group (2019). This results in businesses losing out while the government obtains free financing for the period of delay.

Table 11 provides data on the potential financial benefits of reducing the time it takes to process refunds for different categories of taxpayers. It includes information such as the estimated compliance cost savings, the average value of refunds per year, the reduction in refund processing time per year, and the percentage of taxpayers that would be affected by the reduction. The estimated compliance cost savings range from US$3,197.1 for large taxpayers to US$490.3 for micro taxpayers, and the average value of refunds per year ranges from US$100,000 for large taxpayers to US$10,000 for micro taxpayers. The reduction in refund processing time is assumed to be 30 days per year for all categories of taxpayers, and 10 percent of taxpayers would be affected by the reduction, regardless of the category.

Prefilled VAT returns, made possible through e-invoicing of negative payments, can benefit the government by reducing the cost of reviewing refunds and processing time. The efficient data collection process eliminates the need for manual data entry, allowing for automated processing and accurate calculations. This leads to reduced review time as the system can quickly verify data against predefined rules, expediting

the refund process. Moreover, the cost savings achieved through minimized manual tasks and reduced review time contribute to the overall efficiency and effectiveness of the VAT refund process.

Speeding up tax refunds can be seen as a financial benefit to taxpayers who are expecting refunds, as it provides them with earlier access to funds, which can reduce their financing needs. Businesses in particular can lower their financing costs, improve their cash flow, and better manage their working capital by receiving timely refunds, which can contribute to their overall financial health and competitiveness.

By issuing refunds more quickly, the government is essentially transferring funds back to taxpayers that were previously held as overpaid taxes. These funds, when they were held by the government, represent a financing subsidy paid for by the private sector waiting for their refunds. The quicker refunds will cause the government to bear an increase in its financing costs, such as interest on increased borrowing, as it needs to replace the refund of VAT credits with other sources of finance.

Based on these results, it appears that micro taxpayers would receive the greatest benefits from a reduction in the time it takes to receive tax refunds. This suggests that faster tax refunds would have a significant positive impact on micro taxpayers, potentially providing them with quicker access to funds that they can use for various purposes, such as consumption, investment, and more.

Table 11. Financial Benefits of Reduction of Time for Receiving Refunds

	Large taxpayers	Medium taxpayers	Small taxpayers	Micro taxpayers
[1] Compliance costs 2019 (US$)*	4,206.7	2,284.8	1,163.5	645.1
[2] Reduction in compliance costs (as a % of compliance cost)**	76%	76%	76%	76%
[3] Saved compliance costs (US$)	3,197.1	1,736.4	884.3	490.3
[4] Value of average refund/year (US$)	100,000	30,000	20,000	10,000
[5] Number of days/year reduction	30	30	30	30
[6] Percentage of taxpayers affected	10%	10%	10%	10%
[7] Financial benefits to taxpayers arising from reduction of time for receiving refunds (millions of US$)	6	3.5	16.5	31
[8] Total increase in financing cost for public sector from faster refunds to taxpayers (millions of US$)				57

* Source: European Commission (2018).

** Reduction in compliance costs: Eliminating all the costs except reviewing "EU KPMG Compliance Costs of SME 2018," (Europuean Comission, 2018, Table 67).

2.4.2. Impact on Corporation Income Tax Payments

Because of the reduction in the administrative cost of VAT for taxpayers, the total present value of the cost saving over 10 years for the private sector would be US$5.706 billion (Table 9). As a result of the decrease in compliance costs for enterprises, it is anticipated that corporate taxable income will increase by the same amount. This would mean that taxpayers would experience an estimated increase in taxable income of US$1.435 billion over a 10-year period (Table 12, row 11).

2.4.3. Impact of Increased Compliance on VAT Revenues

Prefilling returns may also alter some tax compliance incentives. It may incentivize taxpayers to correct what they believe is an overestimate of their VAT liability but to accept an underestimation, thus expanding the tax gap. However, any revenue loss from this misrepresentation could be compensated to some extent by the collection of tax from noncompliant taxpayers who owe taxes and are issued prefilled returns.

Any increase in taxpayer compliance with the VAT laws leading to a reduction in the current VAT gap from 21.4 percent (OECD, 2020) will impact government revenue. At this point, the estimated increase in VAT revenue is a speculative value. However, with the TA responsible for completing the VAT returns and transaction information available, the VAT gap is expected to shrink over time. In this illustrative example, we assume that the VAT gap will shrink by two percentage points from 21.4 percent to 19.4 percent. According to OECD Revenue Statistics (OECD, 2021), in 2020 the VAT revenue collection in Chile was US$15.963 billion. This assumption implies that the value of VAT revenue will increase by US$2.6 billion during the 10 years (Table 12, row 13).

Table 12. Private Financial Costs and Benefits

		Millions of US$
[1]	NPV of financial gains from reduction in taxpayer compliance costs	5,706
Financial benefits from faster refunds		
[2]	Large taxpayers	6
[3]	Medium taxpayers	3.5
[4]	Small taxpayers	16.5
[5]	Micro taxpayers	31
[6]	Total financial benefits from faster refunds	57
Increase in CIT Payments		
[7]	Large taxpayers	110
[8]	Medium taxpayers	110
[9]	Small taxpayers	401
[10]	Micro taxpayers	814
[11]	Total increase in CIT payments	(1,435)
[12]	**Net cashflow impact on taxpayers – net of faster refunds and CIT**	**4,328**
[13]	Increase in present value of VAT revenues from increased compliance	(2,600)
[14]	**Net cash flow impact on taxpayers – net of tax**	**1,729***
[15]	Average net cash flow impact on taxpayers – net of tax	208

*Due to rounding, the displayed total may not precisely match the sum of the rounded values.
Source: Authors' calculations.

The net cash flow impact on taxpayers is calculated by taking the total economic NPV from the reduction in compliance costs of taxpayers of US$5.706 billion (shown in Table 12, row 1), adding the total financial benefits from faster refunds (row 6). From the total of these benefits it is necessary to subtract the total increase in CIT payments (row 11) and the increase in the present value of VAT revenues from increased compliance (row 13). The estimated present value of the net cash flow impact on the taxpayers over 10 years is US$1.729 billion, with an annual average undiscounted value of US$208 million (Table 12, rows 14 and 15).

2.5. Government Budget Perspective

Table 13 provides insights into government budgeting, specifically focusing on revenues and expenses. Row 1 in the table represents the NPV of the TA, which is calculated as a negative value of US$-46 million. This indicates that the TA is projected to have a net cost of US$46 million. Row 3 shows the total costs associated with

speeding up refunds for private investors, which amounts to US$57 million. This includes the expenses incurred from expediting the refund process. Additionally, the table reports an annual average change in these costs, calculated as US$8 million. This is the average increase in costs per year of expediting refunds (row 4).

Table 13 also provides analysis related to CIT revenue. It records an increase of US$1.435 billion in tax revenues due to the increase in CIT collections from the higher reported taxable income (row 5). The annual average change in CIT tax revenue is reported as US$207 million (row 6). Row 7 presents the estimated total budgetary impact (before considering the increase in VAT compliance) as US$1.332 billion. This is the net effect on the budget considering all the factors except improved VAT compliance. Lastly, row 8 shows the present value of the increase in VAT revenues due to improved compliance, estimated at US$2.6 billion. The annual average change in VAT revenue from better compliance by the taxpayers is reported as US$357 million (row 9). The present value of the total budgetary impact considering all the factors is reported as US$3.931 billion (row 10), with an annual impact of US$550 million. This reflects the combined effect of all the estimated impacts on the government budget.

Table 13. Government Budgeting (revenues and expenses)

Tax administration analysis	PV (millions of US$)
1. Tax administration - NPV	(46.25)
2. Annual average undiscounted savings (Year 2–Year 11)	(3.23)
Cost of speeding up the refunds for private investors	
3. Total costs arising from speeding up the refunds for private investors	(57)
4. Annual average change in costs of speeding up the refunds	(8)
CIT revenue analysis	
5. Increase in tax revenues (due to the increase in CIT collections)	1,435
6. Annual average change in tax revenue "CIT"	207
7. Total budgetary impact before increasing VAT compliance	1,331.75
VAT gap	
8. Increase in VAT revenues (due to improved compliance)	2,600
9. Annual average change in VAT revenue	357
10. Total budgetary impact	3,931*
11. Annual average change in budget net revenue	550

*Due to rounding, the displayed total may not precisely match the sum of the rounded values.
Source: Authors' calculations.

3. Sensitivity Analysis

A sensitivity analysis of the key model parameters was conducted to examine the impact of changes in the value of these input parameters on the project's final outputs. The variables used in this sensitivity analysis are taxpayer compliance costs, computer services costs, the annual number of hours saved by the TA, the value of time of receiving refunds, and the change in VAT revenue due to improved taxpayer compliance.

Compliance Costs

Table 14. Compliance Costs

	Total economic perspective			Government budgeting		Private – financial	
	NPV	Average annual savings	IRR	NPV	Average annual savings	NPV	Average annual savings
	1	2	3	4	5	6	7
	5,660	816.98	288%	3,931	549.52	1,729	201.52
–30%	3,876.85	570.02	202%	3,482.83	487.42	394.02	47.46
–20%	4,471.34	652.34	231%	3,632.31	508.12	839.04	98.81
–10%	5,065.84	734.66	260%	3,781.78	528.82	1,284.06	150.16
0%	5,660.34	816.98	288%	3,931.26	549.52	1,729.08	201.52
10%	6,254.83	899.30	317%	4,080.73	570.22	2,174.10	252.87
20%	6,849.33	981.63	346%	4,230.21	590.92	2,619.12	304.22
30%	7,443.83	1,063.95	374%	4,379.69	611.62	3,064.14	355.58

Source: Authors' calculations.

Taxpayer compliance costs with respect to VAT are a key determinant of the benefits for the economy, government budgeting, and taxpayers. In the base case, the economy of Chile will be better off by implementing this intervention, with an NPV of US$5.66 billion over 10 operating years of this new system. These benefits are distributed with a PV of US$3.93 billion going to the government budget and a PV of US$1.73 billion to private sector firms. The estimated IRR for the base case is 288 percent. If we were to assume that the compliance costs for the VAT was 30 percent lower than our assumed values, the ENPV is still a positive PV of US$3.87 billion, with

a PV of US$3.48 billion accruing to the government and a PV of US$0.39 billion gained by private taxpayers.

Computer Services Costs

Table 15. Cost of Computer Services

	Total economic perspective			Tax administration		Government budgeting	
	NPV	Average annual savings	IRR	NPV	Average annual savings	NPV	Average annual savings
	1	2	3	4	5	6	7
	5,660	816.98	288%	(46.25)	(6.23)	3,931	549.52
–30%	5,671.38	818.48	289%	(35.21)	(4.73)	3,942.30	551.02
–20%	5,667.70	817.98	289%	(38.89)	(5.23)	3,938.62	550.52
–10%	5,664.02	817.48	288%	(42.57)	(5.73)	3,934.94	550.02
0%	5,660.34	816.98	288%	(46.25)	(6.23)	3,931.26	549.52
10%	5,656.66	816.48	288%	(49.93)	(6.73)	3,927.58	549.02
20%	5,652.98	815.98	288%	(53.61)	(7.23)	3,923.90	548.52
30%	5,649.30	815.48	288%	(57.29)	(7.73)	3,920.22	548.02

Source: Authors' calculations.

The cost of computer services is one of the most significant new cost items that TAs must incur to implement the new system for VAT administration. In the base case, a generous estimate of the incremental cost of consumer services is used. Even if these base case estimates were increased by 30 percent, we find that the economic NPV falls only from a PV of US$5.66 billion to a PV of US$5.65 billion (Table 16, col. 1).

Annual Number of Hours Saved – Tax Administration

Table 16. Annual Number of Hours Saved – Tax Administration

	Total economic perspective			Tax administration		Government budgeting	
	NPV	Average annual savings	IRR	NPV	Average annual savings	NPV	Average annual savings
	1	2	3	4	5	6	7
	5,660	816.98	288%	(46.25)	(6.23)	3,931	549.52
-	5,656.66	816.48	288%	(49.93)	(6.74)	3,927.58	549.02
20,000	5,658.50	816.73	288%	(48.09)	(6.49)	3,929.42	549.27
40,000	5,660.34	816.98	288%	(46.25)	(6.23)	3,931.26	549.52
60,000	5,662.18	817.23	288%	(44.42)	(5.98)	3,933.10	549.77
80,000	5,664.02	817.49	288%	(42.58)	(5.73)	3,934.94	550.02

Source: Authors' calculations.

An important potential cost savings arising from this intervention is the saving in time of the TA personnel. In the base case, it was assumed that 40,000 person hours would be saved each year. If the amount of personnel time saved was doubled to 80,000 hours, the net cost of the intervention from the perspective of the TA would fall from a PV of 46.2 million to 42.6 million. This value is reflected in an increase in the economic NPV and an improvement in the government budget of the same amount.

Change in VAT Revenue due to Improved Taxpayer Compliance

Table 17. Change in VAT Revenue due to Improved Taxpayer Compliance

	Government budgeting		Private – financial	
	NPV	Average annual savings	NPV	Average annual savings
	1	2	3	4
	3,931	549.52	1,729	201.52
0.0%	1,331.63	192.95	4,328.71	498.66
0.5%	1,981.54	282.09	3,678.80	424.38
1.0%	2,631.44	371.23	3,028.89	350.09
1.5%	3,281.35	460.38	2,378.99	275.80
2.0%	3,931.26	549.52	1,729.08	201.52

Source: Authors' calculations.

Table 17 shows that the changing of the overall taxpayer compliance with respect to their VAT legal obligations had a dramatic impact on the government budget and at the same time an offsetting effect on the net cash impact on private taxpayers.

4. Conclusions and Discussion

In recent years, businesses and TAs worldwide have increasingly been moving toward digitalization to increase process efficiency and service delivery. This technical note presents the methodology, and its application in Chile, for evaluating the potential benefits and costs of a particular component of TAs' digital transformation, that is, the administrative prefilling of VAT returns. The CBA of prefilled VAT returns identifies potential beneficial objectives of implementing such a TSM. One reason to carry out prefilled VAT returns is to reduce the economic costs associated with the administration of and compliance with VAT legislated obligations.

According to our results, prefilled returns could benefit the TA and taxpayers. A primary incentive for adopting prefilled return filing is the reduction in taxpayer compliance costs that can arise from such an intervention. This reduction would stem from decreases in taxpayers' time and money to file their returns. The results also show that the savings in compliance costs for taxpayers using prefilled returns are higher than the net administrative costs of the program. There is a significant benefit in the form of a net cash flow impact on taxpayers due to the reduction in compliance costs, which is US$5.706 billion in a 10-year period.

The results also show that the revenue impact arising from the change in CIT revenue for the government is US$1.435 billion, which is 31 times more than the budgetary cost of implementing a prefilled returns system. Another reason for implementing such a TSM is to enhance or preserve revenues so that they are available to finance public expenditures. In the case of Chile, the potential budgetary impact of implementing prefilled returns is an increase in PV of US$3.931 billion.

Whether the TA should prefill tax returns for taxpayers raises several policy considerations. These include the potential cost savings from using such a system, the number of taxpayers who might benefit, and the implications for taxpayer compliance and the VAT gap.

Prefilling tax returns involves the government utilizing information from the e-invoicing system to fill out some or all tax returns. Its aim is to ensure that each taxpayer pays the right amount of taxes, including the timely refund of legally approved excess tax credits. Prefilling returns is expected to decrease expenditures on tax administration due to tax simplification. It should result in fewer mistakes, less time spent by the tax authority in resolving disputes, and a better ability to verify each taxpayer's status.

A series of sensitivity analyses was carried out. Apart from the impact on government revenues from the change in taxpayer compliance, the results are very robust. However, as this change in the way VAT is administered is a major reform, care must be taken that both the TA and the body of private taxpayers are prepared for these administrative changes.

To increase the probability of successfully implementing this intervention, a comprehensive simplification of the tax law may be required. Therefore, the tax authority should conduct a wide-ranging review of the reduced rate and exemption schedules. It is important to work toward simplicity of the tax system; complex tax systems favor evasion and non-compliance, as they create ambiguity about the scope of tax regulations, increase control costs, raise compliance costs, and develop the mechanisms of non-compliance. Policymakers should recognize that the key component of the new trend in tax technology is the ability to supply the tax authorities with real-time information on transactions (invoices issued) and to prefill returns and handle refunds on behalf of taxpayers. Real-time data enable the tax office to perform certain tax checks, allowing for prompt response in the case of any dubious suppliers. More importantly for businesses, this saves time and money by shifting the task of tax return preparation to TAs. This technical note shows that prefilling tax returns is an effective solution for lowering high tax compliance costs, the VAT tax gap, and the risk of burdensome tax audits.

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Annex A: Summary of the Literature

The adoption of electronic tax administration practices, such as e-registration, e-filing, and e-invoicing, is becoming increasingly common in many countries. However, there has been surprisingly little research on the effects of digitalization on tax administration. Recent literature, including studies by Pavlova and Smolina (2020), Perekrestova and Nadtochiy (2019), and Seely (2022), demonstrates a growing interest in investigating the impact of digitalization on tax and customs control and its effects on the transparency of tax operations.

One area of focus is prefilled tax returns, which are seen as crucial in the rapid global expansion of value chains. Studies by Barbone, Byrd, and Vazquez-Caro (2012); Symons, Howlett, and Alcantara (2010); and Klun (2009) show that prefilled returns can decrease compliance expenses and streamline the compliance process, particularly for small enterprises and self-employed taxpayers. The use of prefilling systems based on computers has become increasingly widespread, as shown by studies by Deloitte (2017); Dziemianowicz (2017); Harju, Matikka, and Rauhanen (2019); and Poniatowski, Bonch-Osmolovskiy, and Smietanka (2021).

Prefilling systems can also help enforce policy adherence and prevent associated fines for negligence and failure to comply with tax responsibilities. Gale and Holtzblatt (2003) highlight the importance of prefilling in reducing tax evasion in the U.S. tax system. The restructuring of complex taxation administration systems that were previously based on paper can have significant advantages in keeping track of the tax process and updating compliance information.

Utilizing technologically advanced prefilling systems can significantly lower the costs associated with tax compliance and minimize corruption loopholes and mistakes when handling paperwork. Studies by Coolidge and Yilmaz (2014), Sampson (2007), and Evans and Tran-Nam (2014) all demonstrate the significance of electronically enabled prefilling of tax forms. Overall, the incorporation of ICT tools, such as prefilling, can increase the effectiveness of tax administration and lower the related costs of tax compliance and administration, according to Kitsios, Jalles, and Verdier (2020), Contos et al. (2010), OECD (2008), and Walpole (2014). However, more empirical data on cost reductions from e-government, prefilled tax forms, and e-filing are needed to fully understand the potential benefits of digitalization in tax administration.

All in all, the use of prefilled VAT returns continues to attract the attention of TAs. Prefilled VAT returns are the natural development of a mandated e-invoicing system or a real-time invoice data reporting system for TAs because the data are already available. Consequently, taxpayers must have complete electronic records that can be reconciled with prefilled VAT returns. This will assist taxpayers in correcting any inaccuracies or challenging VAT assessments as needed.

While prefilling is intended to help taxpayers file legally valid tax returns (OECD, 2017), inaccurate or misleading numbers in a prefilled tax form may result in additional tax evasion. Regarding income tax forms, using prefilled tax returns minimizes taxpayer compliance expenses (Goolsbee, 2006; Klun, 2009; Evans and Tran-Nam, 2010). Nevertheless, there is little evidence that prefilled tax returns influence taxpayer compliance, especially inadequately prefilled ones. Slemrod (2016), for instance, notes that the direct effect of prefilling on compliance is unclear. Preliminary empirical evidence suggests that prefilling can affect compliance, according to Kleven et al. (2011). They report that income subject to third-party reporting (prefilled forms) has a more significant tax compliance rate than self-reported income (no prefilling). On the other hand, partial prefilled tax forms had no or only a modest negative effect on reported taxable income (Kotakorpi and Laamanen, 2016; Gillitzer and Skov, 2018).

Author(s)	Key findings
OECD (2006)	• Countries in the Nordic region have made considerable progress in establishing comprehensive and efficient systems of prefilled returns and appear to derive many benefits from their operation. • These benefits include reductions in taxpayers' compliance burden, improved compliance in liability reporting, reductions in administration costs from the more efficient processing of taxpayers' data, reduced volumes of taxpayers' unintended errors, and a significantly scaled-down back-end verification program.
Klun (2009)	• Simplifying the administrative procedure for taxpayers completing income tax return forms would result in a 73 percent reduction in taxpayer compliance costs. • The abolition of tax allowances and the use of totally prefilled tax returns led to additional reductions in taxpayer costs.
Bird & Oldman (2000)	• Integrating IT expertise (online prefilled returns) reduces the tax administration and compliance costs by facilitating compliance among taxpayers, pointing out the tax liabilities, and efficient collection of taxes. • The evaluation of technology focuses on online prefilling processes without consideration of cash income and payments, which are significant in the taxation process.

	• Under the "no touch" system in Denmark, which provides extensively prefilled returns online, over 90 percent of taxpayers no longer need to file returns or have direct contact with the administration. Thus, compliance costs are reduced, and substantial administrative resources are freed up to deal with more complex administrative problems such as auditing complex or questionable returns.
Duran-Cabre (2011)*	• The evaluation of the Spanish experience of the prefilled income tax return is excellent. The TSM may be thought of as a two-stage procedure: first, taxpayers will receive tax information by mail, and second, prefilled tax forms will be made available, or only tax information if these are not feasible. • Its effectiveness is shown by the rising number of taxpayers who seek the services, the number of confirmations of the prefilled return, and the survey findings. • One significant concern is the use of third-party information reports by the new services, even though the TA previously had access to this data. • The prefilled tax return method thus does not indicate rising compliance expenses for these third parties (e.g., employers). • In other instances, the data was previously accessible to other government agencies and is now also accessible to the TA. • The new service strongly illustrates how third-party data may be beneficial for preventing tax fraud and streamlining tax compliance. The TA should always strive to improve and evaluate its services.
Erard (2011)	• The analysis of prefilled tax returns in the California pilot program (ReadyReturns) does not reveal a significant shift in tax compliance behavior. Rather, the benefits are more likely to be a lighter tax burden for taxpayers with specific circumstances and some enhancements to processing speed. • For the first few years of implementation, it is realistic to anticipate non-trivial net administrative costs associated with prefilled tax returns; nevertheless, these costs are expected to be more than compensated by the advantages to participants in the form of a lighter compliance burden. • The total compliance burden may be anticipated to reduce by a maximum of 5.3 percent (US$4.4 billion divided by US$83 billion), even with 100 percent participation in a planned prefilled return program that would be expanded to 40 percent of the general filing population. Therefore, it is obvious that a prefilled return program is not a magic fix for the very complicated and onerous income tax system. However, it does have the potential to significantly reduce the burden on many taxpayers, many of whom have low to moderate income levels, at a relatively minimal administrative cost. • The administration expenses of the ReadyReturns pilot came to US$222,000 in the first year and US$161,000 in the second. It is expected that net expenses will continue to drop as more people utilize ReadyReturns and the percentage of electronic filing rises. Administrative savings from improved electronic filing, decreased manual processing, and correction of returns are among the anticipated advantages.

Evans and Tran-Nam (2011)	• In the absence of systematic analyses of the costs and savings for TAs introducing prefilled returns, such programs are typically said to lower expenses. However, no empirical data support or challenge such a claim. • Prefilling might minimize administrative expenses by reducing data matching, auditing, and tax-dispute settlement. Prefilling e-tax and the Tax Agent Portal demands extra resources. Thus, TA cost savings may not be as significant as promised. More research is needed to establish whether prefilling reduces administrative expenditures. • Reduced agent costs may balance any increase in self-preparers' return-filing time. Some data suggest tax agents' importance is waning. • Younger taxpayers and those with straightforward tax affairs are more inclined to prefill. This tendency may not continue until prefilling data improves timeliness, comprehensiveness, availability, and correctness. • Self-preparers who file online would benefit more from prefilling than agents.
Vaillancourt, Clemens, Palacios (2008)	• In a subnational jurisdiction, it seems feasible to utilize prefilled personal income tax forms. It is unknown whether the reduced compliance costs would outweigh the higher administrative expenses and possibly less personal interest in tax issues connected with prefilled filings. • Making tax information available to a revenue authority in electronic form for download so that tax filers can utilize it in their tax preparation software is one option that has not been fully considered. In exchange for retaining the need for people to determine their tax responsibilities and take an interest in their tax affairs, this would lower compliance expenses. It is possible to think of this as a decentralized kind of prefilled tax return.
Verdonck (2011)	According to this survey, the main reasons suggested by accountants to explain why they do not use the electronic prefilled tax returns are: • Insufficient knowledge of the advantages of online filing (53.1 percent). • Distrust in the confidentiality of the data on the Internet (35.6 percent). • Unclear identification procedure (33.8 percent). • Too little communication to encourage online filing (27.8 percent).
Kotakorpi and Laamanen (2016)	• Prefilled returns reduce administrative costs for the tax authority and compliance costs for taxpayers. However, their effects on reporting behavior have been unexplored to date. • Receiving a partially prefilled income tax return increased taxpayers' tendency to report deduction items on the tax return. It reduced the tendency to report income and deduction items that are not prefilled.
Fonseca and Grimshaw (2017)	• Prefilling tax returns only makes sense as a strategy when done with very reliable data. • Setting default values too low reduces taxpayers' actual tax liabilities, which substantially negatively impacts compliance and tax collection.

van Dijk, Goslinga, Terwel, and van Dijk (2020)	• Returns that were appropriately prefilled had the greatest rate of compliance, followed by returns that were not prefilled, returns those overstated liabilities, and returns with the lowest compliance. • Only returns that overestimated liabilities saw an improvement in compliance with accuracy confirmation. • Morals and defaults are crucial in determining how prefilled returns affect compliance. • Prefilling tax returns should be done with caution since, when done well, it may boost tax compliance, but it can decrease it when done incorrectly. • Taxpayers may become more aware of errors in prefilled forms if they must validate the correctness of stated obligations. However, this awareness only prompts people to act when fixing errors results in financial gains. Therefore, this kind of action could be more successful in curbing tax evasion than for (more) deliberate payments of taxes.
Doxey, Lawson, and Stinson (2021)	• Consistent with omission theory, prefilled returns lower compliance compared to self-completed returns when the prefilled returns do not estimate undocumented sources of income (e.g., cash tips). • Including estimates of undocumented income increases taxpayer compliance relative to self-completed returns. • Prefilled returns eliminate the often-replicated differences in reporting behavior between taxpayers in refund versus tax due settlement positions, suggesting that prefilled returns changed individuals' reference points. • Implementing a prefilled return policy could economically affect taxpayer decisions. • Prefilled returns lower compliance when the prefilled returns barely approximate undocumented income sources such as cash tips.
Fochmann et al. (2021)	• Prefilled deductions enhance tax compliance. • When returns are prefilled, item-specific tax evasion level decreases—especially for items preferred for tax evasion—and consequently, the overall tax evasion level is reduced. • The positive effect of prefilling might be primarily driven by higher non-monetary costs associated with tax evasion under this mechanism. This finding highlights the importance of non-monetary and psychological factors in the design of tax regulations.
Fochmann, Müller, and Overesch (2021)	• Correct prefilling enhances compliance. However, in cases of incorrect prefilling, there are asymmetric effects. • If prefilled income is lower than real income, there would be no positive compliance effect, and compliance is on the same level as with blank forms. • If prefilled income is higher than true income, prefilling still positively affects compliance. In that case, compliance is on the same level as correctly prefilled forms and higher than with blank forms. • Receiving a prefilled tax return does not affect individuals' total taxable income and taxes paid. These results are significant for an overall evaluation of the TSM. • To the extent that taxable income is a sufficient statistic for welfare, the results coupled with the savings in administrative costs associated with prefilled tax returns point toward the conclusion that prefilled tax returns are a good idea.

Warren (2016)	• There are distinct changes in the behavior of self-preparers on work-related expense deduction claims relative to those using a tax agent. • E-tax self-preparers have a significantly increased incidence of claims, even though the average level of relative claim has declined. • In an environment with incentives for electronic lodgment and limited prefilling of deductions, it is concluded that this differential behavior warrants further study from a compliance risk perspective and the appropriateness of the current policy treatment of deductions.
Goodman et al. (2022)	• Each year Americans spend over two billion hours and US$30 billion preparing individual tax returns, and these filing costs are regressive. • Between 62 and 73 million returns (41 to 48 percent of all returns) could be accurately prefilled using only current and prior-year information returns. • Accuracy rates decline with income and are higher for taxpayers who have fewer dependents or are unmarried.

Note: *Evans and Tran-Nam (2011), Verdonck (2011), Erard (2011), and Duran-Cabre (2011) are all chapters in Vaillancourt et al. (2011).

Annex B: Model Parameters of Chile

Timing Parameters for Analysis	
Investment period	1 year
First year of operations	2
Last year of operations	11
Operations duration	10 years
Liquidation year	12
Number of taxpayers [a]	
Large taxpayers	14,749
Medium taxpayers	29,256
Small taxpayers	206,313
Micro taxpayers	769,797
Compliance cost [b]	
Large taxpayers	US$4,207
Medium taxpayers	US$2,285
Small taxpayers	US$1,164
Micro taxpayers	US$645
Annual growth rate in number of firms [c]	
Large taxpayers	2%
Medium taxpayers	2%
Small taxpayers	2%
Micro taxpayers	2%
Value of labor time [d]	

SII employees	CLP 11,292/hour
Large businesses	CPL 6,775/hour
Medium businesses	CPL 6,775/hour
Small businesses	CPL 5,081/hour
Micro businesses	CPL 5,081/hour
Growth rates in real wages [e]	
SII	2%
Taxpayers	2%
Growth rates in real operating cost [e]	
SII	2%
Taxpayers	2%
Discount rate [f]	6%
Costs	
Operating costs for TA [g]	
Computer upgrade cost	US$5 million
Software licensing and maintenance cost	US$1 million
Number of workers [h]	20
Working hours (annual)	2,000
Investment costs for TA	
Personnel cost	
Working hours (annual)	2,000
Number of workers	10
Training costs	
Number of training hours	120
Number of trainees	50
Large taxpayers	
Cost of computer system changes per firm	-
Training time per firm (hours)	200
% of large taxpayers affected	100
Medium taxpayers	
Cost of computer system changes per firm	-
Training time per firm (hours)	80
% of medium taxpayers affected	100
Small taxpayers	
Cost of computer system changes per firm	-
Training time per firm (hours)	40
% of small taxpayers affected	100

Micro taxpayers	
Cost of computer software changes per firm	-
Training time per firm (hours)	40
% of micro taxpayers affected	100
Benefits	
TA	
Time savings to TA (hours)	40,000
Large taxpayers	
Compliance cost reduction [i]	76%
Refund time reduction [j]	10% (30 days)
Average refund amount	US$100,000/year
Medium taxpayers	
Compliance cost reduction	76%
Refund time reduction	10% (30 days)
Average refund amount	US$30,000/year
Small taxpayers	
Compliance cost reduction	76%
Refund time reduction	10% (30 days)
Average refund amount	US$20,000/year
Micro taxpayers	
Compliance cost reduction	76%
Refund time reduction	10% (30 days)
Average refund amount	US$10,000/year
VAT gap	
Net VAT revenue k	US$15,963 million
Annual percentage change in net VAT revenue [l]	2%
Increase in VAT revenue due to improved compliance	2%
CIT [m]	
Large businesses	27%
Medium businesses	25%
Small businesses	25%
Micro businesses	25%

Sources for parameter values:

[a] OECD- Library.org " internal tax service 2019". https://www.oecd-ilibrary.org/sites/2d41390a-en/index.html?itemId=/content/component/2d41390a-en

[b] Considering factors such as VAT gap, population, and GDP per capita, this study adopted the per-taxpayer compliance cost from Romania as a basis for estimating the compliance cost for similar taxpayer types in Chile before the implementation of prefilled tax returns. Detailed explanations are provided in

the text. For more information regarding the compliance cost in Romania please refer to: EU KPMG Compliance Costs of SME 2018 (European Commission, 2018).
[c] The compound growth rate of the number of the taxpayers in Chile from 2015 to 2019 was 2 percent. Refer to OECD (2015; 2019).
[e] Growth rates in real wages are assumed to be 2 percent for both the Chilean tax authorities (Servicio de Impuestos Internos) and taxpayers.
[f] J. Campos, T. Serebrisky and A. Suárez-Alemán, Tasa de descuento social y evaluación de proyectos: algunas reflexiones prácticas para América Latina y el Caribe, Inter-American Development Bank (IDB), 2016. Chile: National Investment System of the Ministry of Social Development.
[g] For this case study it was not possible to isolate the specific IT system costs for the prefilling of VAT returns. The total IT cost, including both capital investments and operating costs, is known historically for the Chilean TA. In the decade from 2009 to 2019, it amounted to an average of US$11.9 million annually, broken down into OPEX (operating expenditure), 60 percent, and investments in hardware, 40 percent (IDB, 2021). Due to the nature of this function, it is expected that the TA will primarily use third-party operators of cloud computing services. These costs would be classified primarily as OPEX. As an overstatement of costs associated with the prefilling of VAT returns, the annual additional operating cost of the IT systems for prefilling VAT returns by the TA is assumed to be US$6 million, including US$5 million for computer services and US$1 million for software licensing and maintenance costs.
[h] We would expect that there would be substantial savings in personnel costs as the system for prefilled returns matured. At the moment, we do not have a good estimate of how this process has and will take place in Chile. However, to make our guidelines complete, we have added 20 people to operate this system, and at the same time it is assumed that 20 people will be made redundant. In order not to overestimate the benefits of this innovation, we assumed that the total number of people employed by the TA would remain constant, but the mix of skills would change. By specifically identifying that there will be increases in some types of personnel and at the same time reductions in other types of personnel, we are making our guidelines complete. Users of these guidelines can insert the values for these impacts that more accurately describe the situation of their specific country.
[i] According to the European Commission's (2018) report on tax compliance costs for SMEs, data collection is the most important driver of costs when it comes to VAT compliance. Related costs comprise about 30 percent of tax compliance costs for VAT, preparation costs about 29 percent, review costs about 24 percent, and submission costs the smallest proportion, 17 percent. After the TSM, by eliminating data collection, preparation, and submission costs, only 24 percent of the compliance costs remain for reviewing the prefilled VAT returns. For more information, please refer to Eliminating all the costs except reviewing. EU KPMG Compliance Costs of SME 2018, Table 69.
[j] The reduction in refund processing time is assumed to be 30 days per year for all categories of taxpayers, and 10 percent of taxpayers would be affected by the reduction, regardless of the category.
[k] Tax Revenues Chile - OECD.Stat – 2020
[l] Tax Revenues Chile - OECD.Stat - Average Growth from 2002–2019
[m] The basic tax on income is the First Category Tax (FCT), which is levied on the entity's worldwide income. The FCT rate is 25 percent for SMEs and 27 percent for entities subject to the partially integrated system (PIS). The PIS is a system of taxation that allows entities to credit a portion of the corporate tax paid by the company against the final tax paid by the individual shareholders. The PIS system is available for certain entities, such as corporations and limited liability companies. However, not all entities choose to use the PIS system, as it is optional and subject to certain requirements and conditions. For more information, see: https://taxsummaries.pwc.com/chile/corporate/taxes-on-corporate-income.