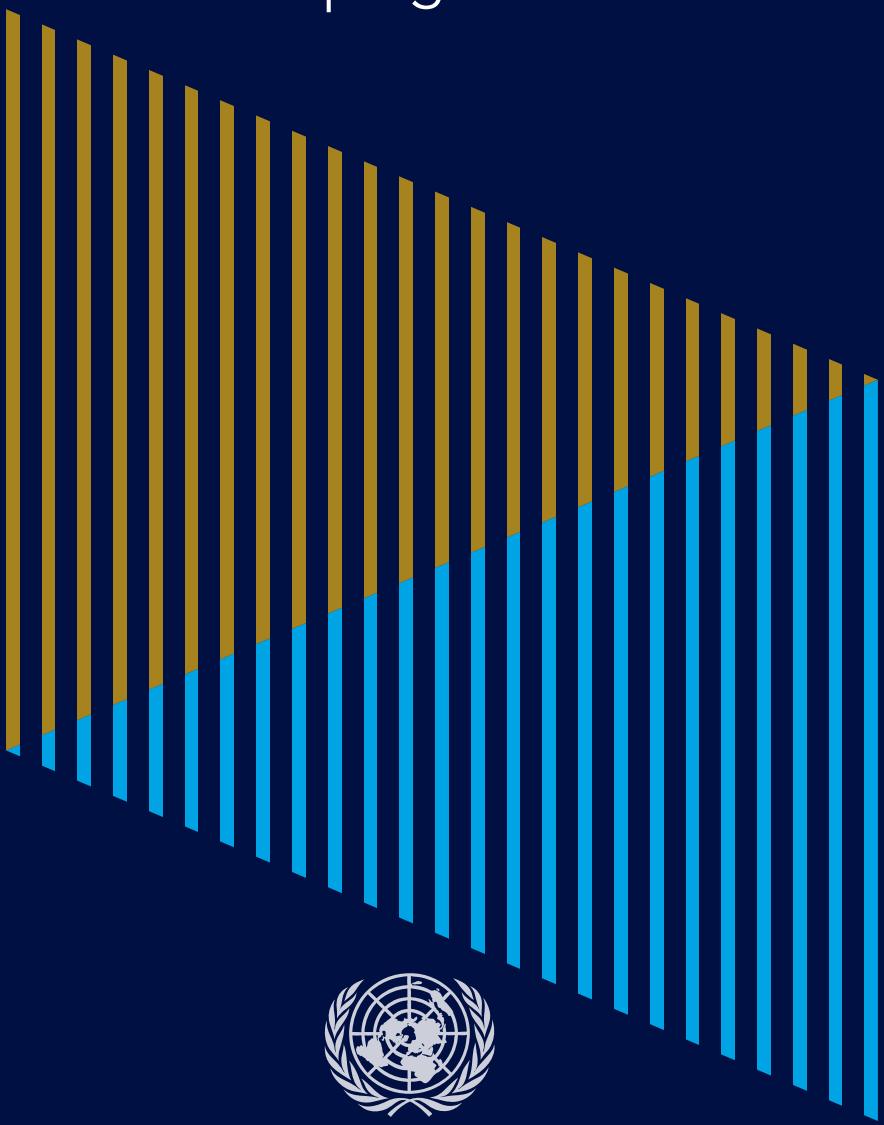
United Nations Guidance Paper Series on Value Added Taxes/ Goods and Services Taxes for Developing Countries



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Background and Acknowledgements

About the Committee

The United Nations Committee of Experts on International Cooperation in Tax Matters (the "Committee") comprises twenty-five members appointed by the Secretary-General, after notifying the Economic and Social Council, to serve in their personal capacity for a four-year term. Selected for their expertise in tax policy and administration, the members reflect diverse geographical regions and tax systems. The Committee is globally recognized for its normative and policy-shaping work and for the practical guidance it provides in tax policy and administration.

Committee mission

The Committee develops tools and resources for governments, tax administrators and taxpayers to help strengthen tax systems and mobilize financing for sustainable development, as well as strengthen international tax cooperation. The work aims to prevent double taxation and non-taxation while helping countries broaden their tax base, strengthen administration and combat tax evasion and avoidance. The Committee places special emphasis on addressing the needs of least developed countries, small island developing States and landlocked developing countries.

Committee working methods

The Committee meets twice annually—in spring (New York) and fall (Geneva). Between these sessions, Subcommittees work on specific topics under the Committee's oversight. These Subcommittees, whose participants also serve in their personal capacity, prepare proposals and draft guidance for the review and approval by the Committee. This collaborative approach ensures thorough, multi-disciplinary and multi-stakeholder examination of complex tax issues, while maintaining the Committee's ultimate responsibility for all published guidance.

The value added tax/goods and services tax initiative and the Sustainable Development Goals

At its Twenty-third Session in 2021, the Committee's 2021-2025 membership decided to establish, for the first time, a Subcommittee on Indirect Tax Issues, with a mandate to identify priority value added tax (VAT)/goods and services tax (GST) concerns and develop draft guidance that could best support developing countries in diverse contexts. This initiative aimed to develop a practical series on effective VAT/GST systems, recognized as an important tax base for developing countries seeking to strengthen domestic resource mobilization and to achieve the Sustainable Development Goals (SDGs). By improving the design and administration of VAT/GST taxes, countries can generate

the revenue streams needed to fund essential public services, infrastructure and social protection programmes that directly advance multiple SDGs. The Subcommittee comprises a number of Committee members and other participants from tax administrations, policymakers with wide and varied experiences related to indirect taxes, as well as people from academia, international and regional organizations and the private sector.

This publication

This publication includes four guidance papers, reviewed, refined and approved by the Committee during its Twenty-ninth Session in October 2024. It provides countries with essential tools for building robust, equitable tax systems that can reliably finance sustainable development priorities.

The four guidance papers covers: (a) an overview of VAT/GST in developing countries; (b) VAT/GST treatment of small enterprises; (c) VAT/GST refunds; and (d) the use of new technologies to improve compliance, including e-invoicing and big data.

The first paper introduces the series by examining the role of consumption taxes, the functioning of VAT/GST, key design elements, potential regressivity concerns, and challenges in compliance and administration. It provides a broad analytical foundation for policymakers.

The second paper explores threshold policies, including exemption and voluntary registration, sector-specific thresholds, and the design of multiple thresholds to support gradual inclusion. It further analyses evasion risks and policy options that can improve compliance, reduce costs, and simplify the regime for small businesses.

The third paper addresses the rationale, mechanisms, and challenges of refund systems, drawing on perspectives from both tax administrations and taxpayers. It highlights administrative considerations and safeguards necessary to ensure timely and transparent refunds.

The fourth paper reviews options for enhancing VAT data management and tracking, with emphasis on country-specific approaches. It encourages administrations to evaluate and adapt technologies such as e-invoicing, big data analytics, and electronic reporting systems according to their capacity and needs.

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Paper I. An overview of value added tax/goods and services tax in developing countries

1. Introduction

Developing countries have multiple tax instruments, each with different strengths. The strength of the income tax is to increase progressivity in the tax system. Excise taxes can effectively incorporate social costs not reflected in market prices into the private costs borne by consumers and producers. Customs and import duties can protect infant industries and encourage import substitution. The strength of the value added tax (hereinafter referred to as VAT), otherwise referred to as the goods and services tax (GST), is its capacity to raise substantial tax revenues at low economic costs.[1]

This strength of the VAT makes it one of the most important tax instruments for developing countries. Developing countries require additional tax revenues and often struggle to collect sufficient revenues from direct taxes. The VAT, therefore, plays a critical role towards domestic revenue mobilization and is the major revenue instrument in many developing countries. In Africa, for instance, the largest share of tax revenues is derived from the VAT.

Because of the important role of the VAT in developing countries, it is essential to understand this tax. It is also important to design and administer it to be revenue-productive and provide favorable economic outcomes for developing countries. To assist towards these aims, a series of papers were developed to address key issues for developing countries (see section 6).

Certain issues are not discussed in detail in this series of papers. One such issue for developing countries is the application of VAT on cross-border supplies, also referred to as inter-jurisdictional issues (see section 3.6).[2] Issues not covered in detail in this series of papers may be addressed in the future.

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1 The revenue-raising capabilities of the value added tax (VAT) may partly explain the exceptional rate at which the tax has been adopted. Over 170 countries have already implemented a VAT, with over 50 countries adopting it over the past 20 years. About 90 per cent of countries with full UN membership apply a VAT. The only major economy without a VAT is the United States.

2 Extensive work has been done on inter-jurisdictional issues. Readers who are interested in this topic are referred to the publications of the Organisation for Economic Co-operation and Development (OECD), especially the *International VAT/GST Guidelines* and *Addressing the Tax Challenges of the Digital Economy: Action 1—2015 Final Report* (Paris, 2015). These publications are complemented with detailed technical

This paper provides an overview of the VAT, which forms the foundation of the subsequent papers in this series. It provides insights into the workings of VAT and other consumption taxes, the basic design elements of the VAT, the potential regressivity of VAT, and compliance and administration issues.

2. Understanding the value added tax and other consumption taxes

2.1. Introduction

A general understanding of the VAT and other broad-based consumption taxes, specifically the retail sales tax (hereinafter referred to as RST), is required to appreciate the implications of policy design. Working towards such an understanding, this section discusses the general features of a VAT and provides examples of how it works under alternative policy options and compares this to an RST. It also discusses the implications of exempt supplies, zero-rated supplies, rate changes and whether the VAT can be preferred to an RST in the context of a developing country.

2.2. General features of a value added tax

A revenue-productive and economically efficient VAT tends to be a tax that includes the supply of most goods and services in the economy within its base, ensuring it captures a large portion of the economy's consumption activities. The fewer the exemptions and zero-rated goods, the broader the base, which enhances the efficiency and productivity of the tax in terms of revenue generation.

However, it is important to note that the broad-based nature of this tax primarily aims to capture final consumption by households. Indeed, VAT is designed so that only the final consumers bear the burden of the tax, aiming to tax consumption expenditure by private households. For this reason, VAT is considered neutral for businesses, which is one of the key features of this tax. A neutral tax implies that it does not influence business decisions or economic activities disproportionately.

This neutrality is achieved by allowing VAT-registered businesses to deduct the VAT they paid on their purchases ("input VAT") against the VAT they charge on their supplies ("output VAT").[3] This is known as the credit mechanism and is primarily

guidance to support their coherent implementation and application. These include a report on *Mechanisms for the Effective Collection of VAT/GST where the Supplier is not Located in the Jurisdiction of Taxation* (Paris, 2017), a report on *The Role of Digital Platforms in the Collection of VAT/GST on Online Sales* (Paris, 2019), a report on *The Impact of the Growth of the Sharing and Gig Economy on VAT/GST Policy and Administration* (Paris, 2021) and a set of toolkits aimed at supporting their actual implementation in different regions of the world namely, the *VAT Digital Toolkit for Latin America and the Caribbean* (Paris, 2021), *VAT Digital Toolkit for Asia-Pacific* (Paris, 2022) and *VAT Digital Toolkit for Africa* (Paris, 2023).

3 The VAT deduction is generally limited to the extent that the purchased goods or services will be used to make taxable supplies.

implemented through the invoice credit method. This method requires businesses to keep detailed records of VAT paid and collected through their invoices, facilitating accurate deductions and ensuring transparency in tax reporting. The system thus ensures that businesses remit only the net VAT to the revenue administration, which is the difference between their output and input VAT. Where input VAT exceeds output VAT in a tax period, the system, in principle, is designed to provide a prompt VAT refund to the business, thereby preserving its neutrality.

The credit mechanism also reveals another distinctive aspect of VAT: its indirect collection in stages at each level of the production process or supply chain. Each business in the supply chain collects VAT on their sales and remits only the amount corresponding to the value they add to the products or services. This ensures that the tax is effectively applied at each transaction point, being indirectly collected by vendors, while ultimately shifting the burden to the end consumers, minimizing the direct tax burden on businesses and aligning with the goal of taxing final consumption.

In practice, however, the implementation of VAT often diverges from its theoretical framework. The VAT can be described as a fully broad-based tax on consumption only in a few countries. Many jurisdictions exempt or zero-rate an extensive list of goods and services, which generally decreases tax revenues, narrows the tax base and, in the case of exemptions, results in the taxation of business production activities. Moreover, while the credit mechanism is theoretically designed to ensure that excess input VAT is promptly refunded to businesses, this is not often observed in practice. In many jurisdictions, particularly in developing countries, such refunds are delayed or replaced entirely by a carry forward of credits to future tax periods. These deviations can result in cash-flow issues, losses related to the time value of money, and sometimes exchange rate implications for businesses.

The following section discusses the implications of VATs in greater detail as they are applied in practice.

2.3. The workings of a value added tax

2.3.1. Standard-rated value added tax and retail sales tax

The basic workings of a VAT can be illustrated through an example of the supply of a single good through the production-distribution chain, that is, from the initial producer to the final consumer.

Consider that a producer has costs of zero (that is, the producer incurs no input costs) and sells a good to a manufacturer for 4,000 (this is the amount before adding VAT). The manufacturer then sells this product for 10,000 to a retailer. The retailer then sells the good to the final consumer for 20,000. Each business in the chain adds value to the good before passing it on to the following actor, and this increase is reflected in the sales price at every stage. All these amounts are VAT-exclusive, meaning the prices do not include any VAT yet.

Table 1 shows the VAT-exclusive purchase and sales prices at each stage of the production-distribution chain for this example:

Table 1: VAT-exclusive sales prices

Production-distribution chain	Purchases (excl. VAT)	Value added	Sales (excl. VAT)
Producer	0	4 000	4 000
Manufacturer	4 000	6 000	10 000
Retailer	10 000	10 000	20 000
Consumer	20 000	-	-

Assuming a standard rate of VAT of 10 per cent and that all supplies are subject to VAT, the impact of VAT at each stage of the supply chain is calculated as the difference between output VAT (VAT charged on sales) and input VAT (VAT paid on purchases). This difference represents the amount declared (or payable) to the revenue administration and corresponds to the value added by each business, that is, the increase in value from its purchases to its sales. As a result, VAT is effectively levied on the value added at every stage of the production-distribution chain.

Since the producer has no input VAT to claim (as there are no prior purchases), it charges 10 per cent VAT on its sale of 4,000, which amounts to 400. This full amount is declared to the tax administration[4] and reflects the VAT on the value added by the producer. The manufacturer charges 10 per cent VAT on its sale to the retailer (which is 1,000, that is, 10 per cent of 10,000) and deducts 400 as input VAT paid on its purchase from the producer. Therefore, it declares and remits a net VAT of 600, corresponding to the VAT on its value added of 6,000. The retailer collects 2,000 in output VAT (10 per cent of 20,000) from the final consumer, deducts 1,000 as input VAT paid on its purchase from the manufacturer, and declares 1,000 as the payable VAT, again reflecting the VAT on its value added of 10,000. The final consumer is not involved in the VAT declaration process but ultimately bears the entire VAT burden, paying a total of 2,000 in VAT embedded in the final price of 22,000.

Table 2 summarizes the VAT breakdown across the supply chain:

Table 2: VAT breakdown

Production-distribution chain	Input VAT	Output VAT	VAT declared
Producer	(0)	400	400
Manufacturer	(400)	1 000	600
Retailer	(1 000)	2 000	1 000
Consumer	2 000	-	-

4 The term "tax administration" refers to the institution authorized to manage VAT. In this paper, as well as subsequent papers, the term may also be used interchangeably with "tax authority" or "revenue authority" as well as "revenue administration".

Based on these VAT consequences, it is possible to calculate the actual amounts paid by each entity when VAT is included. Table 3 illustrates the VAT-inclusive purchase and sales prices, showing the actual monetary amounts exchanged between each actor in the supply chain once VAT is applied:

Table 3: VAT-inclusive purchase and sales prices

Production-distribution chain	**Purchases** (incl. VAT)	**Sales** (incl. VAT)
Producer	0	4 400
Manufacturer	4 400	11 000
Retailer	11 000	22 000
Consumer	22 000	-

Table 4 provides a consolidated summary of the VAT treatment across the entire supply chain, bringing together the key elements discussed above, thereby illustrating how the VAT system operates in practice:

Table 4: VAT treatment across the supply chain

Production-distribution chain	**Purchases** (excl. VAT)	**Value Added**	**Sales price** (excl. VAT)	**Output VAT**	**Input VAT**	**VAT Remitted**	**Final Price**
Producer	0	4 000	4 000	400	0	400	4 400
Manufacturer	4 000	6 000	10 000	1 000	400	600	11 000
Retailer	10 000	10 000	20 000	2 000	1 000	1 000	22 000
Consumer	20 000	-		-	-	-	22 000

There are a few important observations from this example:

First, VAT is collected progressively along the supply chain, from the producer to the manufacturer to the retailer, but none of these businesses ultimately bear the VAT cost. Although the producer declares and pays VAT to the tax administration, its net VAT burden is still zero because the VAT collected from the manufacturer is simply passed on to the tax administration, not being an additional cost. Similarly, the VAT paid by the manufacturer to the producer is recovered when the manufacturer charges VAT on its sale to the retailer, meaning that the net VAT burden on the manufacturer is also zero. The same process holds throughout the production-distribution chain, except for the final consumer. The consumer pays VAT of 2,000 to the retailer, but cannot deduct this VAT since they will not use the good to make further supplies charged with VAT. Thus, the VAT burden lies solely on the consumer.

Second, although VAT only burdens the consumer, it is collected at every stage of the production-distribution chain. It is collected from the producer, manufacturer and retailer in proportion to the value added by each of these suppliers. Even if a supplier was not VAT-registered, VAT would still have been collected on the supply of the good on the value added up to the point of final sale.

Third, the total amount of VAT collected throughout the production-distribution chain, which amounts to 2,000, is equal to the VAT paid by the consumer to the retailer. The consumer will face a tax inclusive price of 22,000, of which 2,000 is VAT. This is the same amount of VAT that is collected throughout the production-distribution chain. Therefore, the VAT is a tax on consumers, collected throughout the production-distribution chain.

This basic working of the VAT can be contrasted with an RST. The RST does not rely on input tax deductions by producers, but exemption certificates. Assuming the same tax rate under the VAT, the RST consequences will be:

Table 5: The effect of RST across the supply chain

Production-distribution chain	Input tax	RST	RST declared
Producer	Exempt	Exempt	-
Manufacturer	Exempt	Exempt	-
Retailer	Exempt	2 000	2 000
Consumer	2 000	-	-

The same amount of tax (2,000) is collected under the RST and the VAT. The consumer faces the same tax burden under both taxes. The tax burden on those who are not final consumers is zero for both the RST and the VAT. However, the point at which the tax is collected is different. The RST is fully collected at the retail stage, while the VAT is collected throughout the production-distribution chain. The consequences of these different collection mechanisms are further discussed in section 2.4.

2.3.2. Exempt supplies under the value added tax

The example in the previous section can be further adapted to illustrate the consequences of exempting a supply within the production-distribution chain. Under a VAT system, an exempt supply means that no VAT is charged on the transaction, and no input VAT deduction is allowed. This affects the neutrality of the system and can lead to cascading effects. The consequences will differ depending on whether an intermediate or a final supply of good or service is exempt.

Consider the case where the supply by the manufacturer to the retailer is exempt from VAT, but the final supply from the retailer to the consumer remains subject to VAT. In this scenario, the manufacturer cannot deduct input VAT for the 400 it paid to the producer. This non-deductible tax becomes a cost that the manufacturer will try to shift forward in the form of a higher sale price to the retailer.

As a result, the VAT burden is no longer restricted to the final consumer, as part of the tax which was originally intended to be deductible is now embedded in the price of the intermediate good and may be passed on to the retailer. If unable to do so, a portion of the non-deductible input VAT will be absorbed by the manufacturer, reflected in production costs, or a reduction in the profit margin. Consequently, the final sales price is higher than if all supplies were subjected to the VAT at 10 percent, raising the tax burden on the consumer.

The following table summarizes the impact of the exemption on the VAT treatment and the prices along the supply chain:

Table 6: Summary of VAT exemption

Production-distribution chain	Purchase price	Input VAT	Value Added	Sales (excl VAT)	Output VAT	Sales Price	VAT declared
Producer	0	0	4 000	4 000	400	4 400 (inc. VAT)	400
Manufacturer	4 400 (incl. VAT)	400 (non deduct.)	6 000	10 400 (includes 400 embedded input VAT)	Exempt	10 400 (VAT exempt)	0
Retailer	10 400	Exempt	10 000	20 400	2 040	22 440 (inc. VAT)	2 040
Consumer	**22 440 (incl. VAT)**	2 440	-	-	-	-	-
TOTAL	-	-	-	-	-	-	2 440

The VAT-inclusive sales price from the producer to the manufacturer remains the same, at 4,400. However, the manufacturer's sales price now reflects the amount of the non-deductible input VAT of 400, which the manufacturer shifts forward in the production-distribution chain. The retailer then charges VAT on a higher base, resulting in a final price of 22,440 instead of 22,000, and a higher total VAT paid by the consumer of 2,440 instead of 2,000. As a result, the final sales price is higher than if all supplies were subjected to the VAT at 10 percent, raising the tax burden on the consumer.

If the full amount is not shifted forward, the manufacturer absorbs the difference as a reduction in profits or productivity. In either case, the final consumer pays more than in the standard scenario, either through a higher price or indirectly via reduced supply-side efficiency.

This example illustrates the negative consequences of exemptions on intermediate goods and services. First, exemptions result in a tax on production. To avoid this additional cost, the retailer may purchase from a different manufacturer (in case the

exemption lies on the manufacturer, which is not common in VAT systems), use a different input that is not exempt (which is more common, as exemption usually applies to a certain type of good or service), or integrate with the manufacturer to eliminate the exempt supply, known as vertical integration. These changes are not driven by efficiency or productivity, but by tax considerations, reducing economic efficiency. Additionally, the consumer's decision is also distorted since the price has increased.

Second, exemptions may require the manufacturer to claim input VAT apportionment. If the manufacturer also makes taxable supplies, they will only be able to deduct input VAT proportionally to their taxable supplies. This allocation process increases administrative and compliance costs, and presents an opportunity for potential abuse, such as falsely increasing the input VAT apportionment ratio to claim higher deductions.

Third, VAT becomes more complex to comply with and administer. Since certain supplies are subject to the standard rate and others are exempt, registered persons need to apply the correct VAT treatment to goods and services. Many countries do not sufficiently define exempt goods and services, increasing legal uncertainty. Disputes between taxpayers and tax administrations on whether a supply is exempt are common and often difficult to resolve. Taken together, a more complex VAT involves greater operational costs and raises uncertainty in the market.

Fourth, the final price of the good rises. Since the VAT is regressive when measured against income, raising the final price of goods increases the regressivity of the tax system. Further, if the good is exported, the exported good will be less competitive in the international market. The destination principle (discussed in section 3.6), under which VAT should be collected in the country of final consumption, will be violated since part of the tax burden remains in the country of production. In short, the exemption may make the VAT more regressive and reduce the international competitiveness of a country, which can exacerbate foreign exchange shortages and reduce export performance.

The VAT consequences are different if the exemption only applies at the retail stage of the production-distribution chain. If the good in the example is subject to VAT at all previous stages of the chain, but exempt when supplied by the retailer, the consequences will be:

Table 7: Effect of VAT exemption at the retail stage

Production-distribution chain	Input VAT	Output VAT	VAT declared
Producer	(0)	400	400
Manufacturer	(400)	1 000	600
Retailer	1 000	Exempt	-
Consumer	Exempt	-	-

Based on these consequences, the VAT- inclusive sales prices will be:

Table 8: VAT-inclusive sales prices with VAT exemption at the retail stage

Production-distribution chain	Purchases (incl. VAT)	Sales (incl. VAT)
Producer	0	4 400
Manufacturer	4 400	11 000
Retailer	11 000	21 000
Consumer	21 000	-

In this scenario, unlike the exemption on intermediate goods or services, the total VAT collected throughout the production-distribution chain has decreased, which means revenues collected decreases. The retailer will not be able to deduct input VAT of 1,000 and will attempt to shift this non-deducted VAT unto the consumer. The consumer will not pay any VAT directly, but will be burdened with the VAT to the extent that the retailer can shift the VAT. However, the final price of the good paid by the consumer has decreased compared to the previous examples.

The consequences of this exemption are different to the previous example. Here, the VAT remains a tax on production, but since the retailer can supply at a lower price compared to the previous examples, they will not be motivated to change their behavior. The exemption is therefore less distortive for producers. However, consumer choices remain distorted since the price has decreased.

The retailer will be required to make input VAT apportionments which, like in the previous example, presents an opportunity for evasion and raises administrative and compliance costs. The same issues related to the application of the correct tax treatment to goods and services are also present under this exemption.

The price of the final good will, however, decrease. This implies that the VAT, when measured against income, is likely to become less regressive, especially if the exemption is on a good or service predominantly consumed by low-income individuals. The likelihood that the destination principle is violated also decreases since the exemption occurs further down the production-distribution chain.[5] VAT will only be collected in the country of export if the retailer exports the good. If the manufacturer exports the good, the zero-rate (as discussed in the next subsection) will take preference over the exemption and no VAT will be collected in the country of export.

In summary, exemptions give rise to several negative consequences. These consequences are more severe where intermediate goods and services are exempt. If exemptions are required for distributional reasons and warrant a reduction in revenues, these should preferably be limited to final consumer goods and services that are disproportionally consumed by low-income individuals.

5 If the exemption is applied earlier in the production-distribution chain and applied to all further stages including the retail stage, the destination principle is more likely to be violated.

2.3.3. Zero-rated supplies under the value added tax

The consequences of a zero-rated supply, which means VAT is charged at nil per cent and input VAT deductions are allowed, will also depend on whether the zero-rate applies to intermediate or final supply of goods and services. Assuming that the supply from the manufacturer to the retailer is zero-rated, but all supplies by the retailer are charged with VAT, the VAT consequences would be:

Table 9: Effect of VAT for zero-rated supplies from manufacturer to retailer

Production-distribution chain	Input VAT	Output VAT	VAT declared
Producer	(0)	400	400
Manufacturer	(400)	0	(400)
Retailer	0	2 000	2 000
Consumer	2 000	-	-

The total amount of VAT collected amounting to 2,000 is the same when compared to the first example where all supplies are subject to VAT. The VAT paid by the consumer is also the same and the burden of the VAT only falls on the consumer. However, unlike the first example, the manufacturer's output VAT exceeds their input VAT.

The major drawback from zero-rate on intermediate goods or services is that the manufacturer's output VAT exceeds their input VAT. If the manufacturer has insufficient output VAT to offset against the input VAT, they will require a VAT refund from the tax authority. If VAT refunds are not promptly paid, the manufacturer may change their behavior and attempt to avoid the refund by vertically integrating with the producer. Or worse, the manufacturer may not purchase the input, which decreases investment in the economy. Moreover, for companies with presence in several countries, the ability to get a refund promptly is an important element when considering where to establish new facilities.

The likelihood of a VAT refund will persist if the supply of final goods or services are zero-rated. Assuming that the retailer makes a zero-rated supply to the consumer, the VAT consequences will be:

Table 10: Effect of VAT for zero-rated supplies from retailer to consumer

Production-distribution chain	Input VAT	Output VAT	VAT declared
Producer	(0)	400	400
Manufacturer	(400)	1 000	600
Retailer	(1 000)	0	(1 000)
Consumer	0	-	-

Unlike the previous example, the total VAT collected throughout the production-distribution chain is reduced to zero, which means tax revenues collected

decreases. The revenue service may be required to refund the VAT collected from the producer and manufacturer to the retailer. The value of the refund has increased from 400 in the previous example to 1,000. The burden on the consumer has decreased from 2,000 to 0.

Compared to the results of an exemption on final supply of goods and services, a zero-rate provides greater relief to consumers, at a greater cost of revenues. It is therefore a more aggressive instrument to reduce the regressivity of the VAT. However, this benefit of the zero-rate is not without costs. The major cost is that it increases the likelihood of a rise in the number and value of VAT refund claims. If VAT refunds are not promptly paid, the input VAT represented by the refund becomes a tax on investment equal to the time value of money. Further, it distorts consumer decisions which may in turn distort production decisions and increase compliance and administrative costs. In short, domestic zero-rated supplies should generally be avoided where administrations struggle to pay VAT refunds promptly.

VAT refunds may also arise where goods and services are exported. The destination principle will apply and the export will be zero-rated in this case. Assuming that the manufacturer exported the good, the domestic VAT consequences will be:

Table 11: Effects of domestic VAT when the manufacturer exports goods or services

Production-distribution chain	Input VAT	Output VAT	VAT declared
Producer	(0)	400	400
Manufacturer	(400)	0	(400)

Since there is no final consumption in the domestic economy, it would be incorrect to say that VAT revenues decrease because of the export. However, a VAT refund may be claimed by the exporter of goods or services. Unlike the previous example, a country cannot reduce the likelihood of this refund by subjecting the export to the standard rate. If VAT refunds to exporters are not paid promptly, these suppliers may be less inclined to export, increasing the trade deficit and likelihood of foreign exchange shortages. This underlines the importance of appropriate VAT refund practices in developing countries, a topic that will receive in-depth attention in another paper in this series.

For the importing country, assuming the same VAT rate, the VAT consequences will be:

Table 12: The effect of VAT on the importing country

Production-distribution chain	Input VAT	Import VAT or Output VAT	VAT collected or declared
Customs		1 000	1 000
Importer (Retailer)	(1 000)	2 000	1 000
Consumer	2 000	-	-

Note that if the country of import applied a different VAT rate to the country of export, the VAT consequences will reflect the rate of the country of import. For instance, if the VAT rate of the importing country was 20 per cent, the import VAT would be 2,000, the output VAT charged to the consumer will be 4,000 and the total VAT collected will also be 4,000.

Besides inter-jurisdictional issues, the importation of goods and services gives rise to other administrative challenges. One challenge is that the importer may not have output VAT to offset against the input on the import VAT, ending in a refund position. This is often observed in sectors with large capital inputs and delays in making taxable supplies, such as in extractive industries. Another challenge is that, since there is a break in the audit chain when goods are exported, the value of the imported goods may be under-declared to evade tax. Although this is of lesser concern for intermediate goods on which input VAT would be deducted, this type of tax evasion is common for small consumer goods where the importer is not registered for VAT or is a final consumer. Limiting this type of evasion is further discussed in another paper in this series.[6]

2.3.4. Reduced rates under the value added tax

The consequences of reduced rates, which means applying a lower than standard VAT rate to certain goods or services, is similar to the consequences of VAT on zero-rated supplies. This is so since a zero-rate is technically also a reduced rate.

However, VAT refunds are less likely to be claimed when applying a reduced rate than a zero-rate. The likelihood of a VAT refund rises as the difference between the rate paid on purchases and the rate charged on supplies increases. Therefore, if a business paid VAT at the standard rate on their inputs, the greater the rate is reduced on its supplies, the more likely a VAT refund becomes.

If the manufacturer in the example paid the standard VAT rate of 10 per cent on its purchases, but only charged VAT at 3 per cent on its supplies, and the retailer also charges VAT at 3 per cent, the VAT consequences will be:

Table 13: Effect of VAT on reduced rates

Production-distribution chain	Input VAT	Output VAT	VAT declared
Producer	(0)	400	400
Manufacturer	(400)	300	(100)
Retailer	(300)	600	300
Consumer	600	-	-

6 See *The Value Added Tax/Goods and Services Tax Treatment of Small Enterprises* (United Nations publication), section 2.1.6, Registration evasion.

In the example, the manufacturer would require a VAT refund and revenue would decrease. Further, the retailer needs to differentiate between supplies taxed at the standard rate and reduced rate, while other supplies may be exempt or zero-rated. The tax authority needs to ensure that the refund or decreased output VAT is not a result of fraud and evasion. The revenue forgone, apart from compliance and administrative consequences of reduced rates lead experts to advise against their application.

2.3.5. Value added tax rate changes

The effect of VAT rate changes on most macro-economic indicators will depend on many country-specific factors and is beyond the discussion of this paper. However, the effect of VAT rate changes on inflation is a general concern surrounding the VAT and is briefly discussed in this section.

If VAT rates are increased or decreased, the effect on consumer prices will depend on the extent producers pass on the VAT to consumers. Although VAT pass-through will depend on country and sector-specific variables, the general finding is that VAT increases are predominantly passed on to consumers, while VAT decreases are passed on to consumers to a lesser extent.[7] In terms of inflation, this means that VAT rate increases are generally inflationary while reducing VAT rates may not be as effective to reduce inflation.

However, the macro-economic concern regarding VAT rate increases is less about whether it increases consumer prices in one period, but whether it has a persistent effect on inflation.[8] Here, the general finding is that the effect of VAT rate increases on inflation is a short-term observation.[9] Increases in VAT rates should, therefore, not pose a major risk to price stability in most contexts.

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7 For more studies on VAT pass-through and its effects, see Kosuke Shiraishi, "Determinants of VAT pass-through under imperfect competition: Evidence from Japan", *Japan and the World Economy, vol. 61, No. 101120 (2022); Dora* Benedek, and others, "Varieties of VAT pass through", *International Tax and Public Finance*, vol. 27, No.4, 890–930 (August); Clemens Fuest, Florian Neumeier and Daniel Stöhlker, "The pass-through of temporary VAT rate cuts: Evidence from German supermarket retail", ifo Working Paper No. 341 (November 2020); Konstantins Benkovskis and Ludmila Fadejeva, "The effect of VAT rate on inflation in Latvia: Evidence from CPI microdata", *Applied Economics*, vol. 46, No. 21, pp. 2520–2533 (2014).

8 There are different ways that the effect may be persistent, depending on the theory of inflation relied upon.

9 See, for instance, E. Gautier and A. Lalliard, "How do VAT changes affect inflation in France?", *Bulletin de la Banque de France*, issue 32, pp. 5–27, (2013); Alina Carare and Stephan Danninger, *Inflation smoothing and the modest effect of VAT in Germany*, International Monetary Fund (IMF) Working Paper No. 2008/175, ISSN: 1018–5941 (2008); Alan A. Tait, "I. VAT policy issues: Structure, regressivity, inflation, and exports", in *Value-Added Tax*: *Administrative and Policy Issues* (Washington, D.C., International Monetary Fund, 1991).

2.4. Value added tax or retail sales tax?

The VAT and the RST differ in their collection mechanisms: the invoice-credit method versus exemption/suspension certificates.[10] The purpose of both mechanisms is to prevent tax from accumulating during the production and distribution stages, ensuring that the tax burden is limited to the final consumption. Under the VAT, producers deduct the input VAT against the output VAT. As shown in the next subsection, the net VAT paid on their costs is therefore zero.[11] The same result is possible by showing exemption certificates: pay nothing, deduct nothing. This is the mechanism of the RST. In theory, both mechanisms only tax consumption. Yet, each mechanism has a different effect on its taxable base, compliance and administration.

Considering the base, the VAT mechanism has one primary advantage over RST. Under a VAT system, the tax is always charged by suppliers, and it is then up to the purchasers to determine whether, and to what extent, the goods and services will be used in further business activities, such as production, distribution or the provision of services. In contrast, under the RST, whether tax is charged is determined at the point of sale with the purchaser showing an exemption certificate or not. Since RST is either fully charged or not charged at all, exemption certificates, unlike the invoice-credit method of the VAT, do not allow the consumption part of dual-use goods and services (part production, part consumption) to be taxed.

Some goods and many services are dual-use in nature and cannot feasibly be included in the base of the RST. In contrast, the base of the VAT can feasibly include all value added in the formal economy, except the value added by small businesses that opt not to register, financial services and residential accommodation services. These sectors are typically exempt under the VAT, meaning that no VAT is charged on sales, but input VAT is not deductible, so some tax is still embedded in the price. The feasible base of the VAT is, therefore, broader than the RST.

The VAT base may also be broader since, unlike the RST, the VAT provides incentives for registration. Since the VAT provides for input VAT deductions, businesses may want to be registered to deduct input VAT and, consequently, charge VAT on their supplies. The RST provides no incentive to register since it is, in theory, only charged on supplies to consumers. This important VAT feature is especially relevant for developing countries that may struggle with extensive informality. Once registered for VAT, other taxes can also be charged and businesses will enter the formal economy.

The VAT and RST also give rise to different compliance costs. The compliance burden and the number of businesses required to be registered under the two taxes differ. Since the VAT requires businesses to account for both inputs and outputs, it may have a higher compliance burden than the RST. Further, retailers and non-retail producers whose supplies exceed the compulsory registration threshold must register

10 The VAT can also be applied using the subtraction method, but the invoice-credit method is the common approach.

11 If the producer makes both taxable and exempt supplies, it will only be able to deduct a portion of input VAT.

and account for VAT, while all retailers must register under the RST. This means the average business may be larger under the VAT, which may make compliance costs less regressive, but more businesses are also likely to be registered under the VAT than RST, which raises administrative costs.

Besides the number of registrants, the administration of the VAT and RST each present its own set of challenges. Two unique challenges under the VAT are the registration of only bona fide businesses and the payment of legitimate refunds. Only registering bona fide businesses is important because the deductibility of input VAT opens the door for fraud. Moreover, VAT refunds are the primary drawback of the VAT's collection mechanism. The RST avoids most of these administrative challenges by exempting dual-use goods and services. Including these would present administrative challenges that cannot feasibly be overcome. However, one administrative challenge that cannot be avoided under the RST is preventing fraud from the use of falsified exemption certificates or the misuse of legitimate exemption certificates for the purchase of consumer goods and services.

An administrative advantage of the VAT over the RST is that, generally, VAT will still be collected even if there is evasion in the supply chain. Under the RST, if tax is not charged at the point of sale, no tax is collected on the value of that sale. Under the VAT, if tax is not charged on a supply, input VAT cannot be deducted and it is only the tax on the value-added component of the supply that is not collected. The VAT is therefore more difficult to evade in its entirety than the RST, which is important for countries with limited administrative capacity.

In summary, the VAT has greater revenue potential compared to the RST. It allows for a broader base, includes incentives for businesses to register and formalize and less revenue is forgone because of evasion. It can exempt small businesses from the tax and avoid regressive compliance costs. These features make the VAT the instrument of choice for developing countries. However, under the VAT, special attention needs to be given to administering VAT refunds, setting the threshold at an appropriate level and only registering legitimate businesses. These issues, among others, are discussed in greater detail in the series of papers to follow.[12]

3. Basic design elements of a value added tax

3.1. Introduction

VAT designs fall between two categories: the modern VAT and the traditional VAT. Modern VAT systems are largely based on the New Zealand goods and services tax system and are characterized by a single positive rate and limited exemptions. These VAT systems tend to be simpler compared to traditional ones and provide substantial tax revenues at relatively low economic costs. Traditional VAT systems are largely

12 See *The Value Added Tax/Goods and Services Tax Treatment of Small Enterprises, An Introduction to Value Added Tax/Goods and Services Tax Refunds* and *The Use of New Technologies to Improve Value Added Tax Compliance* (United Nations publications).

based on the European Union's common VAT Directive (2006)[13] and are characterised by multiple rates and/or a greater number of exemptions and other complexities. These VAT systems generally require higher tax rates than modern VATs to generate similar revenues, which raises the economic costs.

Whether applying a modern or traditional VAT, certain design elements are important to the functioning of the VAT. In this section, we discuss the invoice system of VAT and the decisions involved in defining the tax base, selecting VAT rates, identifying the taxpayer and a brief discussion on inter-jurisdictional issues.

3.2. Value added tax: An invoice-based tax

There are two methods in which the value added by a business can be taxed. The first is similar to an income tax, but rather than profit, the business calculates its value added[14] at the end of a tax period and a tax rate is applied to this value added. The second method applies the tax rate not to the value added by the business directly, but indirectly by applying the tax rate to the components of value-added, which are gross receipts (output taxed) and investment expenditure (input taxed) and allowing input VAT to be deducted from output VAT. This second method relies on VAT invoices to substantiate tax payments and receipts and is, therefore, referred to as the invoice-credit or invoice method. This is widely regarded as the preferred manner to tax value added.

The invoice method is preferred because it creates incentives for businesses to purchase from VAT-registered businesses that charge output VAT, since this output VAT can be deducted as input VAT.[15] In turn, businesses that supply predominantly to other VAT-registered businesses will have a competitive advantage if registered for VAT, resulting in businesses voluntarily registering for VAT. Further, the use of invoices creates a good audit trail and allows for cross-checking with the income tax system. For example, when an input tax deduction is sought based on an invoice for goods or services rendered by a supplier, the supplier's financial statements should reflect the amount received on the invoice as part of its gross income.

The reliance on VAT invoices means that invoices should meet certain requirements to ensure accurate tax collections and limit fraud or evasion. Each country has its own requirements of what constitutes a VAT invoice. At the minimum, it should contain the supplier's taxpayer identification number, name and address, a description of the goods and services to be supplied, the value of the goods and services, the VAT applicable to the supply of goods and services and a date. With respect to international trade in digital goods, simplified electronic invoices may lower compliance costs.

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13 The Directive is published in all official languages of the European Union.

14 The value added would be equal to wages plus business cash flow (referred to the addition method), or equivalently gross receipts reduced by investment expenditure (referred to the subtraction method).

15 Purchases from non-registered suppliers would generally include embedded input VAT since these businesses are not allowed to deduct input VAT on its purchases.

3.3. Defining the tax base

For the VAT to provide substantial revenues at low economic costs, it should be applied on the broadest possible range of goods and services. As discussed in section 2.3, VAT exemptions, domestic zero-rated supplies and reduced rates give rise to many negative consequences. However, the possible range of goods and services that can be taxed would differ substantially between countries because of economic, social and political differences.

A common concern when applying a broad-based VAT is that it may disproportionately affect low-income households. While the overall equity of a tax system should be assessed by considering both taxation and public expenditure, it is generally the case that a uniform VAT applied to all goods and services is regressive, which means that, as a share of income, low-income individuals pay a greater amount of tax than higher-income individuals. To mitigate this regressivity, countries can increase tax redistribution to low-income households or apply targeted zero-rating or exemptions to a limited number of goods and services that represent a larger share of consumption by these groups (see section 4). Besides these concessions, certain supplies are hard-to-tax under the VAT, such as financial services,[16] residential accommodation and agriculture in low-income countries. In addition, the destination principle, as further discussed in section 3.6, requires that exported goods and services are zero-rated.

Concessions are often applied for other reasons. They might be granted to provide tax incentives, increase domestic production, influence consumer behaviour towards pro-social choices and alleviate political pressures. As far as possible, concessions for these reasons should not be included in the VAT since there are other tax instruments better suited to support these objectives. Also, once concessions are granted, they are hard to remove. VAT concessions often lead to further concessions, a phenomenon referred to as exemption creep.

3.4. Selecting the value added tax rate

An important design decision is whether to apply a single VAT rate or multiple rates. Some countries apply multiple rates, relying on an inverse elasticity approach, that is, to levy a lower tax on commodities for which the demand is more elastic (where price changes give rise to large demand changes) and higher taxes on inelastic commodities (where price changes give rise to small demand changes) to minimize the impact of taxation on consumption patterns. A challenge with this approach is that many inelastic commodities tend to be basic necessities, which means higher taxes on these commodities may be regressive. Other countries, therefore, apply lower rates on basic necessities, which are inelastic commodities. As a result, the VAT may be more equitable but becomes more distortive when compared to a single VAT rate.[17]

16 In South Africa, only a limited number of financial services are exempt while in Angola, the financial service sector is fully exempt from VAT.

17 In some cases, placing higher taxes on certain commodities is necessary to achieve a specific environmental or health objective. For example, higher taxes on tobacco, alcohol and fossil fuels. But, when applying a higher tax burden on these commodities, using excise taxes is preferable to the VAT.

In some countries, lower VAT rates are applied to stimulate economic activity in certain sectors. For example, the tourism sector in Myanmar is taxed at a reduced VAT rate. Such differentiated VAT rates for different sectors or types of commodities create substantial competitive distortions, opportunities for avoidance and evasion, additional administrative burden for tax administrations and higher compliance cost for taxpayers. It results in a much more complex VAT. For example, in India the first standard rate of 18 per cent applies to services such as telephone, banking, insurance and restaurants with alcohol license, as well as to goods such as tickets to cultural events and cinema, televisions and gaming consoles, while the second standard rate of 12 per cent applies to non-air-conditioned restaurants, construction, intellectual property, some foodstuff and mobile phones. A reduced rate of 5 per cent applies to privately provided transport, advertising, sugar, tea, coffee and medicine, while the zero-rate applies to basic foods, postal services, books and newspapers. In India, costly field-audits are required to ensure that restaurants that have both air-conditioned and non-air-conditioned sections apply the appropriate VAT rate on food supplied to its patrons. It is also costly on the supplier to print different menus for the air-conditioned and non-air-conditioned sections of the restaurant.

In general, the choice between a single positive rate and multiple rates is premised on administrative and compliance considerations. It cannot be emphasized enough that differentiated VAT rates create an additional administrative burden on the tax authority as well as the taxpayer. Moreover, the prevalence of VAT fraud is higher in VAT systems with multiple VAT rates. Therefore, a single positive VAT rate is generally preferred to multiple VAT rates.

3.5. Identifying the taxpayer

Not every supplier of goods or services is VAT-registered, and is therefore, a VAT taxpayer. The difficulty of administering VAT in fragmented economies and in those with large informal sectors often requires countries to impose a VAT registration threshold, below which businesses are not required to register. Simplified schemes may then apply to businesses operating below the registration threshold.

The registration threshold and other simplified schemes are discussed in detail in the paper titled *The value added tax/goods and services tax treatment of small enterprises*, while exemption of certain entities is further discussed here, specifically government entities, charities and donor-funded projects.

3.5.1. Government entities

Generally, government entities (except entities that provide service delivery such as water, electricity, telecommunication and entertainment to identifiable consumers) provide services for the public good. For example, the national defence force protects the public at large. The service it renders cannot be attributed to a specific recipient nor do they provide services in exchange for payment. They are, therefore, not obliged to register for VAT or their specific supplies are exempt.

Such entities pay input VAT on their purchases from businesses. Yet, they generally do not recover this input VAT from the recipients of the service that they render.

When government entities are not registered for VAT, the cost of unrecoverable input VAT must be absorbed as a budgetary expense. In some cases, governments may implement input VAT rebate mechanisms, decreasing tax revenues.[18] It is important to note that, government entities that provide services to identifiable recipients — such as electricity, water, or education — are usually required to register for VAT. This is because they supply services in exchange for payment and are able to charge VAT to their customers, the same way private sector providers do.

3.5.2. Charities

Charities and non-profit public benefit organizations generally provide goods and services for no payment. As such, the goods and services they provide do not attract VAT. For this reason, most countries exempt the supplies of charities and non-profit public benefit organizations from VAT or do not permit these entities to register for VAT. However, as these entities often fulfil socio-economic needs that the government is unable to fulfil, some tax benefits for these entities may be considered. For example:

- A charity may be allowed to register for VAT to recover the input VAT paid on the consumables it acquired in the making of charitable supplies, effectively applying a zero-rate on the supplies of charities.
- Donations of products made by a business to a charity could be relieved from VAT (where they might otherwise be subject to a deemed output rule or an input VAT restriction).

Such rules reduce tax revenues but provide other benefits. The charity benefits from the goods donated, while businesses are able to dispose of inventory that they no longer need or would otherwise like to put towards social or humanitarian causes, without incurring additional costs as compared to disposing of those goods for example, a landfill. Given such a rule encourages recycling or reuse of products over disposal, there is a direct environmental benefit.

To avoid fraudulent use of these tax benefits, anti-avoidance rules can be put in place. For example, a charity may need to apply to the government (for example, the minister of finance) to be recognized as a charity. Moreover, only charities recognized by the government, and whose names are published by the relevant government department, may benefit from the relief. There may also be documentation requirements to certify, e.g., that inputs were incurred in the course of charitable activity or that a charity to whom goods were donated is indeed a charity for whom VAT relief applies.

3.5.3. Donor-funded projects

Similar to charities, some projects for the public good are conducted by entities that are funded by donations. Special arrangements can be made for these projects to register for VAT to allow them to claim input VAT on the commodities acquired in

18 Input tax rebates would remove competitive distortions of government entities preferring to purchase from other exempt government entities to decrease the amount of non-deductible input VAT.

the making of supplies under the donor-funded project. Another concession is to exempt the donation received by the entity from VAT. Importantly, to avoid abuse, the donor-funded project must operate within strict parameters in order to qualify for the VAT concessions. For example, they may require that: the funding originates from a foreign non-vendor entity, the project must be administered and completed by a government-recognized non-profit organization or the project must be aimed at achieving one or more of the Sustainable Development Goals (SDGs) set out in the United Nations 2030 Agenda.

3.6. International trade

The overarching purpose of a VAT is to levy a tax on final consumption in the taxing jurisdiction, and VAT laws must, therefore, have mechanisms for limiting their scope to domestic consumption and excluding foreign consumption. There are in theory two possible mechanisms for allocating taxing rights, the destination principle (which allocates taxing rights to the country of consumption) and the origin principle (which allocates taxing rights to the country of production). Perhaps because it seems intuitively correct to tax consumption where it takes place,[19] but also because it has been sanctioned by World Trade Organization (WTO),[20] the destination principle is the most widely used approach, making the origin principle a point of comparison rather than a competing principle. It is generally agreed that, under the destination principle, the tax rate on consumption should be determined by the rate applicable in the country of consumption, and all the tax revenue should accrue to that country.

Despite the widespread use of the destination principle, its implementation in practice is complex, particularly because VATs are structured as multi-stage transaction taxes, which tax both business-to-business (B2B) transactions (which do not involve consumption) and business-to-consumer (B2C) transactions (which do). In this context, implementing the destination principle requires particular attention to the treatment of cross-border transactions to ensure that the place of taxation for exported goods or services is the country of import. Where goods or services are supplied from Country A to Country B, the destination principle requires that Country A does not tax the supply and also refunds any VAT charged at earlier stages in the transaction chain; Country B should then recommence the chain of taxation by imposing VAT on the imported goods or services at the rate applicable for similar domestic transactions.[21] The neutrality principle is an integral part of the VAT system, since it is only by ensuring that VAT does not operate as a tax on business that

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19 Liam Ebrill and others, eds., *The Modern VAT* (Washington, D.C.: International Monetary Fund, 2001) p. 180.

20 See, World Trade Organization, Agreement on Subsidies and Countervailing Measures, Part 1, Article 1, Footnote 1. Retrieved from https://www.wto.org/english/docs_e/legal_e/24-scm.doc.

21 Unless, of course, Country B does not operate a VAT system, in which case no VAT will be charged and the goods will be sold without a tax burden from the countries of production.

exported goods or services can be free of any VAT imposed at earlier stages in the chain of production and distribution.[22]

There are nonetheless considerable differences in the ways that countries understand the destination principle and implement it in their laws, and there is no VAT equivalent to the model tax treaties and networks of bilateral tax treaties that exist for income tax. In the case of goods, physical border controls make it easier to identify exports and verify the exporter's entitlement to a refund of any previously imposed VAT. Similarly, border controls provide a point at which imports can be identified and taxed, although collecting tax on low-value goods has traditionally been problematic. In contrast, for services, the intangibility of the supplies means that border controls cannot be used to determine the place of taxation. Instead, the place of taxation is determined by reference to features of the transaction that are likely to most accurately predict the place of consumption.[23]

While a detailed analysis of how various countries implement the destination principle is beyond the scope of this paper, one point of particular recent focus has been the enhancement of the capacity of countries to collect VAT on "imported" services (particularly digital services) and on importations of low-value goods.[24] This work focuses on collecting VAT from foreign suppliers (something previously not thought feasible) or from the online platforms through which the supplies are made or facilitated. Without going into detail, some of the key considerations for countries wishing to implement these enhancements to their VAT regimes include the following:

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22 The neutrality principle recognizes that VAT should not operate as a tax on business because the VAT burden is intended to fall only on final consumption, not on intermediate business transactions.

23 The OECD set out, in 2017, its recommendations on the key outcomes that countries should achieve through their 'place of taxation' rules for services in the *International VAT/GST Guidelines* (Paris, 2017). The focus on outcomes means that the Guidelines do not dictate the form in which the place of taxation rules giving effect to the destination principle should be drafted. The Guidelines also cover the neutrality principle, both in domestic and international trade. Since 2017, the Guidelines have been supplemented by OECD publications on collection mechanisms for VAT on cross-border trade, and more recently, on the implications of the sharing and gig economies: See, *Mechanisms for the Effective Collection of VAT/GST* (Paris, 2017); *The Role of Digital Platforms in the Collection of VAT/GST on Online Sales* (Paris, 2019); *The Impact of the Growth of the Sharing and Gig Economy on VAT/GST Policy and Administration* (Paris, 2019).

24 The impetus for such changes arose out of the work of the OECD, most recently its work on collection mechanisms for VAT on cross-border trade (infra), and also from a series of toolkits to implement such regimes, which have been developed jointly by the OECD, the World Bank, and regional organisations, namely, *VAT Digital Toolkit for Africa* (OECD, World Bank Group and African Tax Administration Forum, 2023), *VAT Digital Toolkit for Asia and Pacific* (OECD, World Bank Group and Asian Development Bank, 2022) and *VAT Digital Toolkit for Latin America and the Caribbean* (OECD, World Bank Group, Inter-American Center of Tax Administrations and Inter Development Bank, 2021). The toolkits provide step-by-step guidance for the design and implementation of the recommended approaches for the collection of VAT on digital trade, taking account regional circumstances and challenges.

— Determining the extent of any required tax base expansions:
  - Analyse the existing place of taxation rules to assess whether current legislation adequately covers the full range of imported services and/or low-value goods the country wishes to tax.
  - Decide whether to impose tax on all imported services or only certain specified digital goods and services; if the latter, carefully consider the chosen definitions to ensure that no unintended inconsistencies will arise.[25]
  - Enact clear and unambiguous place of taxation rules to ensure the intended tax base is covered; if feasible, consider providing extensive guidance on the operation of the new rules.
  - Determine whether a distinction will be made between the collection mechanisms for supplies to consumers (B2C) and supplies to businesses (B2B); in either case, carefully consider which aspects of the compliance and administration framework need to be modified and/or strengthened.[26]
  - Consult closely with businesses from the outset in order to ensure that the changes are effectively implemented; grant appropriate lead times for businesses and tax administrations to ensure that any changes to the VAT rules will work smoothly in practice.

— Ensuring neutrality:
  - Assess existing legislation for symmetry with the treatment of outbound transactions in order to minimize the risks of double taxation or unintended non-taxation.[27]

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25 If some (or all) imported services are already within scope but have not previously been collected, consider whether the existing scope needs modification.

26 Many countries apply the new regimes for collecting VAT from non-resident suppliers and/or digital platforms only to business-to-consumer (B2C) supplies and not to business-to-business (B2B) supplies, using a reverse charge mechanism for the latter. This facilitates the use of simplified registration and compliance regimes and is coupled with a risk management approach to audit. However, this approach requires an effective mechanism for customer tax status verification, which can be difficult if there are issues with the integrity of taxpayer registers or challenges with deployment of technology such as application programming interfaces (APIs) for real time verification. In the face of such difficulties, some countries choose not to differentiate between B2B and B2C, but this comes with its own risks, particularly when it comes to verifying input tax deductions for business purchasers. Responses to these risks generally move away from the simplified approach by adding obligations such as withholding mechanisms for non-compliant non-resident suppliers (a response to limitations on the revenue authority's capacity to enforce jurisdiction against non-residents) and/or requiring suppliers/platforms to submit schedules of transactions (to assist in verifying business customers' input tax deductions).

27 If the legislation, as amended, asserts jurisdiction to tax an inbound transaction (a supply of services or a supply of low-value goods for importation), the law should ensure

- Consider how foreign businesses and/or platforms that should be registered can be identified and determine what measures (including simplifications to procedures, appropriately structured to protect the tax base) will encourage compliance.
- Consider whether to implement a simplified 'pay only' registration system[28] and whether—and under what conditions—foreign suppliers and/or platforms should be allowed to register under the standard registration system.
- Consider what level of threshold for registration should apply, taking into account the threshold that applies to domestic businesses.

4. Is the value added tax regressive?

Consumption taxes, such as VAT, are commonly considered regressive as they disproportionately affect lower-income individuals who spend a higher proportion of their income on consumption[29]. The regressivity or progressivity of VAT in developing countries is a debated topic, and a large informal sector may affect the burden distribution of the VAT.

This section discusses the evidence of the burden distribution of VAT in developing countries, including the role of the informal sector. The literature on VAT pass-through to prices and the distribution of the tax burden is summarized, and finally, the section weighs the potential policy options and examines their viability in addressing equity concerns arising from the VAT in a developing country context.

4.1. General burden distribution of value added tax

A VAT applied to all goods and services consumed in the domestic economy will be regressive when measured against income. However, such VATs are not found in practice, especially in the context of a developing country. Policy measures, such as VAT exemptions, zero-rates, reduced rates and the registration threshold influence the burden distribution of the VAT.

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that the same outbound transaction (services supplied to another country or low-value goods supplied for export to another country) are not taxed, with any input VAT being fully recoverable.

28 Under such a system, foreign suppliers or platforms remit the VAT they collect on goods and services sold into the country but are not entitled to deduct input tax. Since the suppliers or platforms have no local presence, they are likely to have little or no input tax burden, which means that such simplified systems can be consistent with the neutrality principle. Applying simplified systems may present challenges in countries that require non-resident suppliers or platforms to remit VAT on both B2B and B2C because the simplifications may make it more difficult to obtain adequate information to verify input claims by VAT-registered customers. On the other hand, imposing more complex systems may have implications which should be carefully considered from the outset.

29 In Economics, this stylized fact is formalized in Engel's law.

A study on the burden distribution of the VAT in Bangladesh revealed that the burden of the VAT is disproportionately higher for lower-income individuals compared to those in higher-income groups.[30] However, when certain goods and services are made exempt from the VAT, the burden decreases for lower-income individuals. This finding is consistent with previous research conducted by Fourie (1993) in South Africa, which also discovered a significant degree of regressivity in VAT and showed that zero-rating creates a significantly more even distribution of burden.[31]

In Pakistan, research found that the goods and services tax (GST) is slightly progressive because many goods and services consumed by lower-income individuals are exempt from GST.[32] The VAT system in the Dominican Republic is very progressive as the tax administration focuses on collecting taxes from establishments where the cost of collection is low, which tends to be large, formal businesses.[33] The study recognises that tax administrations do not to put much effort into the collection of indirect taxes from small shops and open markets because the cost of tax collection is likely to be greater than the VAT revenues collected.

An analysis of the distribution of the VAT burden in Ghana and benefits from VAT exemptions across different households revealed that changes in VAT rates between 1998 and 2015 caused a shift in the distribution of the VAT burden from progressive to regressive when measured against income.[34] The trend was primarily caused by changes in household consumption expenditure, particularly among low-income households, which saw increased spending on necessities like housing, utilities, transportation and communication. The study also found that as the VAT rates increased, the distribution of benefits from VAT exemptions and zero-rate favoured richer households relative to lower-income households, possibly because of changes in consumption dynamics, gross abuses of the generous exemptions, or high-income taxpayers consuming more of these products.

These results suggest that despite attempts to alleviate VAT burden on low-income individuals through VAT concessions, the burden distribution may remain regressive when measured against income. Since attempts to reduce the VAT burden on low-income households would reduce tax revenues, careful consideration is required to ensure that exemptions, zero-rates, or reduced rates are not predominantly a tax benefit to higher-income households and that the resulting tax expenditure warrants the reduction in regressivity of the VAT.

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30 Nahida Faridy and Tapan Sarker, "Incidence of value added tax (VAT) in the developing countries: A case in Bangladesh", *International Journal of Trade, Economics and Finance,* vol. 2, No. 5 (October 2011), pp. 437–442.

31 F.C.v.N. Fourie and A. Owen, "Value-added tax and regressivity in South Africa", *South African Journal of Economics,* vol. 61, No. 4 (December 1993), pp. 281–300.

32 Saadia Refaqat, "Social incidence of the general sales tax in Pakistan", International Monetary Fund Working Paper, No. WP/03/216 (International Monetary Fund, 2003).

33 Chun-Yan Kuo, Hatice Jenkins and Glenn Jenkins, "Is the value added tax naturally progressive?", Working Paper, No. 1059 (Queen's University Economics Department, 2006).

34 Francis Kwaw Andoh and Richard Kwabena Nkrumah, "Distributional aspects of Ghana's value-added tax", *Forum for Social Economics,* vol. 51, No.4 (2022), pp. 394–414.

4.2. Measurement of welfare

A further consideration is whether current income, as the aforementioned studies focused on, is the preferred indicator of welfare to assess the burden distribution of the VAT. As argued by Caspersen and Metcalf (1994), consumers may make consumption choices based on lifetime income and not current income. In other words, if a consumer expects to have increased current income in the future, it may increase its expenditure today. If this is the case, consumption may be a better indicator of welfare than current income.

A VAT is applied to all goods and services consumed in the domestic economy will be proportional when measured against consumption. It is therefore no surprise that studies that measure the burden distribution of the VAT in practice against consumption, or another measure of lifetime income, find that the VAT is proportional or slightly progressive.[35]

4.3. Informality and the burden distribution

Besides VAT concessions and how welfare is measured, whether consumers purchase goods or services in the formal or informal economy can make a substantial difference in the burden distribution of the VAT. Informal businesses are often not registered for VAT, which means no VAT is charged on their value-added components. Further, these businesses may purchase from other non-registered firms to reduce the amount of non-deductible input VAT. It may therefore be that much of the value-added component is untaxed when consumers buy goods and services in the informal economy. This is particularly important in many developing countries, where low-income individuals tend to purchase goods and services more frequently from informal businesses, while higher-income individuals tend to purchase in the formal economy. If the effective VAT rate passed on to consumers is higher in the formal economy than in the informal economy, such purchase patterns will reduce the regressivity of the VAT.

Brusco (2022) provides evidence of the existence of VAT pass-through effect in the informal sector of India's manufacturing industry. The study found that the pass-through effect in the informal sector is lower compared to the formal sector. However, prices in the informal sector still respond to changes in the VAT rate.[36] The lower pass-through in the informal sector means that the tax burden on consumers is lower when purchasing in the informal economy compared to the formal economy.

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35 Alastair Thomas, "Reassessing the regressivity of the VAT", *Fiscal Studies, vol.* 43, No. 1 (September 2021), pp.23-38; Erik Caspersen and Gilbert Metcalf, "Is a value added tax regressive? Annual versus lifetime incidence measures", *National Tax Journal,* vol. 47, No. 4 (December 1994), pp. 731–746.

36 Giacomo Brusco and Tejaswi Velayudhan, "VAT incidence in real VAT systems", Revised and resubmitted, *Journal of Public Economics,* 11 November 2024, Available at https://drive.google.com/file/d/1iNcW0Gmkp279U2FlhbdxR3W9XW3JnLPZ/view?usp=drive_link.

Bachas (2020) found that in 32 low-and middle-income countries, as income increases, the proportion of the budget spent on informal stores decreases, resulting in a higher effective tax rate on higher-income households, making the tax progressive. He found evidence of tax pass-through for informal stores (14 per cent) and formal stores (77 per cent) following a VAT increase reform in Mexico. He further applied the estimates to the whole sample and the study showed that VAT is progressive in all of these countries after accounting for the pass-through of taxes to informal prices.[37]

Arsic and Altiparmakov (2013) using Serbian data, finds that VAT tends to be more progressive in developing countries, owing to the substantial presence of subsistence farming of food.[38] This research suggests that in developing countries with large informal sectors that rely on subsistence farming, the VAT system may not be as regressive as it is in developed countries where the informal sector is less prevalent, and households rely more on the formal markets for their food needs.

In summary, the size of the informal economy in developing countries, combined with differences in the consumption patterns of low- and high-income individuals, may reduce the regressivity of the VAT or even result in a progressive VAT when measured against income. This result seems more likely in contexts where low-income individuals rely on subsistence farming or purchase goods, especially food, from informal markets that are not registered for VAT.

A key take-away is that applying a standard rate to goods or services commonly consumed by low-income households does not necessarily increase their tax burden. The burden only increases where VAT is actually charged on, or embedded in, the purchases made by these households.

4.4. Policy considerations

It should be recognized that the VAT is part of a broader tax and expenditure system. Therefore, it may be argued that equity considerations should be based on the combined impact of this entire system, rather than on the distributional effect of a single tax. Thus, other policy instruments may be more effective in alleviating the tax burden on low-income households than changes to the VAT design. These may include increasing the progressivity of the income tax, or expanding direct cash transfers to those households.

However, in many developing countries, policy changes to the VAT system may be required to address equity concerns. This may be the case where direct cash transfers cannot effectively reach most low-income households, and where the minimum threshold under the income tax is already appropriately high. There are several options:

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37 Pierre Bachas, Lucie Gadenne and Anders Jensen, "Informality, consumption taxes, and redistribution", *National Bureau of Economic Research,* Working Paper 27429 (June 2020).

38 Milojko Arsić and Nikola Altiparmakov, "Equity aspects of VAT in emerging European countries: A case study of Serbia", *Economic Systems,* vol. 37, No. 2 (June 2013), pp. 171–186.

— Exempt certain goods and services which are disproportionately consumed by lower-income groups, and which are likely to be charged with VAT or include embedded VAT. The negative consequences of VAT exemptions, as discussed in section 2, need to be considered in determining whether the benefits of reduced regressivity outweigh the costs of the exemption.

— Zero-rate certain goods and services that are disproportionately consumed by lower-income groups, and are likely to be charged with VAT or include embedded VAT. This option may be more effective at addressing equity concerns under the VAT than a VAT exemption, but would result in a greater reduction in revenues and increase the amount of VAT refund claims. In countries that struggle to administer VAT refunds, the refund implications of this policy option should be carefully considered.

— Reduce the VAT rates on certain goods and services that are predominantly consumed by low-income households and which are likely to be charged with VAT or include embedded VAT. With the option of applying exemptions or zero-rates, this option may not be required, especially since multiple rates can significantly increase the complexity of the VAT and, thereby, compliance and administrative costs. They may also give rise to an increase in VAT refund claims.

— Apply higher rates on certain goods and services that are primarily consumed by higher-income households. However, this approach is less efficient than alternative instruments, such as increasing the progressivity of the income tax or applying excise taxes to luxury goods, which are typically more effective at achieving equity objectives.

— Provide direct VAT recovery to low-income individuals. Sometimes referred to as "personalized VAT" this system involves repayment of VAT to qualifying individuals equal to the amount of VAT paid on a selection of goods and services. However, this requires a robust digital system to accurately calculate the repayments of VAT and track eligibility. It may also be vulnerable to fraud through misrepresentation. If a system with adequate safeguards against fraud can be implemented, personalized VAT could serve as a targeted alternative to broad VAT concessions at addressing equity concerns.

5. Compliance and administration of value added tax

VAT administration involves several key elements, including registration, reporting and compliance. These elements are designed to ensure that businesses and individuals comply with VAT laws and regulations, and that the government can collect the appropriate amount of tax revenue. They are also elements that determine the complexity of VAT compliance. Thus, it is imperative that they are geared to facilitate voluntary compliance. A tax system can be notionally perfect but deemed inadequate if it is challenging to implement and manage (International Monetary Fund, 1992).

There are several key elements of VAT administration that a tax authority must manage to collect and enforce the tax effectively.

5.1. Registration

The registration and identification of each taxpayer is fundamental to key administrative processes such as filing, payment, assessment, collection and reporting to government authorities (International Monetary Fund /Tax Administration Diagnostic Assessment Tool—TADAT, 2019). The goal of Performance Outcome Area 1 of the TADAT[39] Field Guide 2019 is to have all businesses, individuals, and entities that are required to register included in the taxpayer registration database. It espouses that the information in the database should be complete, accurate and up-to-date.

Businesses are typically required to register for VAT if they make or exceed a certain threshold of supply of taxable goods or services. This may differ from general registration for tax purposes as persons may be registered for income or other taxes, but not be liable to register for VAT purposes because they do not meet the threshold for VAT registration or do not make taxable supplies.[40] Most jurisdictions that apply a VAT registration threshold make provisions for voluntary registration by persons who do not exceed the threshold but can meet certain requirements, such as appropriate record-keeping. Notwithstanding the above, it is ideal for the taxpayers to have one identification number throughout the tax system. Having one taxpayer identification number (TIN) streamlines administrative processes, enhances tracking and auditing, curtails evasion and fraud that may result from a multiplicity of TIN, optimizes data management, improves taxpayer services, facilitates integration with other systems, mitigates the need for multiple databases and is therefore cost-effective, bolsters compliance, minimizes errors such as mismatches or duplications, and promotes transparency and accountability. However, its implementation can pose challenges in countries with complex legacy systems.

VAT registration in developing countries can be a complex and challenging process because of issues such as lack of capacity within the tax administration, weak legal frameworks and lack of compliance among businesses.

Unreliable or inaccurate information can severely undermine the effectiveness and integrity of a tax administration. According to the TADAT assessments, many African tax administrations struggle with this issue, particularly at the registration stage. This includes misclassification of taxpayers into their respective sectors. This problem makes it difficult for tax administrations to plan for revenue mobilization and effectively evaluate the impact of tax policy changes on specific sectors or segments. A survey by the African Tax Administration Forum (ATAF) in 2018 although specific to construction industry, shows that 63 per cent of participating

39 The Tax Administration Diagnostic Assessment Tool (TADAT) is designed to provide an objective assessment of the health of key components of a country's system of tax administration. This framework focuses on nine key performance outcome areas that cover most tax administration functions, processes and institutions.

40 See *The Value Added Tax Treatment of Small Enterprises.*

tax administrations could not ascertain the number of taxpayers registered for VAT purposes while 50 per cent of the respondents (taxpayers) indicated that they had insufficient knowledge about their VAT obligations including registration.

The TADAT Field Guide 2019 suggests that tax administrations can improve their efficiency and effectiveness by implementing certain practices such as using unique TINs, maintaining accurate and reliable databases, identifying and flagging dormant registrations, ensuring the authenticity of registration applications and implementing initiatives to detect unregistered businesses and individuals.

Additionally, the guide also describes the essential elements of an information technology (IT) system that can support these initiatives. These elements include validating TINs with check digits, linking associated entities with related parties, mitigating the risk of duplicate or conflicting records, interfacing with other IT subsystems to support filing and payment enforcement, providing a whole-of-taxpayer view of a taxpayer's details across all core taxes, allowing for deactivation or deregistration of taxpayers and archive information, generating registration-related management information, providing an audit trail of user access and changes made to registration data, and providing secure online access to businesses and individuals to register and update details.

The International Survey on Revenue Administration (ISORA) survey results for 2018 indicate that in-person registration remains the most common method among surveyed countries, with 93.6 per cent offering it. However, there has been a significant increase in the availability of digital registration channels, such as online or through apps, with 73.7 per cent of countries offering this option in contrast to 55.8 per cent for paper registration via mail. The survey also revealed a significant gap in adoption of digital registration channels between high-income and low-income countries, with 92.2 per cent of high-income countries utilizing them compared to 38.9 per cent of low-income countries. This highlights the need for digitalization efforts in low-income countries to enhance tax administration and revenue mobilization.

5.2. Invoicing

VAT-registered taxpayers are typically required by law to issue VAT invoices. The invoices must include the VAT amount charged, as well as the VAT identification number of the business, among other information which may differ across jurisdictions.

A VAT invoice is crucial in the VAT system as it serves as a cornerstone for determining VAT liabilities on transactions involving goods or services. It does not only facilitate the accurate calculation of the tax due by suppliers, but also enables VAT-registered customers to reclaim the VAT they have been charged, thereby ensuring transparency and compliance within the tax framework. Furthermore, VAT invoices are essential for tax control purposes, as they provide concrete evidence of the transactions between suppliers and purchasers. This documentation is vital for both parties - the purchaser needs the original invoice to support VAT credit claims on deductible inputs, while a copy must be retained to facilitate the tax administration's verification of reported sales and claimed purchases. This documentation

process underpins the integrity of the VAT system, ensuring that liabilities are accurately established and that entitlements to tax deductions are properly justified.

VAT invoicing can be a complex and challenging issue for tax administrations in developing countries. The lack of compliance among small and medium-sized enterprises (SMEs) is a major concern. These businesses may not fully understand their VAT obligations, keep accurate records or issue proper invoices. This can make it difficult for tax administrations to assess and collect VAT effectively, which can lead to a loss of revenue for the government.

While the use of technology, such as electronic invoicing in Chile, Rwanda and Peru has facilitated compliance, the lack of technology infrastructure still poses a challenge, as many developing countries may not have the necessary infrastructure to support electronic invoicing and other digital systems. This can make it difficult for tax administrations to track and analyse VAT data, which can further complicate the compliance and enforcement of VAT laws and regulations.

5.3. Reporting and payment

Submitting tax declarations, also known as tax returns, is the primary method by which a taxpayer's tax liability is determined and the amount due to be paid is established. (International Monetary Fund TADAT 2019).

VAT-registered persons are required to submit VAT returns to the tax authority on a regular basis, typically monthly or quarterly. The returns must include the amount of VAT collected on sales (output VAT) and the VAT paid on business inputs (input VAT) during the reporting period. The business must also pay the net VAT payable to the tax authority by the deadline for filing the return.

According to the Inter-American Center of Tax Administrations (CIAT), most tax administrations in Latin America and the Caribbean (LAC) require VAT to be reported and paid on a monthly basis. Out of 19 LAC jurisdictions, 18 allow or require monthly filing, although other filing frequencies may apply to specific categories of taxpayers. For example, 16 per cent of jurisdictions allow bi-monthly filings, 5 per cent allow quarterly filings, 21 per cent allow semi-annual, and 26 per cent allow annual filings (CIAT 2016).

Considering that filing of tax returns remains a critical process for all jurisdictions, on-time tax return filing is increasingly being used as a critical performance indicator in tax administration (IMF ISORA 2021). The Performance Outcome Area 4 of the TADAT Field Guide 2019 provides three performance indicators for evaluating timely declaration of tax returns. They are the on-time filing rate, management of non-filers and use of electronic filing facilities.

Based on the ISORA 2018 survey report, the global on-time filing rate for VAT is 86 per cent, which is higher compared to other major tax categories and has been stable from 2015 to 2017. In both 2017 and 2015, higher-income areas consistently had higher filing rates for all taxes than other groupings. Small States have lower on-time filing rates, which may be related to a lack of progress in tax administration, challenges brought on by scale, and an inability to benefit from specialization in

contemporary tax administration (IMF ISORA 2021). According to CIAT, the rate at which returns are filed in LAC varies based on the frequency of reporting with 66 per cent of monthly forms submitted on time, while the percentages decrease to 50 per cent and 49 per cent for bi-monthly and quarterly reports, respectively.

In terms of filing channel, 79 per cent of returns were filed electronically in LAC, with the highest percentage being for monthly returns (81 per cent), followed by semi-annual (79 per cent) and annual (31 per cent) returns. Similarly, electronic payments were made for 74 per cent of monthly payments and 31 per cent of semi-annual payments (CIAT 2016). For African jurisdictions, 73 per cent of the tax administrations have an online filing system and 88 per cent have an online payment system, with the use of mobile payment systems being at 57 per cent.

Notwithstanding the progress made in online filing and payment, more is to be done to improve the on-time filing and payment rate in developing countries. The comparative analysis of TADAT assessments in Africa shows that on-time filing of declarations and on-time payment of tax liabilities rates are low (ATAF & TADAT 2022).

5.4. Refunds

The process for claiming VAT refunds can be complex and time-consuming, and taxpayers may need to provide documentation and proof of their eligibility for the refund.[41]

Jurisdictions have varying rules on the treatment of refunds, ranging from cash refunds to VAT credits to be set-off against future output VAT or other taxes. The VAT refund offset is practiced in jurisdictions such as Kenya, Angola, Colombia, Pakistan, Cameroon, Ethiopia, Mexico, Belarus and the United Republic of Tanzania. It is important to note that some of the jurisdictions may also have a cash refund system for claims of certain values or conditions.

VAT refunds typically constitute around one-third of gross VAT revenue. In the European Union, refund levels are higher, generally ranging between 40 and 50 per cent, while in regions such as Africa, Asia and Latin America, they are much lower, often below 20 per cent and in some cases even under 10 per cent. In many developing countries, low refund levels are the result of a combination of several factors, such as inadequate or limited infrastructure and technological capacity to track and monitor VAT transactions, complex or burdensome refund rules and procedures, insufficiently trained personnel to administer refunds, weak transparency and accountability in public financial management systems, and in some cases, a lack of political will to prioritize VAT refund processes amid competing demands for government resources and attention.

In addition to the challenges described above, anti-fraud measures related to VAT refund rules can also become impediments to the efficiency of the process. For example, some jurisdictions require that VAT refund applications must be made by the taxpayer, accompanied by the submission of additional documents and /or a

41 More specifically, see *An Introduction to Value Added Tax/Goods and Services Tax Refunds* (United Nations publication).

verification exercise (tax audit). In Africa, these procedural requirements have created significant delays. While it takes an average of 28 hours to prepare and submit a VAT refund claim, the time it takes to actually receive the refund ranges from 38.6 to 109.9 weeks (van Oordt, 2021).

The comparative analysis of African tax administrations that have undergone TADAT assessment found that in most cases, the processing time for VAT refunds is not tracked, and even when it is, the refunds are not issued in a timely manner. They found that only 10 per cent granted refunds in line with the minimum internationally accepted practice, which requires at least 7 per cent of claims to be paid, offset, or declined within 30 days. It also found that the process for granting VAT refunds is not risk-based, as 8 per cent of the assessed tax administrations do not have a risk-based process for VAT refunds, thus resulting in delayed refund processing.

Notwithstanding the above, good practices can be found in some developing countries. A risk-based approach in granting VAT refunds is used in Pakistan (Harrison and Krelove, 2005) and the automatic refund system is applied in South Africa, Mauritius, Namibia and Rwanda (ATAF 2019).

The TADAT Field Guide 2019 emphasizes the importance of promptly paying legitimate tax refunds while implementing measures to prevent fraud, as a crucial aspect of efficient revenue management. It highlights good practices for managing the administration of VAT refunds:

- Requiring proof of identity checks for VAT registration to prevent fictitious traders from accessing the VAT system.
- Use of specialized software to evaluate all VAT refund claims based on risk factors, to differentiate between claimants with good compliance records and those with poor or unknown records. Higher-risk claims will undergo pre-refund audits or other verification, while lower-risk claims may be verified after the refund is issued.
- Legitimate VAT refunds are paid or offset against other tax liabilities within a defined period (for example, 30 days from the date the refund claim is submitted), and interest is paid to taxpayers when legitimate refunds are not processed in a timely manner.
- Implementing forecasting and monitoring systems to predict levels of VAT refunds and ensure that adequate funds are available to pay all valid refund claims as they arise.

5.5. Compliance, monitoring and enforcement

The tax administration is tasked with ensuring that taxpayers are complying with the VAT rules and regulations, including registering for VAT, issuing correct invoices, submitting accurate VAT returns and paying the VAT due. Thus, it is pertinent for the tax administration to have effective enforcement measures in place to ensure compliance among taxpayers. This can include regular audits, penalties for non-compliance and information-sharing between tax administrations and other relevant agencies.

The ISORA 2018 survey provides some insight into the compliance activities by tax administrations. It states that tax administrations dedicate approximately 42 per cent of staff to compliance enforcement activities. Of these activities, the rate of comprehensive and desk audits in low-income countries is increasing, while issue-oriented audits are decreasing. This is different for high-income countries, where issue-oriented and desk audit percentages are increasing and the comprehensive audit percentage is decreasing. The survey also found that 70 per cent of participants put a high priority on VAT fraud prevention, which is consistent with the higher level of VAT audit coverage as against income tax. The survey also showed that low-income countries prioritized cooperative compliance and exchange of information, followed by pre-assessment verification and tax compliance by design.

As tax administrations allocate resources to compliance activities, especially to verification and audits, the key question that arises is - how effective are these efforts in deterring non-compliance? A study by Best, Shah and Waseem (2021) on the deterrence value of VAT audit in Pakistan showed that one-third of businesses engage in some tax evasion, underreporting an average of 40 per cent of their true tax liability. However, detection without recovery was shown to have little deterrent effect. Based on these findings, it is recommended that developing countries allocate greater resources to post-audit recovery efforts, which are more effective in strengthening compliance and deterring future evasion.

Also, data is increasingly playing an integral role in improving compliance monitoring and enforcement using the compliance risk framework, especially in an automated environment. Data is used to analyse and gain insight on the compliance behaviour of taxpayers which helps in formulating and deploying the appropriate enforcement mechanism towards non-compliance.

Jurisdictions may also explore the benefits of cooperative compliance in VAT, a strategy that shifts from a punitive approach to a collaborative one between tax administrations and taxpayers. This approach offers benefits like faster query responses, reduced legal disputes and fewer audits, leading to lower administrative and compliance costs and enhanced legal certainty. However, concerns exist about its long-term effectiveness, as it might reduce corporations' compliance and increase their workload. Research also indicates that while improved relationships between tax administrations and corporations enhance corporate income tax compliance, they do not significantly impact VAT compliance.[42]

5.6. Dispute resolution

The dispute resolution process can take place at both the administrative and judicial levels and can include a variety of methods such as negotiation, mediation, arbitration and litigation. At the administrative level, taxpayers can raise objections and appeals to tax assessments, while at the judicial level, they can take their disputes to court.

42 Maarten A. Siglé and others, "The cooperative approach to corporate tax compliance: An empirical assessment", *Journal of International Accounting, Auditing and Taxation,* vol. 46, No. 100447 (March 2022).

Effective dispute resolution in taxation can help ensure that tax laws are applied consistently and fairly. It can also help improve taxpayer compliance by providing a clear and efficient process for resolving disputes. This helps in creating a sense of trust between taxpayers and tax administrations, which in turn can lead to increased voluntary compliance.

The dispute resolution process should be impartial and autonomous, easily accessible to taxpayers and proficient in settling disputed issues expeditiously (IMF TADAT, 2019).

Beyond domestic dispute resolution, the complexities of globalization have significantly impacted the VAT domain. The intensification of globalization has increased cross-border VAT issues, which could raise the possibility of double taxation or non-taxation. This situation points out the importance of enhanced international collaboration to efficiently handle cross-border VAT issues and prevent a negative impact on international trade.

5.7. Small and medium enterprises

VAT compliance and administration can be a complex and burdensome for SMEs. These businesses often have limited resources and expertise to navigate the VAT system and may face difficulties in complying with VAT regulations and filing VAT returns. VAT simplification is a key component in making tax compliance less burdensome for these businesses. This can be achieved by implementing measures such as simplifying VAT registration and compliance procedures, reducing the frequency of VAT returns, and providing more accessible and user-friendly guidance on VAT compliance. Additionally, providing SMEs with the option to use simplified VAT accounting systems or flat-rate schemes can also help to reduce compliance costs. In many countries, establishing a VAT registration threshold also plays a key role in reducing administrative burdens by excluding very small businesses from mandatory registration.[43] These measures can have a significant impact on reducing the administrative burden of VAT compliance for SMEs, making it easier for them to comply with their VAT obligations and allowing them to focus on growing their businesses.

5.8. Specific sectors

Certain sectors may present unique administrative and compliance challenges for the tax administration. For example, in the construction industry, the supply of goods and services between multiple contractors and subcontractors along the supply chain can get difficult with the widespread use of irregular payment practices. This includes progress payments made at different stages of a project and retention payments, where part of the payment is withheld until the work is completed. The tourism and hospitality industry may also present specific VAT compliance challenges, particularly when it comes to the application of VAT to accommodation and related services. The treatment of financial services can also be a source of challenges as some financial services may be exempt or out of scope from VAT while others

43 For a detailed discussion, see *The Value Added Tax Treatment of Small Enterprises.*

are not. Donor-funded projects and non-governmental organizations (NGOs) are sectors that may also present risks for VAT administration. Although these entities may be eligible for VAT exemptions or reduced rates, there is a risk that such concessions may be misused, for example, through improper claims or the diversion of exempt goods and services for non-qualifying purposes.

5.9. New technologies

Technology can play a significant role in helping tax administrations in developing countries improve VAT compliance. There is potential for new technologies, such as blockchain and integrated tax administration systems, to improve VAT compliance and administration. One way technology can assist is by automating VAT returns through software solutions, reducing the administrative burden on taxpayers and increasing compliance. This also facilitates compliance monitoring, as processing of returns can be automated with risk indicators built into the system for compliance risk assessment, which can also enhance refund processing. Another way is through implementing electronic invoicing systems, which can improve the accuracy and completeness of VAT records and make it easier for taxpayers to comply with VAT requirements while enabling the tax administration to monitor VAT compliance and providing early warning of potential non-compliance. Furthermore, by using data analytics, tax administrations can identify patterns and trends in VAT compliance and non-compliance, helping them focus their compliance efforts where they are most needed. Technology also facilitates internal and external integration of systems for the exchange of information. However, there are also challenges associated with the adoption of new technologies, including the need for investment and training, as well as concerns about data privacy and cybersecurity.[44]

6. Conclusion

The strength of the VAT is collecting substantial tax revenues at low economic costs. However, to utilize this strength, many developing countries require guidance on the general design and administration of the VAT. Understanding how it works, its basic design elements, its potential regressive nature and the key elements of administering the VAT, as discussed in this paper, allows for in-depth discussions on specific issues that are especially important within the context of developing countries.

These specific issues are discussed in the remainder of this series of papers and includes:

— *The value added tax/goods and services tax treatment of small enterprises:*

This paper discusses the different policy options to treat small enterprises under the VAT. It further discusses the implementation of a registration threshold, which is the most common option used by countries to keep small enterprises out of the VAT system. The paper also discusses

44 See *The Use of New Technologies to Improve Value Added Tax Compliance paper* (United Nations publication).

how technology can assist small enterprises and tax administrations with VAT collection.

— *An introduction to value added tax/goods and services tax refunds:*

This paper provides an overview of the various considerations to be taken into account when administering a VAT throughout the value chain. These considerations relate to registration, VAT filing/payment/refund claims, VAT enforcement, debt collection and deregistration. It discusses various options available to tax administrations to effect payment of timely refunds.

— *The use of new technologies to improve value added tax compliance:*

This paper gives an overview of the different technological innovation options that may improve VAT compliance. It explores options that improve the tracking of VAT data, taxpayer services and tax fulfillment to ease voluntary compliance and enhance tax data analysis.

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Paper II. The value added tax/ goods and services tax treatment of small enterprises

1. Introduction

Being a multiple-stage general tax on consumption, value added tax (hereinafter referred to as VAT) should, by design, be collected on all transactions in the supply chain. A very broad application of the VAT system is paramount to maximize the revenue-generating capacity of the tax, in particular, in countries where most economic actors are small enterprises. VAT compliance for small enterprises and the administration of these enterprises for the tax administration[45] is, however, a complex and challenging task. These enterprises indeed often have limited resources and expertise with which to navigate the VAT system and may face difficulties in complying with VAT laws and regulations and filing VAT returns. In this paper, we will discuss the different policy options that have been implemented by countries to treat small enterprises under the VAT system.

The most common option used by countries for small enterprises is to keep them out of the VAT system by implementing a registration threshold (see section 2.1.1).

Because small enterprises may constitute a significant share of the economy of a country, other countries prefer to include as many of them into the VAT system and offer VAT simplification measures to make tax compliance less burdensome. This can be achieved through measures such as simplified VAT registration and compliance procedures, reduced frequency of VAT returns, and the provision of accessible and user-friendly guidance on VAT compliance (see section 2.2.). As discussed in section 2.2., these simplification measures can apply in countries where there is no registration threshold (which means that any supplier is included into the VAT system irrespective of their turnover) or in countries that have implemented a low registration threshold.

Finally, providing small enterprises with the option to use simplified schemes for VAT and other taxes (also so called, flat-rate or fixed amount of tax schemes) can help to reduce compliance costs. These measures can have a significant impact on reducing the VAT compliance burden for small enterprises, making it easier for them to comply with their VAT obligations and allowing them to focus on growing their

45 The term "tax administration" refers to the institution authorized to manage VAT. In this paper as well as subsequent papers, the term may also be used interchangeably with "tax authority" or "revenue authority" as well as "revenue administration".

enterprises (simplified schemes, flat-rate or fixed amount of tax schemes are discussed in section 2.3.).[46]

With the assistance of technology, another option is the possibility that small enterprises are included in the VAT system from the start of their economic activities, as it is in Chile. Section 3 focuses on technology tools that can be used to reduce compliance and administration costs and to improve the enforcement of the VATs (e.g., cash registers).

For the purpose of this report, the term 'small enterprise'[47] shall cover any VAT taxpayer to whom a country might consider applying special VAT rules in view of its small/medium size and/or low/medium turnover. This may include both corporate/non-corporate entities and individuals that engage in a business activity. It is recommended that countries issue guidelines with regards to when an entity or an individual is considered a small enterprise.

2. Policy options

2.1. Small enterprise exemption

In this section, we will discuss the options for exempting small enterprises to keep them out of the VAT system by implementing a registration threshold. We will discuss issues related to the setting of thresholds, voluntary registration, sector-specific thresholds, gradual tax relief through multiple thresholds and evasion relating to thresholds.

2.1.1. Registration threshold

An essential policy choice in the design of a VAT is the threshold above which businesses must register for VAT. A registration threshold is usually the primary policy instrument for keeping small enterprises outside of the VAT system.

The appropriate registration threshold for a particular country will depend on a number of factors, which may be of different levels of importance for different economies. Considerations should include:

(i) Effect on revenue: the threshold should be set at a level that does not adversely impact the country's revenue-raising ability.

(ii) Ensuring administrative efficiency: the threshold should enable tax administrators to focus on enterprises that contribute the greatest share of VAT revenues, which, in some countries, also require excluding small-scale farmers from the VAT net.

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46 More detailed information about the Latin American regimes for small enterprises can be found at Darío González, *Special Taxation Regimes for Taxpayers with Lower Capacity: Theory and Strategies in Tax Policy and Administration in Latin America* (Panama City, Inter-American Center for Tax Administrations, 2024).

47 The authors attempted to include a definition of small enterprises, but they realized that depending on what that definition is used for, the parameters to consider may be different.

(iii) The distribution of compliance costs: the threshold should exempt small businesses to limit the regressivity of VAT compliance costs.

(iv) Avoiding economic losses: the threshold should be set at a level where marginal administrative and compliance costs do not exceed marginal revenues.

2.1.1.1. Effect on revenue

To collect sufficient revenues under the VAT, the threshold cannot be too high. Some countries, such as Armenia, Madagascar and Singapore, have a threshold exceeding US$300,000. Such a high threshold exempts most businesses from VAT and, compared to a benchmark VAT threshold, is often a VAT expenditure.[48] Further, such a high threshold generally gives rise to competitive distortions between persons below and above the registration threshold. It also results in over-reliance on the tax instrument applied to persons below the registration threshold, which is generally a turnover or presumptive tax. Although simplified taxes, such as the turnover tax, reduce compliance costs, they give rise to tax cascading and significant economic distortions.

2.1.1.2. Administrative efficiency

To allow tax administrators to focus on large businesses, the threshold should not be too low. Some countries adopt a low or even no registration threshold. As a general rule of thumb, 90 per cent of VAT revenues is collected from 10 per cent of VAT-registered persons. Lowering the threshold to an inappropriately low level is an inefficient policy to obtain additional tax revenues or reduce informality. Broadening the base of the VAT by removing exempt or zero-rated supplies will generally provide greater additional revenues.

Many countries apply special regimes to farmers under the VAT. Farmers are often in remote locations, may not have accurate accounting records and represent some of the poorest individuals in developing countries. Including small-scale farmers under the VAT may therefore give rise to high administrative and compliance costs. To avoid these consequences, the VAT threshold should be high enough to exclude small-scale farmers from the VAT.[49]

2.1.1.3. Distribution of compliance costs

VAT compliance costs are regressive since, as a proportion of turnover, they decrease with business size. If the registration threshold is too low, small businesses will be required to register and comply with the VAT. Since these businesses may not have

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48 A benchmark VAT threshold can be estimated by relying on the model proposed by Michael Keen & Jack M. Mintz, "The optimal threshold for a value-added tax", *Journal of Public Economics,* vol. 88 (3-4) (March, 2004), pp. 559–576, but excluding compliance costs.

49 Excluding small-scale farmers from the VAT may reduce the regressivity of the VAT, but this would depend, among others, on the extent of informality in a country, the extent that foodstuffs are imported and how capital inputs are treated under the VAT.

accurate or complete accounting records, their cost of compliance may be substantial. An appropriate threshold will reduce the regressivity of VAT compliance costs by not requiring small enterprises to comply with the tax.[50]

2.1.1.4. Avoiding economic losses

Economists approach the setting of a VAT threshold by estimating the optimal threshold for a VAT, taking into consideration the characteristics of the country under study.[51] This optimal threshold is determined to avoid economic losses, which will generally be avoided if the compliance and administrative costs from having one more person registered is equal to or less than the additional revenues that will be collected from this person.[52]

Although determining actual compliance costs is difficult and economists generally rely on approximated compliance costs, knowing the optimal threshold for a country is useful since collecting tax revenues should be, as far as possible, to the economic benefit of a country. Thinking in terms of the cost-benefits of the registration threshold is useful to inform us what an appropriate threshold level may be.

Once a threshold that approximates an optimal threshold is established, economists revise the threshold to take into consideration economic changes. Especially in high-inflation environments, the registration threshold may need to be raised regularly since without these adjustments, the threshold in real terms decreases over time. To have some indication of changes in administrative and compliance costs, economists sometimes consider the change in gross domestic product (GDP) per capita over time. GDP per capita is viewed as a proxy for administrative and compliance costs, since these are correlated with the level of development of a country. An increase in per capita GDP suggests a decrease in the sum of administrative and compliance costs, which will, in terms of an optimal threshold, be reflected by lowering the threshold.

The table below provides average registration thresholds by region, applicable at the start of 2020.[53] The average threshold generally exceeds US$50,000 and is higher in less developed regions with lower per capita GDP than more developed regions.

2.1.2. Value added tax registration

Generally, businesses are required to register for VAT if their turnover exceeds the registration threshold over a period, which is generally 12 months. Each country has its own approach to establishing turnover, with a common approach being that turnover refers to the value of all sales, whether taxable supplies or not. Some countries do not use turnover, but rather, taxable supplies to determine whether a business should

50 Other policy options, such as simplified schemes and presumptive taxes applied to small businesses, limit the regressivity of compliance costs for other taxes.

51 Keen & Mintz, "The optimal threshold for a value-added tax", pp. 559–576.

52 To be precise, it is the social value of the additional revenues and administrative costs that should be considered in determining the optimal threshold.

53 Data obtained from www.imf.org and includes data for 128 countries.

register for VAT. Businesses only making exempt supplies would, therefore, not be required to register for VAT or submit VAT returns. This approach has the benefit of reducing administrative and compliance costs. However, since businesses that make exempt supplies would therefore not file returns, VAT return data cannot be used for policy analysis. Policy analysis should therefore be conducted using other sources of data and more advanced methods.

Average VAT registration threshold by region

Region	Average threshold (US$)
Australasia	45 120
Baltic States	184 811
Caribbean	66 918
Central America	37 500
Central Asia	102 865
Eastern Africa	68 478
Eastern Asia	93 292
Eastern Europe	48 897
Melanesia	57 385
Middle Africa	493 206
Middle East	97 988
Northern Africa	69 427
Northern America	22 263
Northern Europe	93 811
Polynesia	72 476
South America	36 425
South-Eastern Asia	190 949
Southern Africa	57 518
Southern Asia	91 956
Southern Europe	15 782
Western Africa	325 325
Western Asia	127 582
Western Europe	50 428

To reduce administrative and compliance costs, rules are required to keep businesses that temporarily exceed the threshold from registering. Common rules would exclude once-off transactions of large value from consideration when determining whether a business should register. Other rules allow businesses to provide reasons that their turnover will only temporarily exceed the threshold.

2.1.3. Voluntary registration

The registration threshold only determines when businesses must register for VAT. If appropriately designed, it does not exempt all businesses below the threshold from VAT. Businesses should be able to select to not be exempt, but rather opt to be VAT-registered even if their turnover is below the registration threshold. If not, the registration threshold will give rise to greater competitive distortions and increase informality.

Businesses will generally opt to voluntarily register under the VAT if they predominantly supply to other VAT-registered businesses or make zero-rated supplies. Registration allows input VAT to be deducted by the small business and the output VAT charged will be deductible by registered recipients. Registering for VAT then results in a competitive advantage for businesses predominantly supplying to registered businesses. For zero-rated supplies, including exports, businesses do not charge output VAT but would prefer to be registered to deduct input VAT. Another reason that businesses may opt to register is if they have large capital costs and experience cash flow constraints. Cash flow constraints may force businesses to register even when it may give rise to a competitive disadvantage to do so.

A well-designed VAT system therefore provides incentives to register and enter the formal tax system, which may reduce informality and raise tax collections from other tax instruments, such as the income tax. Since these incentives relate to claiming input VAT, the broader the base of the VAT, the stronger these incentives. Applying the VAT to capital inputs and common business inputs such as fuels, water and electricity, is particularly important to motivate voluntary VAT registration, as businesses once registered would be allowed to deduct VAT on these items. Taxing these supplies will not only raise additional VAT revenues because of a broader base but also raise revenues from other tax instruments because of more businesses being in the formal tax system.

Although voluntary registrations should be allowed, tax administrations should determine the legitimacy of a business before registering it for VAT, considering that VAT registration is the entry point to VAT fraud. VAT provides unique opportunities for fraud, especially VAT refund fraud, which may be prevalent and difficult to detect.

To limit VAT fraud, some countries such as South Africa, apply a low, voluntary registration threshold below which most businesses may not register. Other countries rely on other requirements that a business needs to meet to show that it is legitimate, such as business licenses and physical presence in the case of Mauritius, and third-party data in the case of Ukraine. Irrespective of the approach adopted, objective requirements to establish the legitimacy of a business are required prior to VAT registration.

2.1.4. Sector-specific thresholds

Since the value-added of a transaction varies by sector, and certain sectors such as agriculture and forestry face higher compliance costs[54] while others, such as professional services, can easily evade the VAT,[55] some countries set sector-specific thresholds. These may also take the form of requiring businesses of a certain legal form to register for VAT irrespective of their turnover, which is effectively a threshold of zero. Separate thresholds for suppliers of goods and suppliers of services are also found in, for instance, Senegal, Côte d'Ivoire, Ireland, France, Algeria and Malta.

Although setting sector-specific or supply-specific thresholds may appear appropriate when only considering tax policy, this approach results in significant administrative challenges. The primary challenge is classification. Determining the sector that a person operates in, or whether a person only made supplies of goods or services, poses a challenge to tax administrators. Without sufficient administrative capacity, businesses can often evade tax registration by arguing or presenting themselves belonging to a different sector. If businesses are not classified to the sector that they appropriately belong, competitive distortions will arise.

When deciding on a threshold for foreign suppliers that supply electronic services or low-value imported goods, the threshold applicable to domestic businesses will generally be appropriate. Although the ratio of compliance costs to turnover of foreign businesses may, on average, be less than domestic businesses, this approach avoids competitive distortions between domestic and foreign businesses. That said, where there is little domestic competition with foreign suppliers, or different registration, administration or compliance processes are applied to foreign suppliers, a separate registration threshold for foreign suppliers may be appropriate.

As a general principle of VAT, whether the tax is charged should, as far as possible, be determined by easily verifiable factors alone. It is for this reason that, as often done in developing countries, basing the tax treatment on the use of goods or services, or the nature of the recipient is considered poor policy. Similarly, the difficulty verifying the sector that a business belongs to may give rise to costs that exceed the benefits of sector-specific thresholds. Generally, a single registration threshold that applies to all persons, irrespective of sector or type of supplies made, is considered best practice under a VAT.

2.1.5. Gradual tax relief by multiple thresholds

Another reason why countries may have more than one compulsory registration threshold is to ease businesses into the VAT, or provide gradual tax relief, by providing reduced rates on the supplies by persons below the primary threshold, but above a secondary threshold. Persons with turnover between the two thresholds will charge

54 The compliance costs in these sectors tend to be higher due to operating in remote locations and, in many developing countries, comprising many smaller businesses.

55 Professional services in developing countries are often cash-based businesses with turnovers or taxable supplies that exceed the registration threshold. Operating in cash eases VAT evasion.

output VAT at a reduced rate and can deduct input VAT at the rate paid on their purchases, or the rate applied to their supplies.

This practice gives rise to some negative consequences. The primary consequence is the challenges that arise in applying a VAT with multiple rates. Multiple rates raise the compliance and administrative costs of the VAT since they require increased verification to ensure that the correct rate is/was charged. Multiple rates also increase the likelihood that VAT refunds will arise and, especially in developing countries, find VAT refunds difficult to administer.

Another consequence is that competitive distortions arise between persons charging the reduced VAT rate and those above the primary or general registration threshold, who must charge the standard rate. These distortions will be greater if the businesses charging the reduced VAT rate are allowed to deduct input VAT at the rate paid on their purchases. If input VAT deductions are reduced by limiting them to the rate charged on supplies, this also raises administrative and compliance costs and leads to tax cascading.

Reduced rates for small businesses also distort consumer choices. Since the VAT treatment is inconsistent between different suppliers, similar goods and services will be taxed at different rates, depending on the supplier. Since this results in economic distortions, the overall efficiency of the VAT is reduced. These consequences suggest that gradual tax relief by multiple thresholds should generally be avoided under the VAT.

2.1.6. Registration evasion

Persons evading VAT registration provide an administrative challenge. In particular, businesses that predominantly supply to final consumers will have incentives to avoid or evade VAT registration, particularly if they do not have significant input VAT deductions (for example, service providers whose main inputs are labour). Since final consumers cannot deduct input VAT on their purchases, non-registered suppliers to consumers will generally have a competitive advantage over registered suppliers.

There are two prominent methods of evading VAT registration if a single registration threshold is applied. The first is under-reporting of turnover to remain below the threshold. Liu et al., (2019) show that businesses with less inputs, who face greater competition, and predominantly sell to consumers tend to under-report turnover to remain below the registration threshold.[56] Although this type of evasion can be difficult to detect, identifying businesses that persistently have turnover below the threshold to be audited is an important first step. Cross-checking VAT return data with other data available to the revenue authority may detect under-reporting. If the threshold is changed, this also presents an opportunity to identify persons whose reported turnover follows the threshold to further investigate the reasons for the observed change in turnover.

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56 Li Liu, and others, "VAT notches, voluntary registration, and bunching: Theory and UK evidence", *The Review of Economics and Statistics,* vol.103, No.1(March, 2021), pp. 151–164.

The other method of evading the threshold involves splitting businesses into branches, so that each has turnover below the threshold with the purpose of avoiding VAT registration.[57] As a business's turnover approaches the threshold, persons will attempt to evade the threshold by creating a second business, often in proximity to the first. To limit this form of evasion, anti-avoidance rules that do not allow the calculation of the threshold on a branch-by-branch basis or deem multiple businesses to be a single person for VAT purposes are required. Administrators may consider the financial, economic and organizational links of a business to identify splitting of businesses. Further, only providing business licenses to individuals, and not businesses, may help detect this form of evasion since multiple businesses can be linked to the individual.

Where businesses evaded the threshold or did not register when they ought to, rules are required to determine the VAT liability of these businesses. Some countries deem such businesses to have been registered for VAT from the date registration was due. Businesses are then required to re-invoice all supplies from the date registration was due and declare the VAT over to the tax administration. Other countries may make a deemed assessment of the VAT payable. Penalties are also common.

While determining appropriate rules to limit evasion, not overburdening businesses with excessive documentary and other requirements is important. A balance between limiting threshold-related evasion and limiting compliance costs and other disincentives towards registration is required. VAT registration regulations should be kept as simple as possible, while limiting legal uncertainty. In more developed countries, requiring electronic invoicing may provide further robustness to tax administration.

2.2. Administrative simplifications for small enterprises within the value added tax system

In this section, we will discuss policy options that may improve compliance, reduce compliance costs or simplify the standard VAT regime for small enterprises that are registered.

Simplification measures may apply in countries where there is no exemption from VAT for small enterprises (the exemption for small enterprises or "registration threshold" discussed in section 2.1). Simplifications may also apply in countries where there is a registration threshold. In the latter case, the simplifications are targeted for enterprises that are below the registration threshold but opt for voluntary registration,[58] as well as for enterprises having a turnover exceeding the registration threshold, but are still considered as being small enterprises that should benefit from simplifications. In this case, a second threshold must be set to determine which small enterprises may benefit from simplifications.

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57 This method is not illegal in all countries and may, in such cases, constitute tax avoidance.

58 Being VAT-registered enables the taxpayer to recover their input VAT. This is a great incentive to convince small enterprises to enter the VAT system.

Example: If the exemption threshold is set at US$10,000 (annual turnover), simplifications could apply to small enterprises whose annual turnover ranges between US$10,000 and US$100,000.

2.2.1. Simplifying value added tax obligations

2.2.1.1. Registration process

Registration is a crucial step because this is the moment when taxpayers are "entering" the VAT system.

It is undisputed that tax administrations need to collect and verify data regarding the taxpayers before they can validate a registration. Nevertheless, registration should not become an unnecessarily cumbersome process. If the burden associated with registration is too high, this may indeed jeopardize the whole process. In contrast, it is widely acknowledged that simple registration procedures increase the level of compliance to the registration requirement.

Overly complex registration procedures may also lead to errors. If these errors lead to sanctions for the taxpayers, it may also cause frustration and distrust in the tax system and administration.

Accordingly, the right balance should be struck between what the tax administration needs to monitor in the functioning of the system to avoid abuse and fraud and what small enterprises may legitimately be expected to provide. The practicalities of the registration process (online versus offline options) are also of utmost importance.

It is therefore recommended to limit the requested information to what is necessary to clearly identify the small business and to ensure the collection of the VAT. This should be limited to:

- The full name and date of birth of the natural person and the national identification card number (if applicable. Not applicable if legal entity).
- The name of the legal entity and full name and date of birth of the natural person legally representing the legal entity (if applicable. Not applicable if natural person).
- Postal and registration address, and name and contact details (email address and telephone number) of a contact person for the tax administration as well as all relevant tax reference numbers of the owners/shareholders.
- Website of the business entity (if applicable).
- The sector in which the business activities fall e.g., agriculture, construction etc.
- Date of commencement of activity.
- The date that it is liable to register for VAT.
- Bank account details.
- Any reference number with another regulated authority (if applicable).

- Turnover during three previous years (if applicable. Not applicable for new businesses).
- The value of expected sales to be made in a predetermined period e.g., 12 months from date of registration, alternatively the value of sales made in a prior period that requires a VAT registration.
- Expected percentage of exempt activities (if applicable).
- Expected application of reduced VAT rates (yes or no and which ones).

Both online and offline options should be considered for the actual submission of the registration request. In practice, an online form on the tax administration website and paper forms sent by mail or email or submitted directly at a tax office, should all be acceptable forms of registration.

Some countries require the appointment of a fiscal representative for taxpayers as a prerequisite for registration, particularly foreign taxpayers, to register. This adds a layer of costs, complexity and administrative burden. Moreover, in many cases, it is almost impossible to find a person or company willing to act as a representative due to joint and several liability risks for that person or company. The requirement to have a fiscal representative may also be counterproductive as, while it does not help addressing the situation of those that avoid registering, it provides a disincentive to them registering in future.

2.2.1.2 Tax returns

The tax return is typically structured in two main parts:

- VAT collected by the taxpayer (output VAT)
- VAT incurred by the taxpayer (input VAT)

Further breakdowns are required to enable the tax administrations to understand how the taxpayer calculated these respective amounts and to reconcile the numbers. However, it is once again recommended to keep the number of boxes to a minimum, in particular for small enterprises, in order to facilitate and therefore increase compliance. Explaining why each piece of information is necessary, for example in the form of guidelines published on the tax administration website, may also increase acceptance and compliance by the taxpayer.

In order to monitor the correct application of the VAT, the information that must be reported to the tax administration can be limited to the following:

- Total amount of output VAT collected during the taxable period.
- Total amount of deductible input VAT incurred during the taxable period.
- Turnover related to supplies in which the taxpayer applied reduced VAT rates (and which ones) during the taxable period.[59]

59 This information is necessary to understand how the total amount of output VAT was reached.

- Turnover related to supplies in which the taxpayer applied exemptions (without a right to deduct) during the taxable period.[60]
- Turnover related to exports or other supplies subject to a zero-rate made during the taxable period.[61]
- Expenditure related to supplies in which the customer was liable to self-assess the VAT (domestic reverse charge) during the taxable period.[62]
- Turnover related to supplies treated as domestic supplies in a foreign country during the taxable period, in relation to which a right to deduct is exercised.[63]
- Amount of adjustment notes issued during the taxable period.[64]
- Amount of adjustment notes received during the taxable period.[65]
- Amount of VAT deduction adjustment in favour of the treasury.[66]
- Amount of VAT deduction adjustment in favour of the taxpayer.[67]

It is further recommended to:

- Allow taxpayers to submit paper and electronic tax returns.
- Allow for the possibility not only to submit returns online but also to fill in online returns (in an electronic format).

2.2.1.3. Invoices

The obligation to issue tax invoices in business-to-business (B2B) transactions is linked to the monitoring of the VAT deductions made by the taxpayers throughout the supply chain. Taxpayers usually need tax invoices to support their deduction claims. Tax invoices should therefore include the information necessary to determine whether the right to deduct was legally exercised. At the same time, the invoicing process should remain simple.

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60 This information is necessary because when such supplies are made, the taxpayer does not have a full right to deduct.

61 This information is necessary because in this case there is no related output VAT, but the taxpayer probably incurred expenses (with input VAT) for which they will require a deduction. In the absence of information regarding these supplies, the amount of input VAT may seem disproportionate as compared to the amount of input VAT.

62 See preceding footnote.

63 Id.

64 This information is important because in this case, a reduction of the output VAT is made by the taxpayer.

65 This information is important because in this case, the taxpayer is required to adjust the input VAT deducted in relation to this amount (if VAT was applied on the supply).

66 See preceding footnote.

67 This information is necessary to monitor adjustments made by the taxable person (in case of credit notes received or other corrections to the right to deduct).

To reach this objective, it is recommended to require only the following information on tax invoices issued by small enterprises:

- A serial number.[68]
- A date of issuance.[69]
- The name and VAT number of the supplier.[70]
- The name and VAT number of the customer.[71]
- The date of the supply.[72]
- The nature of the supply (description should be detailed enough and include location, if relevant).[73]
- The net price, VAT rate applicable, VAT due and price including VAT.[74]
- If applicable, the legal provision according to which the liability to pay the VAT is switched to the customer (domestic reverse charge).[75]

It is also recommended to:

- Allow both paper and digital invoices (for digital invoices, both PDF and XML formats should be accepted).
- Provide a template on the tax administration website.

2.2.1.4. Record-keeping

Taxpayers must keep records of their transactions for audit purposes. If the tax limitation period applicable is long, this implies that taxpayers will have to keep records of their transactions for a long time. This may be complex to achieve for small enterprises that may have difficulties in storing and protecting their records. In order to minimize the financial burden related to record-keeping obligations, it is therefore recommended to adopt a reasonably long time period during which records should be kept. A shorter period could also be adopted for small enterprises for whom the costs of keeping data are proportionately greater than for larger enterprises.

In order to encourage compliance, a standard record-keeping obligation could also be set that is prolonged in case of non-compliance. Mexico, for example, applies

68 This is needed to clearly identify each invoice and make the invoice a unique document.

69 This may be needed to determine the time when the VAT is due to the treasury.

70 This is needed because only supplies made by taxable persons are, in principle, subject to (deductible) VAT.

71 This is needed to identify the person who will be allowed to deduct the VAT included on the invoice. In a cross-border situation, the name and VAT number of the customer are needed to determine whether VAT is due in the jurisdiction of the supplier.

72 This is needed to determine the time when the VAT is due to the treasury.

73 This is needed to confirm that the correct rate was applied on the invoice and whether VAT is due in the jurisdiction of the supplier.

74 This is needed to confirm that the calculation is made correctly. In case of application of a reduced rate, some additional information may be required.

75 This is needed to explain why in this case no VAT is included on the invoice.

a record-keeping obligation of five years for all businesses, which is increased for non-compliant businesses for up to 10 years.

2.2.1.5. Payment of the value added tax

Cash and electronic payments should be allowed.

2.2.2. Adjusted deadlines and procedures

2.2.2.1. Taxable periods

Under the VAT system, taxpayers are collecting the tax and passing it on to the tax administration on a periodic basis. The longer the tax period, the higher the risk that the taxpayer will collect the VAT but might not remit it to the tax administration. At the same time, requiring taxpayers to remit VAT at very short intervals is overly burdensome.

In the case of small enterprises in particular, a balance must be struck between the risk of revenue loss (which is smaller than in the case of larger businesses) and the associated compliance burden.

It is therefore recommended to adopt longer taxable periods for small enterprises than for other businesses, e.g., quarterly, if the standard taxable period is monthly. Specific taxable periods may also be applicable to some sectors, e.g., the agricultural or the tourism sectors, in order to keep pace with the revenue cycles of small enterprises active in this sector.

2.2.2.2. Refunds

When a taxpayer collects less output tax than its deductible input tax, it suffers a VAT burden that can only be relieved if the situation is not repeated in the next period (i.e., if, in the next period the taxpayer is able to deduct all the input VAT incurred against the output VAT collected) or if a refund of input VAT is offered.

Usually, countries do not pay refunds that are under a certain amount (refund thresholds) for tax administrative efficiency reasons (because processing the refund is costly for the tax administration). Yet, these small amounts can be important for small enterprises where cash flow is typically lower.

Also, some small enterprises may also always be in a credit position, for example, because they incur VAT in their jurisdiction for the purpose of transactions that will take place abroad or in relation to exports (and for which no output VAT can be collected in their jurisdiction). For these taxpayers, the refunds payable is likely to exceed the refund thresholds, but the refund process may take some time because the refund request is usually made via the VAT return, and the tax period is likely to be longer for small enterprises (see section 2.2.2.1).

To address this situation, it is possible:

— To apply reduced refund thresholds for small enterprises (keeping the related administrative burden in mind).

— To organize separate refund procedures for small enterprises that sell abroad on a recurrent basis (a threshold based on the turnover related to sales abroad should be set).

— To allow regular exporters, e.g., taxpayers whose turnover deriving from exports is at least a certain percentage (e.g., 10 per cent) of their annual turnover, to purchase goods/services without VAT.

2.2.2.3. Time of payment — Cash accounting

2.2.2.3.1. Concept

Cash accounting concerns the time when the taxpayer is required to pay the VAT to the treasury. Under general rules, the taxpayer will usually be required to pay the VAT at the end of the taxable period during which the supply subject to VAT was made or invoiced. However, it is not because the supply was made or invoiced that the VAT was already paid to the supplier by the customer.

Under the cash accounting method, the time when the VAT must be paid to the treasury is calculated, not taking into consideration the time of the supply or of the invoice, but taking into consideration the moment when the customer pays the VAT to the supplier. With this method, taxpayers do not have to pre-finance the VAT.

If the right for the customer to deduct the input VAT arises at the time the VAT becomes due to the treasury, the cash accounting method prevents a situation where the customer would already benefit from a possibility to deduct a VAT that it has not yet paid (based on the invoice issued by the supplier that it has not yet paid).

2.2.2.3.2. Applicability to small enterprises

Under the general rules, taxpayers may have to pre-finance the VAT and wait until the customer pays for it. For larger businesses, the cash flow disadvantage related to these rules is usually considered bearable. For small enterprises, in contrast, it may be very problematic.

This is why the reliance on the cash accounting method is recommended for small businesses, particularly in countries where there is no registration threshold. In countries where there is a registration threshold, cash accounting could still be applied to small enterprises below a (second) threshold to be determined.

2.3. Simplified scheme for value added tax (Flat-rate or fixed amount of tax schemes)

In this section, we will describe the simplified scheme for VAT and/or other taxes, or the so-called flat-rate, fixed amount or special schemes, used in some jurisdictions for small enterprises, and discuss the advantages and disadvantages of such special schemes that are meant to be alternatives to the VAT system for small enterprises. These systems are therefore different from those described in sections 2.1 and 2.2. and may also cover other taxes and contributions.

These simplified schemes involve taxpayers paying a fixed amount of tax, a flat-rate or a tax amount that is based on a factor as explained below, in a taxable period

(usually monthly, but it can be quarterly or annually). These simplified schemes cover, in general, not only VAT but also income tax and, in some jurisdictions, other taxes or contributions, such as social security contributions or health insurance. Special schemes were introduced in some Latin American countries at the end of the 1990s. In the European Union, Spain and Italy have also introduced a special scheme for small enterprises, and outside of the European Union, Belarus and Ukraine, among other countries, have done the same.

It is important to mention that the main objective of these types of special schemes is not only to collect taxes, but to lower compliance and administrative costs, and to solve the problem of informality for these small enterprises.

2.3.1. Scope

These special schemes apply, in general, to individuals and small enterprises that perform certain economic activities and meet certain requirements as explained in section 2.3.2.

Each jurisdiction has different criteria to determine who can be covered by the special schemes. In general, the turnover is the main condition to enter into the special schemes, but the type of activity/activities that the small enterprises carry out are usually also considered. In addition to these criteria, the number of activities and establishments where these activities take place is considered (e.g., Argentina, Costa Rica). The number of employees is a determinate factor in some countries (e.g., Belarus). In other countries, the taxpayer's status for income tax purposes has to be considered (e.g., Spain).

2.3.2. Requirements

The special schemes apply to those who meet certain requirements. We included a list of requirements below that countries consider when designing these special schemes.

2.3.2.1. Turnover thresholds

In order to be qualified for the special schemes, the turnover should not be higher than a certain threshold based on gross turnover, covering specific activities or sectors. This means that the main condition to enter the special schemes is to have a turnover under a certain threshold. This threshold needs to be adjusted regularly, mainly to consider inflation.

Jurisdictions apply different thresholds for different types of activities. In Argentina, the maximum thresholds to qualify for special schemes for small enterprises are different for the supply of services than for the supply of goods, as the threshold for supply of services is lower than the threshold for supply of goods. The reason for this difference is that VAT is a general, broadly-based consumption tax assessed on the value added of goods and services, so in order to reach the same added value in a sale of goods, a higher turnover must be achieved. In case the small enterprise performs supplies of goods and services, it needs to take into account its main activity to determine which category of the special scheme it qualifies.

Other examples are: Spain which has a single threshold to be under the special scheme, Peru established two thresholds based on turnover or acquisitions per monthly basis and Ecuador established seven different thresholds based on annual turnover.

2.3.2.2. Activities

Regarding the activities that the special schemes comprise, each jurisdiction has its own limited and restrictive list.

In Uruguay, the list covers around 40 types of activities, for example, sales of handicrafts, and services like maintenance of vehicles, or those rendered by tourist guides, trainers and dog walkers. However, there are also countries that do not use a list of activities to apply for the special scheme, but instead use a list of restricted activities, so if the taxpayer is engaged in any of them, they cannot benefit from the special scheme. For example, Ecuador has a list of this type, where activities such as stockbroker services, or advertising or commercialization and distribution of fuels are excluded from the possibility to be under the relevant special scheme. Another example is Peru, where services rendered by stockbrokers, notaries, travel agencies or passenger transport cannot benefit from the special scheme.

Most jurisdictions do not allow taxpayers who perform cross-border transactions to be included in the special schemes.

2.3.2.3. Number of activities, establishments or employees

Some jurisdictions also limit the number of activities, the number of establishments where these activities can be carried out and the number of employees that these enterprises can have.

In Argentina, taxpayers under the *Monotributo* are not allowed to import goods and may not exercise more than three activities or develop activities in more than three places at the same time. In Costa Rica and Peru, if the small enterprise has more than one establishment open to the public, regardless of the number of activities, it cannot benefit from the special scheme.

In Spain, the special scheme applies to each of the activities carried out by the entrepreneur or professional where the activities must be considered independently. For example, if a small enterprise is registered as performing three activities (e.g., trade in household appliances, trade in building materials, trade of doors, windows and shutters), but only two of those activities are under the scope of the simplified scheme (e.g., trade in household appliances and trade of doors, windows and shutters), the simplified regime applies to each of those two activities carried out by the entrepreneur or professional.

In Belarus, there are several special schemes available for small enterprises:

— The single tax on individual entrepreneurs and other individuals (type of presumptive taxation that is mandatory for certain types of economic activity).

— Individual entrepreneurship, which applies to individuals registered as individual entrepreneurs who are allowed to hire up to three employees that are their first-degree relatives.

— The simplified tax regime (covers VAT and corporate income tax), which does not depend on the nature of the supply but on the following criteria:
  - The average number of employees does not exceed 50 persons.
  - Gross revenue does not exceed the registration threshold during the fiscal year.
  - Companies having subsidiaries on the territory of Belarus cannot benefit from this regime.

2.3.2.4. Who can be a taxpayer?

The special schemes, in general, apply to individuals (natural persons) that perform an economic activity and, in some jurisdictions, also to small enterprises that meet certain requirements.

In Argentina, the special regime is open to individuals, sole proprietorships and undivided estates of natural persons engaged in primary activities (e.g., farming activities), trade in goods and rendering of services (including professional services, but excluding management of companies and board members) with certain thresholds based on annual turnover.

Costa Rica allows individuals and legal entities to register under the special scheme. In Ecuador, only natural persons can be included in the special scheme. In Peru, natural persons and undivided estates of natural persons are included. In Uruguay, both individuals and certain partnerships can benefit from special schemes.

In Spain, the special scheme applies to individuals and enterprises that are considered individual entrepreneurs and pass-through entities for personal income tax purposes (e.g., joint property entities or entities without a legal personality) that pursue certain commercial activities (e.g., restaurant services, repairs, transportation, hairstyling), provided that, in relation to such activities, the enterprise does not exceed the limits established for each of the activities.[76]

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76 In Spain, an activity is under the application of the special scheme (simplified) when it is specifically included in the Ministerial Order regulating the special system. The special scheme is applied to all those who meet the following requirements:
  - They are (i) individuals or (ii) enterprises using the income allocation regime of personal income tax, provided that, in the latter case, all partners, heirs, co-proprietors or stakeholders are individuals.
  - That each of its activities is included in the Order that develops this regime and that the specific magnitudes established there are not exceeded.
  - Their income volume in the previous year does not exceed any of the following amounts (when an activity has been started in the previous year, the volume of revenue is raised for the year):

2.3.3. Taxes covered

The special schemes cover not only VAT, but also other taxes such as income tax and, in some jurisdictions, contributions such as social security or health insurance.

In Argentina, the special scheme called *Monotributo* unifies the tax component (that includes VAT and income tax) with the pension component (that includes retirement contributions and health insurance) in a single monthly instalment. Argentinian legislation also exempts the social security component for the first two lowest categories of taxpayers that do not have other sources of income in addition to the respective commercial activity (such as employment income, pension or rents).

Uruguay covers retirement contributions, while health insurance is optional. In Belarus, Costa Rica and Ukraine, VAT and income tax are included. In Brazil, all indirect taxes are comprised in the *Microempreendedor* individual (MEI). In Brazil, the *Simples Nacional*[77] covers eight indirect taxes (six federal, one estate level and one municipal).

2.3.4. Categories

The categories in the special schemes determine the tax that the taxpayers must pay. This amount could be a fixed amount of tax or an amount of tax that is based on different factors.

In Argentina, the category is assigned according to the following three factors: (1) the type of commercial activity that is carried out (provision of services or the supply of goods); (2) if the activity is carried out in a physical establishment (the square meters of the establishment, the total electrical energy consumed and the rental cost of the establishment); and (3) the gross annual turnover (an estimate of the income obtained from carrying out the activities). Based on these parameters, the *Monotributo* is divided into eleven categories with a fixed amount to be paid monthly.

  - €250,000 for the total of all economic activities, excluding agricultural, forestry or livestock farming activities.
  - €250,000 for the total of all agricultural, forestry and livestock farming activities.
- The volume of acquisitions or imports of goods and services in the previous financial year, excluding acquisitions of fixed assets, does not exceed €250,000 per year (excluding VAT).
- They have not renounced the regime.
- They have not waived or are not exempt from the objective estimate regime of personal income tax.
- No activity is under direct estimation of personal income tax or under any of the VAT regimes that are incompatible with the simplified system.

77 *Simples Nacional* is an optional taxation regime that allows the unified collection of municipal, state and federal taxes. In addition to unifying all taxes, the rates are lower compared to the payment of each of them separately and progressively, as it is always calculated based on the monthly gross turnover of the enterprise.

Uruguay has four categories which are also based on gross income, the cost of the rent, and not exceeding the number of establishments with a fixed amount. Ecuador has seven categories based on annual income that is subdivided into eight categories based on type of activities. Each category has a fixed amount to pay monthly. Peru has two categories based on monthly income and the value of acquisitions with a fixed amount to be paid. Costa Rica has several categories depending on the type of activities carried out, based on two factors: one to determine income tax and the other to determine VAT, which apply in general over the value of acquisitions over the quarterly period.

Spain considers, among others, the salaried staff, the non-salaried staff, area of the premises and electric power consumption.

2.3.5. Advantages and disadvantages

The special schemes are different in every country that applies it, but the main incentive is to bring into the tax net any business that, due to its size or activity, operates in the informal sector because it is costly to comply with the administrative obligations of a regular tax system. The aim is to improve the tax culture in the jurisdiction.

The special schemes are not intended to generate revenue. However, they can be beneficial for tax administrations in controlling the large taxpayers through the small enterprises and their acquisitions. Hence, it is good practice for tax administrations to request small enterprises to keep information on the value of their acquisitions (e.g., Costa Rica and Peru).

An advantage of the special schemes when they cover social security contributions and retirement pension or health insurance, is that these instruments provide a minimum coverage on the business. Usually, these businesses do not have access to them.

The special schemes are beneficial for tax administrations as they reduce the amount of resources needed to audit small enterprises (e.g., they are not obliged to issue invoices). Some countries obliged these taxpayers to use cash registers and/or fiscal software to be informed about their turnover, as you can see in section 3.2. below.

An advantage for small enterprises is the low compliance costs to fulfil the requirements of special schemes as their administrative burden is not extensive. This is an incentive to be identified for tax purposes.

A disadvantage of the special schemes is that certain small enterprises may have no incentive to grow, and they may decide to remain within the parameters in order to continue benefiting from the rewards of being part of the special scheme. In South Africa, for example, the list of exclusions prevents most start-ups from opting for this scheme.

Certain countries, depending on the way the tax administration is organized, could have an issue when intending to implement these types of schemes. Some countries have a tax administration at the federal and provincial level or have different authorities to administer VAT and income tax. It can get even more complicated if the country decides to also include social security contributions as mentioned in this section, as in general, countries have a different authority to administer them.

3. The use of technology for assisting small enterprises and tax administrations

In this section, we will discuss how technology can be used to reduce compliance and administration costs and to improve the enforcement of the VAT. We will, in particular, focus on technological tools (e.g., cash registers) underlying the special regimes discussed in sections 2.1, 2.2 and 2.3.

E-invoicing will be covered in a dedicated paper and will therefore not be discussed in detail here. In this section, we will refer to the paper The use of new technologies to improve value added tax compliance, which also includes information about small enterprises.

3.1. Background

Technology enables small enterprises to consistently calculate, report and remit taxes faster, easier and in a more affordable way. Small enterprises have more limited resources to focus on tax compliance, often without full-time headcount dedicated to tax, or the budget to engage specialist tax advisers. Notwithstanding these limited resources, tax compliance is especially key for small enterprises, as the cost of non-compliance (including but not limited to assessments, interest, penalties and the cost of remediation) can significantly impact the cash and cashflow of the business. Small enterprises need certainty on their revenue, margin and costs, and any unplanned tax exposure can lead to financial and commercial issues. The use of technology can bridge this resource gap and mitigate the risk of getting tax wrong and provides greater confidence and certainty that the business is compliant.

The challenges faced by small enterprises can be further increased when they are not established in the jurisdiction where they have a liability to comply. It is entirely in the tax authority's interest to use technology to make it as easy as possible for a business to voluntarily comply with the compliance requirements it has introduced.

Furthermore, aside from ensuring that tax administrations collect the right tax at the right time, there are other additional benefits and incentives for tax administrations. Ultimately, increased use of technology by small enterprises and by tax administrations themselves, allows them to focus their own limited and finite resources on larger enterprises, where there may be more scope for errors, non-compliance and a larger amount of tax at stake. Technology can also improve the quality of data and provide tax administrations with machine-readable data and documents than can help further automate risk assessment, audits and filings.

Technology can make it easier for small enterprises to align tax management into their business processes. The additional incentive for tax administrations to encourage technology adoption and digitalization is the wider productivity gains including reduced costs for businesses, improved cashflow and increased automation. For tax administrations, it is clear that periodic indirect tax returns do not provide the transparency into transactions needed to identify errors and fraud, and therefore, technology is needed to increase the granularity of transactional data shared with tax administrations.

3.2. Cash registers and fiscal software

Fiscalization is a system designed to prevent fraud, typically in the retail sector. It involves using specially approved or accredited cash registers or fiscal software to accurately report sales direct to the tax administration. The cash register or software will typically have embedded controls to prevent sales suppression and provide real-time or periodic e-reporting of transactional data direct to the tax administration.

Aside from the mandated use of cash registers and fiscal software, tax administrations also have the ability to require businesses to issue a specific fiscal receipt to the customer. This fiscal receipt may refer to the specific cash register or software registration number used and, in some countries, include a QR code or other means for a consumer to validate the transaction themselves. QR code technology allows consumers to take an active role in auditing and validating the accuracy of reporting.

3.3. E-invoicing

E-invoicing is the exchange of machine-readable documents between a business and its customers and the tax administration. This involves a consistent mandated format of the invoice and prerequisite content. A tax authority can sit in between the two trading partners, and this provides the tax authority the ability to review, approve and validate, sign and even distribute the invoice to the customer.

Tax administrations can offer small enterprises free-of-charge access to e-invoicing portals and applications that allow e-invoices to be issued or received, or to manually report or register transactions. This reduces the cost burden for small enterprises and allows them to comply with an e-invoicing mandate without system integration or third-party involvement.

Together with data obtained through cash registers and customs declarations, there is an increasing trend among tax administrations to use e-invoicing data to pre-fill tax returns for review and validation by the taxpayer. An example of a country using pre-filled VAT returns is Chile, where the tax authority uses data obtained through e-invoicing and prepares a VAT return that is then reviewed and approved by the taxpayer. However, notwithstanding that pre-filled VAT returns can work well for small and micro enterprises with a limited number of mainly domestic transactions, tax administrations should be aware that there can be challenges in practice, particularly when it comes to medium-and large-sized enterprises with a high volume of transactions that are complex and cross-border in nature.

While e-invoicing can provide clear benefits to tax administrators, the streamlined process and focus on clean and granular data can provide clear benefits for small enterprises too. This includes reducing costs associated with paper and processing PDFs, being paid faster by suppliers and helping improve accounting processes and tax return preparation.

3.4. Tax calculation engines

One of the big challenges faced by small enterprises is the correct classification of their goods and services for indirect tax purposes i.e., the relevant rate of VAT, GST

or sales tax that is required to be charged. This is made more complex where there are complex place of supply rules that need to be considered, which will determine the jurisdiction in which the transaction is taxed. Standard enterprise resource planning (ERP) or accounting packages often don't provide sufficient functionality or rate content "out of the box" and therefore, small enterprises are often required to carry out significant customization or license a bolt-on tax engine solution. While typically, a tax engine would be licensed to a business directly by a software vendor for a subscription charge, there are examples of tax administrations subsidizing this or indeed funding this themselves. In any event, it is important for tax administrations to understand the benefit of tax engines including:

- Providing a consistent tax calculation policy based on supplier, customer and transactional data.
- Providing tax rate, classification and jurisdictional content that are regularly updated.
- Helping small businesses automatically determine and calculate the right rate of indirect tax at the point of sale.

A good example of a tax administration using local certified or accredited service providers to provide software and services to determine taxability of goods and services sold by small businesses and calculating the liability and preparing the returns, is the Streamlined Sales Tax project in the United States. The Certified Service Provider (CSP) integrates its system with the business's system to determine what is taxable, the applicable state and local tax rates and the amount of tax to collect at the time of the sale. The CSP provides free monthly return preparation and filing for the business and is compensated by the State (a US member State of the Streamlined Sales Tax).

3.5. Digital interfaces or portals

There are a number of different digital channels that tax administrations can provide to support small enterprises, reducing the need for traditional assistance via telephone or face-to-face options. These additional channels are increasingly important when the taxpayer is based in a different jurisdiction. These include:

- Webpages setting out clear guidance or Frequently Asked Questions and webforms.
- Mobile telephone applications.
- Virtual assistants and chatbots (which can be guided by AI).
- Social media channels to provide increased interaction with businesses.
- Portals for taxpayers to register for VAT/GST on digital services.
- Digital mailboxes for secure communications between tax administrations and taxpayers.

3.6. Proportionality

Technology is clearly an enabler for tax compliance, both for small enterprises and tax administrations. However, tax administrations should ensure that any additional

compliance requirements involving technology, data or changes in process are proportionate and do not provide excess complexity or cost that outweigh the benefits to both the tax administration or the business. Technology itself is not a silver bullet, but needs to be implemented together with a clear and consistent tax policy that can be understood by businesses and implemented without significant cost or major change to the business process.

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Paper III. An introduction to value added tax/goods and services tax refunds

1. Introduction

Refunds are a reality of value added tax (hereinafter referred to as VAT)[78]. The extent to which a country's VAT policy and resultant legislation provides for the offsetting of input VAT from expenses (including capital and operational expenses) against output VAT generated by sales (including both zero-rated and standard-rated sales) will be evident in the extent of legitimate refunds claimed by taxpayers.

Refunds pose an inherent risk to revenue collections, which can only be mitigated by a range of risk-mitigating interventions that should be undertaken by tax administrations.[79] On the other hand, legitimate businesses that have submitted valid refund claims rely on the prompt payment of such refunds, which if delayed, may have a devastating impact on their very existence. Striking a balance between these two competing realities for tax administrations is an ever-present challenge exacerbated by the ever-increasing reality of fraudulent refund claims.

This paper considers refunds from the perspective of both tax administrations and taxpayers. It provides an overview of the reasons for the existence of refunds and discusses the various factors that should be taken into account in the administration thereof[80]. Due to the number of papers that have been published on this particular topic, this paper does not intend to repeat what has already been published. It is therefore strongly recommended that these papers are read (for ease of reference, see footnote 80).

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78 The terms "value added tax" and "VAT" are used to refer to any national tax by whatever name or acronym it is known, such as goods and services tax (GST), that embodies the basic features of a value added tax, i.e. a broad-based tax on final consumption collected from, but in principle not borne by, businesses through a staged collection process, whatever method is used for determining the tax liability (e.g. invoice-credit method or subtraction method). Organisation for Economic Co-operation and Development (OECD), *International VAT/GST Guidelines* (Paris, 2017).

79 The term "tax administration" refers to the institution authorized to manage value added tax (VAT). In this paper as well as subsequent papers, the term may also be used interchangeably with "tax authority" or "revenue authority" as well as "revenue administration".

80 Mario Pessoa and others, "How to manage value-added tax refunds", IMF How To Notes vol. 2021, Issue No. 04 (Washington, D.C., 2021); Cedric Andrew and Katherine Baer, "How to combat value-added tax refund fraud", IMF How To Notes vol. 2023, Issue No. 01 (Washington, D.C., 2023); Graham Harrison and Russell Krelove, "VAT refunds: A review of country experience", IMF Working Paper No. 05/218 (Washington, D.C., 2005).

A key feature in a VAT/goods and services tax (GST) system is that the tax is intended to be borne by the end consumer, and to a limited extent by VAT-registered businesses, where both the policy intent and enabling legislative provisions provide for exemptions and/or limitations on input tax deductions. Further to this, an integral part of an efficient VAT system is the use of VAT-registered businesses to collect VAT from consumers[81] and paying such VAT to the tax administration.

Based on the fundamental principle of neutrality, VAT should not be a cost in business-to-business transactions. Just as the VAT received from customers is not income earned by the VAT-registered business (because it must be paid to the tax administration, see footnote 6), so too the VAT reported to the tax administration in respect of a business-to-business transaction is not tax 'revenue' because it must be repaid to the business customer through a deduction against its output tax liability. Where that deduction results in a negative amount, the tax administration is generally obligated to pay a refund.

It follows that any VAT borne by a VAT-registered business (the taxpayer) that is in excess of the VAT collected in respect of sales made by that taxpayer, will result in a credit (i.e., refund) due to the taxpayer. The prompt and full cash or electronic payment of VAT refunds is necessary to ensure that the VAT achieves its intended purpose of taxing final consumption. Where the VAT is not refunded at all, businesses may have to resort to recovering such unrecovered VAT from its customers as the business cannot afford to fund such VAT cost from its profits. In addition, in those instances where the VAT refund is delayed, businesses who incur expenses until such time that the VAT has been refunded (for example, interest charges) may recover such additional costs in the form of an increase in the price of the goods or services supplied to customers.

The value added tax value chain (VVC)

The VVC encompasses the core functions undertaken by a tax administration when administering a VAT. Set out below are the various elements of the VVC and the proposed minimum activities that are required to be undertaken by tax administrations with particular reference to the risks posed by the processing of refund claims.

I. VAT registration is a high-risk activity. It is the first engagement that a tax administration will have with potential taxpayers who have requested to register for VAT. It is essential that the information requested to be provided by the taxpayer when applying to register can be verified, preferably through third party data sources, to improve the likelihood of

81 VAT may be separately added to (VAT-exclusive) prices at the time of sale or factored into (VAT-inclusive) prices. It may also be legally imposed on businesses (the commonest approach) or imposed on customers but with a collection responsibility imposed on businesses (less common). Whichever approaches are taken, the tax fraction of the money collected by the business is not part of its income from the sale because the business is required to pass the VAT proportion of the price to the tax administration.

legitimate taxpayers being registered and thereby being given access to claim VAT[82] incurred.

The following information should, at a minimum, be requested at the time of application:

- The full name and date of birth of the natural person and the national ID card number (if applicable. Not applicable if a legal entity).
- The name of the legal entity and full name and date of birth of the natural person legally representing the legal entity (if applicable. Not applicable if a natural person).
- Postal and registration address, as well as name and contact details (email address and telephone number) of a contact person for the tax administration as well as all relevant tax reference numbers of the owners/shareholders.
- Website of the business entity (if applicable).
- The sector in which the business activities fall e.g., agriculture, construction etc.
- Date of commencement of activity.
- The date that it is liable to register for VAT.
- Bank account details.
- Any reference number with another regulated authority (if applicable).
- Turnover during three previous years (if applicable. Not applicable for new businesses).
- The value of expected sales to be made in a predetermined period e.g., 12 months from date of registration, alternatively the value of sales made in a prior period that requires a VAT registration.
- Expected percentage of exempt activities (if applicable).
- Expected application of reduced VAT rates (yes or no and which ones).

Consideration may be given to reducing the documentary requirements required for the registration for small and micro enterprises in an attempt to ease the burden for such businesses.[83]

82 'Pay-only registrations' is a regime that provides for a registered VAT person to only declare the VAT on sales made in a particular jurisdiction. In this regime, the input VAT incurred on any expenses incurred in the particular jurisdiction is not allowed as a deduction. This regime is prevalent in jurisdictions that require non-resident suppliers of goods and services to register and account for VAT on sales made to customers in that jurisdiction.

83 See *The Value Added Tax/Goods and Services Tax Treatment of Small Enterprises paper* (United Nations publication).

It is proposed that taxpayers be compelled to update their registered particulars within a specific time of any changes being made so that taxpayers can be contacted when necessary.

Depending on the relevant legislative provisions, VAT registration applications may also require in-depth evaluation to determine whether the applicant qualifies to register. Where the application is successful, the tax administration should notify the taxpayer and such notice should at a minimum, contain the VAT reference number as well as the effective date of registration.

II. The electronic filing of VAT returns allows tax administrations to continuously monitor non-compliance at an individual taxpayer level and to promptly react when non-compliance is identified e.g., non-filing of returns or non-payment of the VAT liability as reported on the relevant taxpayer's VAT return. The data obtained from the submission of VAT returns should be continuously analysed in order to provide in depth insights into, inter alia, sectoral trends and the attendant risks and opportunities to revenue collection as well as taxpayer compliance behaviour. These insights should then be used as input into the risk identification process. The analysis will also provide insights into sales and purchases trends per sector over the years.

   Valuable data insights pertaining to refunds in particular include:

   - The value of refund claims made per period
   - The value of claims processed per period
   - The value of sales (for all rates of VAT) per period
   - The value of expenses per period which generate input VAT
   - The value of import VAT as a percentage of input VAT deducted
   - The trend of sales subject to the standard VAT rate compared to the amount of input VAT on related expenses claimed as a deduction against output VAT, as reflected in relevant VAT returns. This type of analysis allows tax administrations to assess whether the VAT declared on sales by one group of taxpayers corresponds with the input VAT claimed by others. Where these two data points do not align, further investigation should take place to understand the reasons behind such deviation. It must be borne in mind that exemptions and input tax denials would result in the VAT on sales and input VAT from expenses not aligning.

III. The prompt identification of risk e.g., fraudulent refund claims, fraudulent schemes, the over or invalid deduction of input VAT incurred on expenses and/or under declaration of VAT due is crucial in protecting revenue. In order to improve the likelihood of correctly identifying taxpayer's returns that may pose a risk, it is recommended that the risk identification methodology be continuously updated with new identified risks. It is also recommended to validate for a specific period of time, taxpayers who are in a constant refund position, e.g., exporters. Such

validation will then ensure that the affected taxpayers are not continuously identified as posing a risk whenever a refund return is submitted.

It is furthermore recommended that the risk identification processes and the relevant algorithms /thresholds, etc. remain classified and limited to a small number of resources to limit the possibility of such rules being leaked. Once the cases are identified as posing a possible risk, the decision must then be taken regarding the type of enforcement action to be followed.

IV. VAT deregistration may be regarded by some tax administrations as not being a core function, particularly where resource constraints are prevalent. Furthermore, the deregistration process may not result in additional revenue being collected. Tax administrations with limited resources may therefore be inclined to ignore this function in favour of better utilizing resources in revenue-generating activities. It is recommended that regular monitoring of the VAT register is undertaken to identify those registrants who are continuously non-compliant (i.e., continuous outstanding returns or incorrect submission of nil returns) as opposed to those registrants who no longer meet the requirements of being registered, the latter having been confirmed by third-party data. It is therefore only in the latter case that registrants should be deregistered.

The reality of fraud[84]

For a refund mechanism to be trustworthy, the tax administration must ensure that it is equipped with the strategies, processes and abilities needed to identify VAT refund fraud. It must also be prepared to act quickly to combat such fraud schemes.[85]

While a VAT is premised on the principle that refunds are paid on time, the reality of fraudulent refund claims as well as the claiming of input tax deductions or credits to which the registered business is not entitled, resulting in a refund claim, is a constant reality and burden faced by tax administrations. Balancing the efficient and on time processing of refunds with the risk of refunding fraudulent and non-qualifying refunds is a difficult balancing act for tax administrations. Insufficient resources to identify possible non-compliance or suspicious refund claims, high claim volumes, financial constraints and a lack of data capacity and capability are a few of the factors that negatively impact the timely payment of refunds.

A balancing act

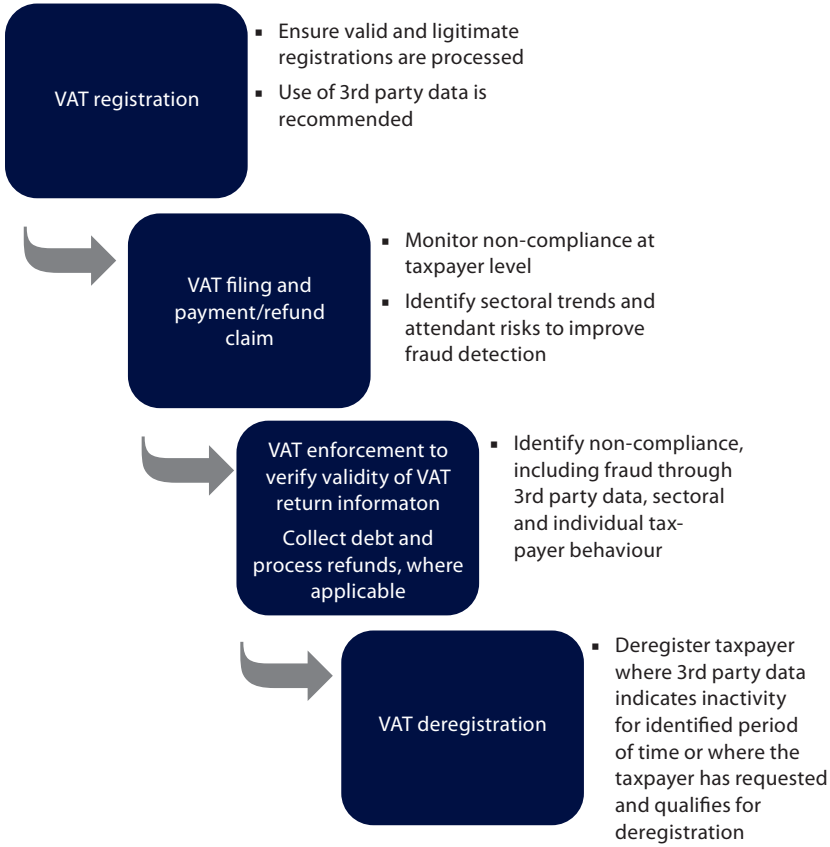
Despite all these obstacles, the implementation of a VAT requires tax administrations to develop solutions to on time process refunds (where the legislative provisions allow for such) so as to ensure that the VAT achieves its intended purpose of taxing final consumption. Failure by tax administrations to pay refunds on time without drastically

84 Rita de la Feria and Anculien Schoeman, "VAT anti-fraud policy in African countries: Addressing fraud and evasion through legal design", paper presented at the VAT symposium, South Africa, October 2016.

85 Mario Pessoa and others, "How to Manage Value-Added Tax Refunds".

increasing the compliance burden for taxpayers claiming such refunds continues, for the most part, to be an elusive goal. What is however crucial (and beneficial) to both taxpayers and tax administrations is to ensure that refunds are paid on time, which may have a positive impact on increasing the likelihood of business sustainability and continuity, and ultimately result in additional tax revenue being collected.

The VAT value chain



The impact on business

Businesses experiencing cash flow constraints would depend on the prompt refunding of refund claims in order to assist such businesses in remaining operational. The non or late payment of refunds may also result in businesses requesting temporary credit facilities from financial institutions and thereby incurring additional expenses, such as interest and overdraft fees. Such additional expenses may be the final death knell for already struggling cash-strapped businesses.

Processing of refund claims

There are various mechanisms utilized by tax administrations to process a claim submitted by a taxpayer or other person who is entitled to a refund. These include:

- The cash (or electronic) payment of the full value of the refund within a specified time.
- The partial or full offsetting of refunds against a taxpayer's other outstanding or future tax liabilities.
- Delayed payment of the refund.
- The issuing of government bonds or tax certificates in lieu of refunds that are due.

The electronic payment of qualifying refunds into the registered banking account of the taxpayer is obviously preferred by taxpayers. Similarly, the non-payment of refunds as well as the offsetting of refunds in future tax periods is not recommended both in terms of the overall VAT design and also due to the negative impact that such non-payment has on the registered business.

2. The reality of the existence of refunds in a value added tax

In order to determine its VAT liability, a taxpayer is generally required to submit a VAT return on predetermined dates, for a specific period, indicating at a minimum, the value of its standard, reduced, zero-rated and other sales and the VAT that is due in respect thereof. The taxpayer is also entitled to deduct the VAT incurred on qualifying purchases. Where the VAT collected exceeds the VAT incurred, the taxpayer is required to submit its return and pay such VAT to the tax administration within the requisite time. Conversely, where the VAT incurred exceeds the VAT collected, the taxpayer will submit a return reflecting the refund that is due to it.

Factors that give rise to refunds

— **Exports**

In line with the principle that VAT is a consumption tax due in the jurisdiction of consumption, it follows that exports should be zero-rated (i.e., in accordance with the destination principle) while imports should be taxed at the same rate as similar products in the jurisdiction.

A VAT refund would arise where exporters incur local standard-rated VAT when purchasing goods and services required to produce the exported goods or services. As there would be zero VAT levied on the exported sales, the VAT incurred should qualify for an input tax deduction, which will result in the exporter claiming a refund from the tax administration.

— **Zero-rating local consumption**

The rationale for zero-rating the local supply of goods and services is generally based on the principle that they qualify as 'merit goods and services' and as such are deserving of a different VAT rate. Studies have however shown that the zero-rating of

local supplies benefits the more affluent in society due to the fact that there are higher levels of consumption by this sector of society.[86]

It is recommended that the policy rationale for zero-rating locally consumed goods and services is reconsidered with a view to identifying whether the original policy intent is being achieved and whether there are viable alternative options that would better achieve the original policy intent.

— **Capital expenditure**

Newly established businesses will generally incur capital expenditure which may, in all likelihood, be incurred prior to any income being earned or which may exceed any income that has already been earned. In addition, established businesses may incur capital expenditure due, for example, to expansion or replacement of capital goods. Capital expenditure may also extend to the importation of goods. The VAT on such expenditure should be allowed as a deduction, together with the VAT incurred on importation, and where such VAT exceeds the taxable income earned, a refund will be due to the taxpayer for the particular period.

— **Seasonal expenditure**

VAT refunds may occur at certain times during the year when the input VAT incurred on expenses exceeds the VAT collected on sales. Common examples include stock purchases and the importation of goods for future high trading periods. Farmers and other primary producers also tend to have seasonal imbalances between high revenue tax periods and high expenditure tax periods.

— **Multiple rates**

Multiple rates present compliance challenges for both tax administrations and taxpayers alike. The imposition of VAT at a higher rate on the acquisition of goods or services that are ultimately used to produce goods or services that qualify to be supplied at a reduced rate, would likely result in the taxpayer submitting a refund claim.

— **A refund scheme for tourists**

In this instance, in line with the consumption principle, and where legislative provision is made for such dispensation, the VAT incurred on goods purchased and subsequently exported by the purchaser to a country of destination, may result in a claim for the refund of VAT incurred by the tourist. The refunding of such VAT, may, depending on the refund mechanism, fall outside the standard process provided to registered taxpayers. In this instance, it is recommended that such claims are budgeted for and subject to relevant risk processes.

86 Ada Jansen and Estian Calitz, "Reconsidering the effectiveness of zero-rating of value-added tax in South Africa". Research Project on Employment, Income Distribution and Inclusive Growth (REDI3X3) Working Paper No. 9 (Cape Town, The University of Cape Town, 2015).

— **Refunds to non-established businesses as well as diplomatic missions**

The refunding of VAT incurred by non-resident/established businesses and diplomatic missions is dependent on whether legislative provision is made for such claims. The likely impact of such refunds on the forecasted refund value should take these claims into account, particularly where such claims fall outside of the standard refund process. It is recommended that adequate risk mitigation and identification of fraudulent schemes are implemented for this sector to minimize the risk of invalid refund claims being processed.

It is likely that the value of the VAT incurred by non-resident businesses would not be material when compared to that of local businesses, coupled with the fact that the destination principle should result in minimal VAT being levied on supplies made to the non-resident. Examples of VAT being incurred by non-resident businesses would be hotel accommodation and transport, which are normally not deductible.

3. Mechanisms to request refunds

a. There are various processes that have been implemented by jurisdictions for taxpayers and VAT refund claimants to request a refund of the VAT incurred. These include the submission of :
   - A VAT return reflecting the refund due.
   - A specific form, other than the registered taxpayer's VAT return.
   - A letter requesting the refund addressed to the relevant department of the tax administration.

b. Submission of supporting documents.

There may also be instances where the claim for the refund must be accompanied by the relevant qualifying documents substantiating the VAT incurred. In the event that the tax administration does not always review the documents that are required to be submitted, it is recommended that such requirement be reconsidered. The removal of the mandatory submission of qualifying documents would positively impact taxpayers as there would be a reduction in the taxpayer's compliance burden.

Tax administrations may request specific documentation in the event that the refund claim has been identified for audit. In this instance, it is recommended that the request for documentation should be specific to the risk being identified and be limited, as far as possible, to a reasonable amount of information to be provided. General and vague requests for information impose an unnecessary burden on taxpayers and furthermore, if not used by the tax administration, can be regarded as an ineffective use of both taxpayer and tax administration resources.

The manual submission of documents, as opposed to the digital transfer of documents to the tax administration, presents a risk due to the likelihood of the documents being lost or destroyed after they have been submitted to the tax administration. It is therefore recommended that tax administrations issue and receive all documentation electronically, the obvious benefit being that there is an automated audit trail of all correspondence.

4. Budgeting for refunds to be paid in a fiscal year

Tax administrations and any other relevant government departments (where applicable) should forecast the expected refund claims and payments to be processed and paid for all months in a fiscal year. Such forecasting is essential to ensure sufficient cashflow management for the payment of qualifying refunds. In addition, the forecasting of refunds, as well as the actual payment thereof, is also crucial in determining the net revenue collections for specific monthly periods and the applicable fiscal year.

A country's VAT refund level (in percent of gross VAT collections) is influenced by a number of factors, including (1) the nature of the economy (e.g., extent to which investment generates excess VAT credits, value-added of export industries, and proportion of standard-rated and zero-rated sales in the economy); (2) the design of the VAT system, particularly the extent of zero-rating and use of multiple rates; (3) taxpayer compliance behaviour and extent of VAT fraud; and (4) the system and culture of the tax administration (e.g., level of corruption, capacity to detect and prevent VAT fraud and commitment to taxpayer service in meeting statutory payment deadlines).

Everything else equal, the level of VAT refunds is likely to be higher in countries with more open and faster-growing economies (i.e., where there are higher export and investment shares in total economic activity), as well as in countries with modern tax systems and administrations that apply self-assessment procedures and respect taxpayers' rights, including minimizing tax compliance costs. Conversely, refunds will be lower where countries have adopted specific schemes to reduce the number and size of refund claims. These schemes include such measures as zero-rating supplies to exporters and deferring VAT liabilities on imported capital equipment. Finally, refund levels will also be lower in countries where tax administrations and treasuries deny refund claims during periods of government cash shortages.[87]

The IMF has developed a model that provides an approximation of the reasonable level of refunds that should be paid within a specific period.[88] This model is an excellent starting point for tax administrations (and relevant government departments).

5. Tax administration — Reasons for refunds not being paid on time or not being paid at all

a. Cash flow limitations

The deduction of VAT incurred by a taxpayer, which may result in a refund due to the taxpayer, can present cash flow difficulties to tax administrations. Inadequate budgeting for the payment of qualifying refunds and/or a shortage of tax revenue to process the qualifying refund are realities that are faced by tax administrations.

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87 Graham Harrison and Russell Krelove, "VAT refunds: A review of country experience".

88 International Monetary Fund, "VAT", Tax Policy Assessment Framework. Available at https://www.imf.org/external/np/fad/tpaf/pages/vat.htm.

b. Refunds below a certain threshold (de minimis rule)

To reduce the cost of administration, tax administrations may elect not to process refunds below a certain threshold. Such refunds should then be offset against future VAT liabilities.

c. Resource constraints

The inherent risks associated with refunds may lead administrations to delay refunds, particularly if the tax administration has inadequate resources, including skilled personnel, to establish an effective risk identification and management process.

The identification of risk and the tax administration's appetite for paying refunds, without first auditing the claims, have an inevitable impact on the time within which refunds are processed.

d. Low compliance levels

Provision may be made for the non -payment of refunds where the taxpayer is non-compliant in respect of its VAT and/or other tax obligations. In this instance, depending on the legislative provisions, interest may not be payable on the outstanding refund.

The view may be held that the payment of refunds to non-compliant taxpayers would not encourage the regularization of non-compliance. On the other hand, the non-payment of refunds, where such refund is legitimately due, may have dire consequences for the taxpayer. Consideration should therefore be given to the most appropriate course of action to be taken by tax administrations which may include taxpayer education and compliance improvement initiatives.

e. Invalid taxpayer details on register

A tax administration may be unable to effect payment of a refund into a taxpayer's designated bank account if the details provided by the taxpayer are incorrect. In this instance, it is recommended that taxpayers are afforded various opportunities through designated channels offered by the tax administration to amend or update their registered particulars, together with the necessary supporting documentation and third-party validation, to enable tax administrations to effect the payment of the refund.

f. Time limitation to submit refund claims or to deduct input tax

One of the mechanisms for managing the claiming and payment of a refunds is to prescribe the time period within which the refund claim must be submitted.

While tax administrations require a degree of certainty in projecting the value of their refunds to be paid in current and future periods, it is recommended that a balance be struck between the period that provides taxpayers to submit their refund claims and the certainty that tax administrators require.

In addition, legislative provisions may provide for limiting the time within which a taxpayer may deduct VAT incurred. Possible considerations include limiting the period to align with the corporate income tax prescription period or determining a

period that is either in excess of or less than the aforementioned period, the reason being that expenses deducted for corporate income tax purposes should generally be exclusive of the VAT where such input VAT is allowed to be deducted in the taxpayer's VAT return.

g. Payment of interest for delayed refunds

In order to achieve the VAT's overall intent, policymakers should ensure that legislative provision is made to refund legitimate refunds within a specific time period. Failure by the tax administration to refund the VAT due should result in the payment of interest to the taxpayer. Such interest payment, which would negatively impact the revenue collected in that it is a drawback on the revenue collected, is compensation to those taxpayers who were not refunded on time. It is furthermore intended to be a deterrent to tax administrations from delaying the payment of refunds. However, the payment of interest for the late refunding of VAT refunds may, by no means, be adequate compensation to the taxpayer, particularly where the taxpayer is reliant on the refund for business continuity.

6. Impact on taxpayers where inefficient refund mechanisms/processes exist

Acknowledging that VAT-registered businesses play a key role in the collection of VAT emphasizes the importance of an efficient and robust mechanism for managing and paying VAT refunds.

There may be systems in place to pressure tax administrators to pay the VAT refunds, but these processes are time-consuming and costly.

a. Negative cashflow, interest expense and exchange rate fluctuations

A consequence of the accrual-based system of accounting for VAT is that VAT-registered businesses are required to pay over output VAT charged on sales despite not having actually collected the VAT from their customers at the time that such VAT is paid to the tax administration. This requirement places a strain on the cashflow of the VAT-registered business as the business is required to fund the payment of VAT due.

This is further compounded when there are delays in the payment of VAT refunds. Businesses may, in some instances, be forced to fund the payment of VAT and the delayed VAT refunds by raising funds from external sources. This creates an additional interest expense for businesses. Businesses that are unable to raise external funding may face dire consequences, which can lead to business closure or default on other financial commitments.

b. Costs incurred e.g., Professional services to engage with tax administration due to, inter alia, the increased likelihood of audits, follow up regarding outstanding refunds.

The processes of VAT refund enforcement activity (e.g., audits) and obtaining outstanding VAT refund pay-outs have become complicated and also time-consuming

for businesses. While there is an acceptance that tax administrators have to implement steps to prevent tax evasion and the payment of undue refunds, caution should be exercised in the demands placed on taxpayers to communicate and provide information to the tax administration, which may create a burden on taxpayers' available resources.

Many businesses may therefore prefer to hire external professional service providers.

Both these options (additional resources or external professional service providers) are expensive and impose an additional cost on businesses.

c. Impact on business — contradicts principle of VAT not being a cost to VAT-registered business

Increases cost for business that will ultimately be passed on to the consumer, or decrease business profits and result in tax cascading, where consumers are VAT-registered businesses.

7. Tax administration considerations

a. Registration risk

The registering and subsequent issuing of a VAT number requires a taxpayer to levy VAT on its taxable transactions and account for and pay such VAT to the tax administration. In addition, the taxpayer is entitled to deduct the input VAT incurred on qualifying expenses. As discussed above, the registration process is the most important line of defence against admitting fraudulent taxpayers into the VAT net.

b. Revenue risk mitigation

Efficiently identifying risk in the refund process is key in reducing unnecessary engagements with taxpayers. It is recommended that general, as well as, sectoral-specific risks are continuously identified and implemented by the tax administration to reduce the likelihood of processing invalid refund claims. Engaging with other tax administrations to obtain information on current and past refund scams would assist tax administrations in pre-empting fraudulent claims being processed.

c. Resource allocation

Tax administrations should consider the adequate allocation of resources throughout the VAT value chain in order to improve service delivery and overall taxpayer experience. The use of data and automation in the value chain would assist tax administrations in effectively allocating appropriate resources. Upskilling appropriate staff would also enable tax administrations to reallocate staff to different business units when required.

8. Conclusion

The forecasting, budgeting, assessment of risk and ultimate processing of VAT refunds is a complex process that spans across multiple stages in a tax administration's operations. The efficient balancing of adequately budgeting for the payment of refunds,

processing valid refund claims within legislatively provided time periods and the reality of ever-increasing fraudulent VAT refund schemes being perpetuated against tax administrations, requires tax administrations to constantly improve the relevant processes. The importance of legitimate VAT refunds being paid on time to taxpayers is crucial in ensuring that the VAT achieves its ultimate purpose of taxing final consumption.

9. Annex

A. Pakistan: Automation of sales tax refunds—A case study

1. Background

The tax system of Pakistan has undergone significant reforms over the past five years, inter alia, leading to the modernization of both direct and indirect tax refunds. Pakistan simultaneously remained focused on bolstering exports to stimulate economic growth and increasing tax revenues. Perking up investment, exports and revenues as a percentage of gross domestic product (GDP) is essential for guaranteeing the desired level of growth in an economy over medium and short terms. Sustainable economic growth depends on exports as it supports earning foreign income to finance imports, servicing foreign debt, stabilizing foreign exchange and overcoming the persistent problem of balance of payment deficit. For a developing country, an export-led growth strategy is one where a country seeks economic development by opening up to international trade and foreign direct investment through liberalization and structural reforms. The opposite of an export-led growth strategy is import substitution, where countries strive to become self-sufficient by developing their own manufacturing industries through incentive-led investments.

Most countries, for multiple reasons, tend to tax raw materials at the import stage and then refund the tax to the extent attributable to exports undertaken and adjust against final tax liability the sum attributable to local supplies in the domestic market. The problem of exporters of first paying taxes and then later struggling to obtain refunds is an arduous policy choice and a disincentive for several reasons. Pakistan, like most developing countries, due to omnipresent fiscal constraints, was traditionally not paying refunds due, or would not collect tax at the time of purchase or import of raw material, thereby leaving holes in the taxation of the entire value chain – the so-called, zero-rating regime. Illustratively, at the onset of fiscal year (FY) 2020-2021, the government owed refunds worth over Rs 350 billion to exporters, which was almost 1 per cent of the total tax revenue collected for the year.

2. Zero-rating regime

The zero-rated regime on local supplies for the whole textile supply chain was first introduced through Finance Act 2005 to stimulate export-oriented sectors in Pakistan and to minimize tax fraud through fake and flying invoices, which was purportedly resulting in more refunds than tax collection. Zero-rating was then withdrawn in 2013, without providing the expeditious refund system promised, thereby creating a liquidity crunch for exporters, and compelling them to borrow from the

banking sector to run their production process. Zero-rating was restored in 2016, but was finally rescinded for the export-based industries in the June 2019 budget announcement.[89]

The net effect of the Statutory Regulatory Order (SRO) 694 was that from July 01, 2019, the items listed in the said SRO had been made liable to sales tax at 17 per cent at the import and local supply stage. However, in case of integrated retail outlets, sales tax on finished textile and leather items were subject to 14 per cent sales tax, according to the circular. The tax administration argued that the decision to eliminate the zero-rating regime was taken due to the gross misuse of the scheme. It was also widely believed that the zero-rating regime had been used for the issuance of bogus refunds through the use of fake and flying invoices resulting in huge monetary losses to the national exchequer.

The Federal Board of Revenue (FBR) estimated that the domestic sales of the sector were about 40 per cent of industrial output, and somehow the sector was evading massive amounts of sales tax on domestic sales. After the withdrawal of zero-rating, net sales tax collection from textile sectors sharply increased to Rs 61.2 billion during the fiscal year 2020 as compared to Rs 8.7 billion in the preceding fiscal year, reflecting a growth of a little over six times. This unprecedented growth in sales tax collection from the sector could be attributed to the elimination of the zero-rating scheme through Finance Act, 2019, although the collection of sales tax from the textile sector would have been much higher but for the COVID-19-induced economic slowdown. Later, in the post COVID-19 period, the export industry benefitted from the rising global demand, with textile exports registering an all-time high growth of 36 per cent in the year 2021.

3. The Fully Automated Sales Tax Electronic Refund (FASTER) system

In order to resolve the issue of exporters in obtaining refunds under new schemes from July 01, 2019, the FBR introduced the Fully Automated Sales Tax e-Refund (FASTER) system with a commitment and a mechanism that the refunds would be issued in 72 hours. This automated system ensured disbursement of refunds in an expeditious and transparent manner to ensure that exporters did not face any liquidity crisis.

To achieve the overall intent of a post zero-rated regime, the challenge before the tax administration was three-fold: (a) to issue refunds on time; (b) to issue refunds correctly without any element of fraud; and (c) to take out all possibilities of rent-seeking. Particularly, while a sales tax premised on the principle that refunds are paid on time, the reality of fraudulent refund claims as well as the submission of non-qualifying input tax credits using fake and flying invoices that result in a refund claim, was a constant reality and burden faced by the tax machinery like in many other countries, particularly developing ones.

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89 The Federal Board of Revenue's Statutory Regulatory Order (SRO) 694(I)/2019 dated June 29, 2019 rescinding SRO 1125(I)/2011 dated December 12, 2011 w.e.f. July 2019 explanation to which was provided vide Circular No. 1 of 2019, dated July 26, 2019.

A key element of a good refund system is a continuous process of identification of risks and mitigation techniques to sort out fraudulent refund claimants as well as suppliers in a whole supply chain. A rule-based system allows for the bulk processing and risk assessment of invoices and the return data, thus enabling data to be reviewed against a set of risk indicators and the calculation results to be used for deferring invalid claims. Therefore, risky profiles are not processed under FASTER, instead, they are forwarded for manual processing.

4. FASTER process flow

The following are the stages involved in the automatic goods and services (GST) refund process:

- Issuance of sales invoices:
  - Electronic invoicing.
  - Point of Sales (POS) integrated invoices.
  - Batch invoice submission.
  - Filing of sales tax return or monthly declaration.
- Submission of refund application or consumption statement:
- Processing of refund:
  - Electronic refund processing (automatic).
  - Manual processing.
- Payment of refund:
  - PO (payment order), cheques or tradeable bond.
  - Electronic payment.

5. FASTER system — Salient features

The following are the technical features for refund processing in the FASTER system:

a. The FASTER system does not take refunds as an isolated process but as a cog in the wheel of an integrated system in the whole supply chain for purchases of goods and services from suppliers at multiple tiers. Sales tax paid on purchases termed as input tax credit; i.e., tax paid by a taxable business in relation to goods or services supplied to it or imported for the purpose of business activity. This input tax credit (ITC) is adjustable against the output tax accrued against taxable supplies and excess of credit is refundable.

b. The FASTER system's success relies on the validity of input tax credit in the credit ledger of sales tax return in a supply chain based on a pre-verified sales tax invoice verification system commensurate with the refund demanded by the claimant, thus linking a whole supply chain of VAT regime of suppliers, wholesalers, distributors, manufacturers, importers and end-consumers. The system guarantees that buyers only claim valid input tax credit against which the return is submitted and due taxes are paid. Thus, there is no need for the time-consuming, cumbersome

process of cross-matching of the particulars of invoices between the buyers and the suppliers. This mechanism successfully eliminates fake invoicing in the VAT regime, meaning that there is no chance of claim of a credit against which tax is not paid. This mechanism not only reduced the time and effort of data entry but also eliminated errors and false declarations.

c. The FASTER system framework of invoice verification provides control of duplicate claims of credit on the same document, which was possible in the manual cross-matching technique.

d. Another big issue was of flying invoices, where tax is paid for the purpose other than the refund claim against the exports, but credit invoice is purchased from the market of non-relevant goods or same goods but for the end consumer. The FASTER system's built-in relevancy framework manages a negative list of Harmonized System (HS) Codes which are declared non-admissible to block such refund claims and forward the same for audit.

e. The system uses classification of inputs into categories and risk scoring, both quantitatively and qualitatively, for marking dynamic thresholds to manage excess refund claims.

f. Some of the critical ratios and risk parameters built into the system are as follows:

- Total ratio of power or energy consumed.
- Total ratio of basic raw material.
- Total ratio of packing material.
- Total ratio of services consumed.
- Total ratio of plant and machinery credit used for the claim.
- Total ratio of finished product consumed.

g. To restrict erroneous filing of refund claims and to ensure that only valid refund claims are filed, entry-gate validation check points have been applied in the FASTER system. This ensures that all the filed refunds are processed. No refund claim is stuck at the pre-processing stage.

h. If a refund claimant files their refund claim with errors, the system would guide them upfront during filing in easy non-technical language.

i. Parameters have been updated to categories ex-zero-rated sectors so that refund claims are properly channelled through the FASTER module.

j. Suspected refund claimants and suppliers are filtered on risk-based criteria to disallow refund claims on an automatic basis.

k. Export is verified for consumption with Pakistan Customs data and realization of export remittances is verified from the banks through an integrated system based on risk.

l. Auto-implementation of the negative list of HS Codes for admissibility of credit.

m. Auto-updating and management of the risk register based on thresholds, sectoral profile and benchmarks.

n. Random audit selection of processed refunds for review of risk register. Dashboard to view the stage-wise update regarding refund claims without contacting any officials.

o. A mobile app, which enables GST refund claimants to view the status of their refunds claim at each stage of processing, has been made part of the FASTER Plus system – a newer version of the FASTER system.

p. Updates on refund status could also be ascertained by sending an SMS to 9966 through the registered mobile number of the refund claimant.

q. Risk evaluation and assessment of taxpayers' profile to incorporate in refund processing.

r. Marking and updating the negative list of HS Codes for input tax credit.

s. Management of first in, first out (FIFO) queue in every stage of processing.

t. Issuance of online payment using real-time gross settlement system of central bank through a centralized payment system.

Conclusion

The FASTER system processes more than 90 per cent of the claims within 24 hours of filing, and those identified as risky are deferred for another review and manual reprocessing. The system is fully automatic, centralized and encrypted for safety. Risks involved in refund processing are mitigated through a post-refund audit processing. The FASTER system has conveniently taken the pressure off the political governments for the prompt release of funds, and from exporters as they now do not have to pay avoidable production costs and render them price-competitive in the international market.

B. Mexico: IMMEX program

There is a special program focused on exporting companies in Mexico, called the *Industria Manufacturera Maquiladora y de Servicios de Exportación* (IMMEX) program, whose purpose is to support this industry through VAT payment facilities.

In order to have access to this program, companies must comply with a registration before the authorities to be certified as members of the IMMEX program. It is worth noting that it has been a very beneficial program for Mexico and for the certified companies, since it has strengthened the export of products manufactured in Mexico to foreign countries and, likewise, it has been an effective program for the detection and prevention of fraud related to VAT refund requests, since there is strict control over who are the participants of this program.

In order to have access to this program, taxpayers must comply with several requirements, such as the following:

1. Export value

An IMMEX company has to perform annual export sales that amount to at least US$500,000, or their billed exports must represent at least 10 per cent of its total turnover.

2. Legal and tax compliance

To be a legal entity and be taxed under the general regime of the Mexican income tax law, taxpayers must obtain a tax identification and designate a legal representative.

3. Authorized facilities

Maintain the material object of *maquila* (or *maquiladora* is a factory in Mexico run by a foreign company and exporting its products to the country of that company) in the indicated facilities, within Mexican territory.

4. Inventory requirements

To use the goods for the purpose for which they were authorized and have inventory control.

5. Annual report

An IMMEX company has to submit electronically an annual report no later than the last business day of May to the tax administration service, to notify its total sales and exports of the previous tax year.

6. Statistics reports

An IMMEX company has to submit information to the National Institute of Statistics and Geography (INEGI, Spanish acronym) for statistical purposes.

7. Filing of documents

To request the benefits of the IMMEX program, companies have to fill out the application with the Mexican government, attaching among others, documentation as certified copy of the company's Articles of Incorporation and, where appropriate, its amendments; *maquila* contract, purchase contract, purchase orders or confirmed orders, which prove the existence of the export project and a free-format letter detailing the production process or services referred to in the program application.

C. Refund statistics

Set out below is a recommended initial list of analyses[90] that can be performed by a tax administration as a means of monitoring VAT refund claims and payment performance. Anomalies in refund claims and overall VAT performance can therefore be identified and action taken, where necessary.

90 International Survey on Revenue Administration, "Revenue collected by tax administration to GDP", RA-FIT Data. Available at: https://data.rafit.org/?sk=8b00878 8-ebde-4d61-bc90-7438d6aa12dc&sId=1637191240032.

- VAT as a percentage of GDP.
- Refunds as a percentage of VAT collections including import VAT.
- Best practice – Monitoring of refunds year-on-year, sectors, trends.
- Analytical tools to estimate refunds for an identified period including the functionality to monitor and adjust where necessary.
- Refund claims vs refunds paid (i.e., liability management).
- Highest contributing sectors in terms of value and number of claims.
- Comparison to prior years of VAT refund claims and values.
- Import VAT paid by importers and the impact if any on importers' VAT liability.
- The impact of standard-rated purchases and VAT paid on import where such results in the submission of credit returns.
- Trends in VAT registration applications – Nature of persons and regular monitoring of new registrants' VAT liability or refund claims.
- The yield arising from VAT refund audits including the number of cases resulting in litigation and the final outcome thereof.

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Paper IV. The use of new technologies to improve value added tax compliance

1. Introduction

Due to the relevance of value added tax (hereinafter referred to as VAT) in tax revenue everywhere, but especially in developing countries,[91] and the huge amount of microdata involved in its fair and efficient administration, new technologies are now being explored as a promising field to improve VAT compliance.

Departing from the work already done to gather and review these new technologies, this paper summarizes the options opened to enhance the tracking of VAT data, improve tax services and tax fulfillment, favoring voluntary compliance and exploiting tax data analysis to enforce compliance in an environment of high-quality data governance.

This paper aims to give an overview of all these topics, presenting the different options and encouraging deeper analysis by individual countries to design and adapt new technologies to improve VAT compliance according to their particular needs, restrictions and possibilities.

2. Background: Sources of information on current developments on tax administration, value added tax and technology

The use of new technologies to improve tax administration and VAT compliance is now clearly the mainstream. Fortunately, we can count on several sources to track these new developments around the world. This section reviews some of these sources to observe how technologies are changing the way tax administrations[92] operate and where they are being implemented.[93]

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91 According to Organisation for Economic Co-operation and Development (OECD) statistics, value added tax (VAT) accounts for around 20 per cent of total tax revenue (including taxes and social security contributions) on average in OECD countries, while the percentage is higher in other regions such as Latin-America and the Caribbean (27 per cent), Asia-Pacific (23 per cent) and Africa (28 per cent).

92 The term "tax administration" refers to the institution authorized to manage VAT. In this paper, as well as subsequent papers, the term may also be used interchangeably with "tax authority" or "revenue authority" as well as "revenue administration".

93 Previous overviews on this topic are available in these publications: Inter-American Center of Tax Administrations (CIAT), *ICT as a Strategic Tool to Leapfrog the Efficiency of Tax Administrations* (Panama City, 2020) or OECD, *Supporting the Digitalisation of Developing Country Tax Administrations,* Forum on Tax Administration, (Paris, 2021).

To start, the International Survey on Revenue Administrations (ISORA)[94] offers free-access information[95] on all the basic tax administration operations[96] in 174 countries updated annually. Regarding digitalization, innovation and new technologies, ISORA provides evidence on:

- **Operational digitalization.** This includes electronic payment ratios, electronic filing ratios for the main taxes (income taxes and VAT), the effective use of digital contact channels for taxpayer services and the availability of digital tax registration channels.
- **Technological innovation.** This covers the effective use of innovative techniques and tools oriented to tax management such as data analytical science, cloud computing, artificial intelligence (AI), distributed ledger technology (blockchain), application programming interfaces (APIs), digital identification technologies, virtual assistants, whole-of-government identification systems and robotic automation of processes.
- **Other innovations for compliance improvement.** This comprises cooperative approaches, behavioral insight, electronic invoicing or pre-filled tax returns, among others.
- **Resources and budget.** This includes availability and effective use of human and economic resources available to each tax administration.

Based on this database, the Innovation, Digitalization and Technology Index (INDITEC)[97] provides a detailed and systematic picture of the status of tax collection agencies around the world in terms of the incorporation of technological innovations to improve tax compliance and statistical information management, the digital transformation of operational processes and the strategic orientation of available financial and human resources.

Table 1 and Figure 1 synthesize the overview of the use of new technologies in tax administrations. If the individual results are summarized according to the income level (using the World Bank classification criteria), a clear positive association can be detected, where the average values grow with income and reach their maximum in the group of high-income countries, as the trend most noticeable with regard to the dimensions of technological innovation and operational digitalization.

The Inventory of Tax Technology Initiatives (ITTI) by the Organisation for Economic Co-operation and Development (OECD), is another essential source of information,

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94 Developed by CIAT, International Monetary Fund (IMF), Intra-European Organization of Tax Administrations (IOTA), OECD and with the collaboration of the Asian Development Bank (ADB).

95 Available at https://data.rafit.org/?sk=ba91013d-3261-42f8-a931-a829a78cb1ec&sId=1445908451587.

96 These include revenue collection, resources and information and communication technology (ICT) infrastructure, staff, operating metrics (registration, filling, payment, arrears, audit, dispute resolution, etc.), stakeholder interactions, etc.

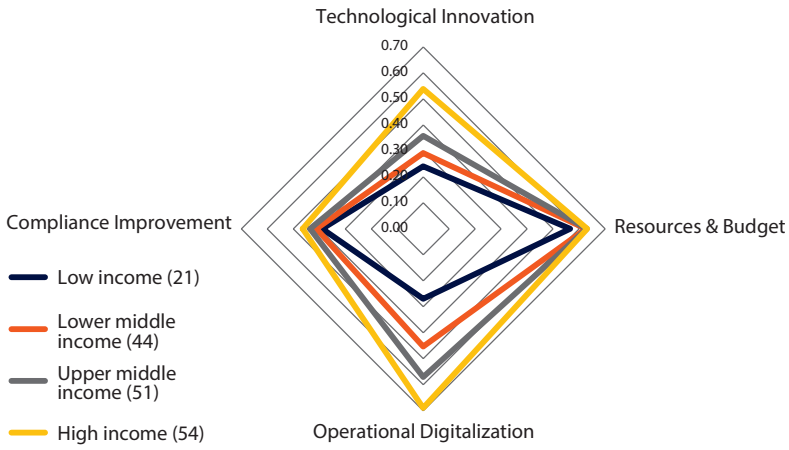
97 Available at https://www.ciat.org/tax-performance/?lang=en.

Table 1: Innovation, Digitalization & Technology Index (INDITEC) for tax administrations around the world (2021)

	Jurisdiction			
Index	**Low income** (21)	**Lower middle income** (44)	**Upper middle income** (51)	**High income** (54)
Technological Innovation	0.24	0.29	0.36	0.54
Resources & Budget	0.57	0.63	0.63	0.63
Operational Digitalization	0.27	0.45	0.57	0.69
Compliance Improvement	0.39	0.41	0.44	0.46

Source: Morán, D. and Díaz de Sarralde, S. (2024) based on 2022 ISORA survey.

Figure I: Figure I: Innovation, Digitalization & Technology Index (INDITEC) for tax administrations around the world (2021)



Source: Morán, D. and Díaz de Sarralde, S. (2024) based on 2022 ISORA survey.

containing evidence on technology tools and digitalization solutions implemented by tax administrations.[98] Specifically in relation to VAT, the ITTI[99] database provides a better understanding of how administrations and policymakers are increasingly looking at the opportunities offered by digitalization to help reduce their VAT gap, including by:

- Increasing electronic recording and/or reporting requirements on transactions, for example through requirements to use electronic invoices (e-invoices), store transaction information on approved devices, or provide tax administrations access to invoice information electronically.
- Developing new approaches to VAT collection on online sales, in particular by imposing collection obligations on digital platform operators for the VAT on e-commerce sales that are carried out on their platforms.
- Enhancing risk assessment through the incorporation of a greater range of data sources and the use of new analytics tools including, in some cases, the use of AI.
- Improving online services to make it easier for taxpayers to understand their tax obligations, interact with the tax administration and report their activities that are subject to VAT. This can include providing third parties with software that allows them to embed tax services and processes in the natural systems used by businesses.

Additionally, aside from these benchmarking tools, digital maturity models have been developed to assist tax administrations in self-assessment or in the expert-assisted assessment of their organizations. For example, OECD´s Digital Transformation Maturity Model,[100] developed in 2021 and updated in 2022 explores the six key building blocks of future tax administration (digital identity, taxpayer touchpoints, data management and standards, tax rule management and application, new skill sets and governance frameworks), establishing for each of the themes, a descriptor of maturity classified into emerging, progressing, established, leading and aspirational.[101]

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98 Currently, 80 countries have filled the survey. The Inventory of Tax Technology Initiatives (ITTI) was developed by the OECD with the assistance of its ISORA partners namely, the Inter-American Center of Tax Administrations, International Monetary Fund, Intra-European Organisation of Tax Administrations, Asian Development Bank, African Tax Administration Forum, Cercle de Réflexion et d'Échange des Dirigeants des Administrations Fiscale, Commonwealth Association of Tax Administrators, Pacific Islands Tax Administrators Association, and the Study Group on Asia-Pacific Tax Administration and Research. Data used in the inventory is available at https://www.oecd.org/tax/forum-on-tax-administration/tax-technology-tools-and-digital-solutions/.

99 Available at https://www.oecd.org/tax/forum-on-tax-administration/tax-technology-tools-and-digital-solutions/value-added-tax.htm.

100 Available at https://www.oecd.org/content/dam/oecd/en/topics/policy-issues/tax-administration/digital-transformation-maturity-model.pdf.

101 This model could be complemented by the Analytics Maturity Model, developed by the Analytics Community of Interest in the Forum on Tax Administration (FTA), together with the FTA Secretariat, to facilitate self-assessments by tax administrations globally

Meanwhile, the Digital Maturity Index (DMI)[102] of the Inter-American Development Bank (IDB) aims at evaluating, in a standardized form, the efforts carried out by tax administrations to transform themselves into digital institutions and providing a road-map for those responsible for tax collection to advance the digital transformation process. DMI identified that the best practices are based on the following principles: data enters the system only once (data-only-once), data is managed and processed centrally for various products and services (single source of truth), data travels and is stored on digital media (paperless) and information is received and processed in real time. Under these principles and best practices, the index builds a scale with four levels of maturity: beginner, intermediate, advanced and best practices. The DMI dimensions are grouped, on the one hand, in the enablers of the digital transformation process, such as the country's digital environment and the resources available to the tax administration. On the other hand, the model group the digital transformation under the information process approach, the collection of data, and the generation of digital products and services.

Finally, other well-known, more general tax administration assessment tools, such as the Tax Administration Diagnostic Assessment Tool (TADAT)[103] and Development of Implementation and Monitoring Directives for Tax Reform (Tax DIAMOND),[104] include valuable information about tax administrations' digitalization and ICT developments in some of their sections.

All these developments offer tax administrations some tools for benchmarking, self-assessment and identifying good practices in the field of new technologies and digitalization. The next sections will go deeper into the key stages of adapting efficient strategies to leverage these innovations to improve VAT compliance.

3. New technologies to track commercial transactions and value added tax data

The cornerstone of the administration and control of the VAT, is the reliable, timely and complete knowledge of commercial transactions, minimizing, at the same time, compliance costs for taxpayers.

Traditionally, the control of these market operations rested on paper-based invoices, bookkeeping requisites, information obligations by taxpayers about their

to measure their maturity in the area of analytics. This set of products developed by the OECD could be grouped in its Tax Administration 3.0 Action Plan. See OECD, *Tax Administration 3.0—The Digital Transformation of Tax Administration* (Paris, 2020). Additionally, different data governance maturity models have been developed and could be applied to tax administrations, see, for example, CIAT, *Data Governance for Tax Administrations: A Practical Guide* (Panama City, 2022).

102 Available at https://blogs.iadb.org/gestion-fiscal/en/digital-maturity-index-how-to-measure-digital-transformation-progress-in-tax-administrations/.

103 More information may be found from TADAT performance assessment reports at https://www.tadat.org.

104 See https://www.pefa.org/sites/pefa/files/PEFA%202022%20Stocktaking%20-%20B07.pdf.

transactions, analogic auditing of this information and control of points of sale. Innovations that digitalized the registration of transactions and its transmission to tax administrations have the potential to transform the administration of the VAT radically, improving both taxpayer experience and the capabilities of tax administrations. In this section, we will review the different options available, including e-invoicing, e-reporting, digital cash registers, products and services classification, e-solutions for e-commerce and low-value imported goods taxation, and others.

3.1. Goals, technologies and options

The first thing to take into account is that there is a nominative or terminological debate around the different innovative technologies that have been introduced to facilitate digital recording of transactions, which allows the transition from paper-based invoicing systems to electronic invoicing and how to use it all for better tax administration.[105] This debate runs parallel to the diverse trajectories and country experiences during this journey, adapting each of the systems to their own restrictions, business environment and legal framework. The approach in this guidance is not going to focus on solving this debate, nor to advocate for a one-size-fits-all solution, but to highlight desirable goals and, according to them, raise the options available to help each country to design its own national strategy.

The starting point of the use of new technologies to improve the administration of VAT is to get access to the information on the transactions of sellers and buyers in a reliable and timely way, minimizing compliance costs, promoting voluntary compliance and making compliance easier to control and enforce when needed. To reach these goals, the implementation of a technological system that provides a digital identification and electronic validation or signature of the subjects involved, tamper-proof digital register of transactions and secure digital communication of the information is recommended. Currently, three options that are not necessarily mutually exclusive, are being implemented. Departing from the point of view of tax administration, these options may be labelled, for the sake of explanation, as: e-invoicing, e-reporting and digital cash registers.

In an e-invoicing system, taxpayers are required to issue a structured (according to a machine-readable standard) e-invoice with a specific format established by the authorities and the e-invoice (or a set of data from it) must be transmitted to the tax administration.[106]

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105 See, for example, OECD, *Tax Administration 3.0 and Electronic Invoicing: Initial Findings* (Paris, 2020), pp. 13–14. The results of the survey quoted in this paper show that even if the majority of tax administrations identify the e-invoice with a structured data set allowing for automated digital data processing, many of them still indicated that images of paper documents, like PDFs, could be considered to be an e-invoice.

106 This terminology can be found in Alberto Barreix and Raul Zambrano, eds., *Electronic Invoicing in Latin America: English Summary of the Spanish Document* (CIAT and IDB, 2018); and Giacomo Luchetta, and others, *VAT in the Digital Age: Final Report. Volume 1, Digital Reporting Requirements*, (Luxembourg, Publications Office of the European Union, 2022).

These would be its basic characteristics, even if the system could vary in many different aspects:

a) The set of taxpayers involved, on a voluntary or mandatory basis.

b) The format of the e-invoice.[107]

c) The way in which it is issued (web services provided by the tax administration and or private authorized services) and "travels" from the seller to the buyer, and to the tax administration (with or without previous authorization or clearance).

d) The moment in which the tax administration receives the information (prior to its issuance, as it takes place, or shortly thereafter).

E-reporting could be described as any digital reporting system that does not require the existence of a predefined e-invoice (even if this e-invoice could exist in some systems, especially if it is considered an invoice using a broad definition of one, including unstructured ways like PDFs, digital images, scanned paper invoices, etc.) but focuses on establishing the obligation to digitally transmit a set of data of the transactions relevant to the tax administration, periodically or in real time.

Digital (or electronic) cash registers are the evolution of traditional cash registers that began to be used for tax control purposes of the points of sale (under different names as fiscal registers or fiscal printers). They evolved to include a device where each and every sale is registered in a way that digitally identified the seller and the details of the transaction, in a way that cannot be erased, and that is accessible to the tax administration, even, in the most advanced systems, online and in real time.

All the options offer tax administrations the possibility to access better and faster information for VAT management and control, but differ in the degree of information collected and the implementation process, as well as in the complementary advantages that could be associated with them.

The e-invoicing system would provide the maximum amount of information while minimizing the possibility of errors,[108] as the information contained in the invoice will be transmitted automatically to the tax administration and the document is the same for seller, buyer and tax administration. At the same time, the implementation of the system may foster digitalization and innovation of the economy and businesses in

107 The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) cross-industry invoice (CII), the OASIS Universal Business Language (UBL), (International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC)19845:2015) International Standard, and the European standard on e-invoicing (EN 16931) which was developed and published by the European Committee for Standardisation (CEN), are among the standard formats used (OECD, *Tax Administration 3.0 and Electronic Invoicing: Initial Findings* (Paris, 2022)), but many countries have adapted and developed their own formats to domestic requirements and legislation as stated in CIAT and IDB, *Electronic Invoicing in Latin America (2018).*

108 Always depending, of course, on the validation rules applied to the process of e-invoice issuing.

general, encouraging the adoption of better business management processes, increasing information technology (IT) capacity, promoting digital innovations such as electronic signatures, facilitating the standardization of electronic relationships among businesses and customers and the e-commerce in general, and minimizing the use of paper. Once implemented, the system would reduce compliance costs (decreasing invoice processing costs and processing errors, allowing the removal of other burdensome tax reporting and compliance regimes, etc.) and foster formalization. The information collected could be used to provide further services, as we will explore in the next sections.

E-reporting systems do not require changes in legislation and business practices on invoicing and could provide timely basic information needed for tax administration and compliance purposes. On the other hand, this option does not offer (at least not at the same degree) the other advantages enumerated for e-invoicing.[109]

Finally, digital cash registers focus only on the retail stage and require an additional investment in hardware. Consequently, their potential to improve VAT administration and provide additional advantages and services have a more limited range. This was the first system introduced in most countries and it could be used simultaneously with the others, despite the fact that when the use of e-invoicing systems in the retail sector and business-to-consumer (B2C) operations reaches its maturity, it could lead to its substitution.

The choice among the above-mentioned options to improve control and information on commercial transactions and VAT administration is affected by the particular circumstances of each country, including their degree of technological maturity, business environment and legal framework, and on whether they approach their goals by using short-term solutions or medium and long-term strategies.[110] The next section provides more information on implementation and country experiences to help evaluate the best scenario for each country.[111]

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109 In case the authorities plan to move to an e-invoicing system in the future, the potential duplication of efforts should also be taken into account.

110 Along with the technical considerations, attention should be given to collaboration with the private sector, considering, for example, the ICC (International Chamber of Commerce) set of Practice Principles for the Implementation of Continuous Transaction Controls (available at https://iccwbo.org/news-publications/policies-reports/icc-continuous-transaction-control-ctcs-practice-principles/#single-hero-document). These principles aim at considering the need for balance between the legitimate interests of tax collection and economic growth, ensuring efficiency and maximum benefits for both the private and public sectors ('Provide data only once' principle, consistency, interoperability, harmonization, robustness and continuity), communicating a holistic and long-term strategy embedded into a broader strategy of the digitalization of the public administration, stimulating cooperation, facilitating possible changes, providing data protection and privacy, and ensuring non-discrimination, as well as considering and minimizing trade impacts.

111 From the international perspective, some degree of harmonization should be encouraged and promoted in order to reduce compliance costs.

Another specific area where technological innovations are fundamental to improving VAT compliance and administration is e-commerce of digital goods and services and low-value imports of goods. The global policy dialogue organized by the OECD identified internationally agreed rules and mechanisms that allow governments to secure important VAT revenues on e-commerce and ensure a level playing field between e-commerce and traditional businesses, without stifling innovation and economic growth.[112] Of particular relevance in the context of this technology-oriented report is that the recommended rules and mechanisms promote the design and implementation of a simplified registration and collection regime via a secure, user-friendly online portal through which non-resident suppliers and digital platforms can register for VAT and manage their VAT obligations. The development of an IT infrastructure for a simplified VAT compliance regime could be done by the tax administrations themselves or they could resort to digital solutions developed by other entities.[113] Over 90 jurisdictions around the globe have implemented VAT reforms directed at digital trade based on these recommended approaches.

3.2. Available approaches to implement a national strategy

Given the already cited ambiguous use around the world of some terms that define the strategies previously discussed, it is not easy to synthesize the overview of its implementation. Fortunately, we can resort to ISORA for a sufficient approximation. Following the overview published by the Inter-American Center of Tax Administrations (CIAT)[114] and based on ISORA, the implementation of e-invoicing and its requirement as a mandatory tool for recording sales and other transactions is one of the most important innovations in the fight against tax fraud. Of all the countries in ISORA, 36.8 per cent of them have a mandatory electronic invoicing system for some or all taxpayers registered by their respective tax administrations. CIAT countries lead, by groups of countries, in the degree of adoption of this tool with 50 per cent of the total, while in Latin America and Caribbean (LAC) region, this percentage reaches 39.4 per cent (figure 2). Unlike most technological innovations for tax management, the implementation of electronic invoicing is not led by high-income countries (25.9 per cent), since its dissemination and incorporation are currently

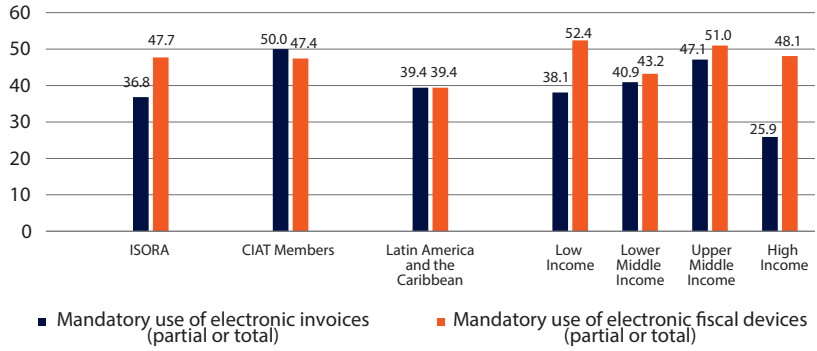
112 Further guidance on the design and implementation of these rules and mechanisms can be found in the *VAT Digital Toolkit for Latin America and the Caribbean, VAT Digital Toolkit for Africa and VAT Digital Toolkit for Asia-Pacific* developed by the OECD and other regional partners.

113 As the Digital Economy Compliance (DEC) software, developed by CIAT with the support of the Norwegian Agency for Development Cooperation (NORAD). This open source and free software offers a simplified voluntary mechanism for registration, declaration, payment and communication of companies operating without a physical presence in a country (available at https://www.ciat.org/the-dec-tool-digital-economy-compliance-tool-adds-new-functionalities/?lang=en). Aligned with the OECD VAT toolkits, DEC completed its implementation in Bolivia, Guatemala and Nigeria, and it is planned to be implemented soon in the Dominican Republic, Honduras, Panama and five Pacific Islands

114 Carlos Garcimartín and Santiago Díaz de Sarralde, *Overview of Tax Administrations in CIAT Countries. Results of ISORA, 2022* (Panama, CIAT, 2024).

more intensive among middle-income countries (40.9 per cent for lower-middle income, 47.1 per cent for upper-middle income). Looking ahead, e-invoicing seems to continue to be a higher priority for lower-income countries, given its potential as an instrument for reducing tax evasion.

Figure II: Mandatory use of electronic invoices and fiscal devices. (2021 data, based on 2022 ISORA survey)



Source: Garcimartín and Díaz de Sarralde (2024).

Other techniques, aimed at the same objective of improving levels of voluntary compliance, are represented by the requirement by tax administrations for taxpayers (sellers of goods and services) to record their transactions through the use of electronic fiscal devices or duly certified cash registers. In ISORA, this practice is observed in almost half of the cases, while in CIAT, in 47.7 per cent, with relatively similar values for other groups of countries according to income level (table 2).

The implementation of national systems of e-invoicing in Latin-America[115] is a well-known trend. Early adopter and leader countries in the use of the technology, reducing compliance costs and tax fraud, include Chile (2003), Brazil (2006), Mexico (2005, 2011)[116] and Argentina (2006), with adoption levels close to a hundred per cent of all registered invoice issuers, followed closely by Ecuador (2016), Uruguay (2012) and Peru (2016) which have significantly expanded the number of issuers and documents, with only small taxpayers still using paper-based invoices.

115 CIAT and IDB, *Electronic Invoicing in Latin America* (2018); and Raul Zambrano, "Electronic invoicing in Latin-America", in *Applying New Technologies and Digital Solutions in Tax Compliance,* Articles from presenters of the IOTA Annual Conference—Tax Compliance Technology Showroom (Budapest, Hungary, Intra-European Organisation of Tax Administrations (IOTA), 2020), p. 19.

116 Some countries, like Bolivia, Colombia, México and Ecuador, changed their models along these years to solve different problems (low scale of adoption, low quality of information and technological problems).

Table 2: Mandatory use of electronic invoices and fiscal devices (2021 data, based on 2022 ISORA survey)

Country Groups	Mandatory use of electronic invoices (partial or total)	Mandatory use of electronic fiscal devices (partial or total)
ISORA	36.8	47.7
CIAT Members	50.0	47.4
Latin America and the Caribbean	39.4	39.4
Low Income	38.1	52.4
Lower Middle Income	40.9	43.2
Upper Middle Income	47.1	51.0
High Income	25.9	48.1

Source: Garcimartín and Díaz de Sarralde (2024).

In recent years, other countries have joined the club: Colombia (2018) put in place a new operational framework implementing a pre-clearance model, supported by a cloud-based application hosted by the tax administration, that reached mandatory level for all large taxpayers by the end of 2019; Costa Rica (2017) went into full production, establishing a mandate for all taxpayers to use the system, currently handling over a hundred million documents per month; Guatemala (2018) implemented a new operational model that replaced the old GFASE-based model with one that would match the trend elsewhere in Latin-America where all documents are transmitted to the tax administration; the Dominican Republic (2019), Panama (2018) and Paraguay (2018) started their own systems with all three countries conducting and successfully concluding their pilot projects and geared for general production in a voluntary phase; Bolivia, El Salvador, Cuba and Honduras have ongoing projects for the development and adoption of their own national systems.

It could be said that the adoption of e-invoicing in Latin America has created a snowball effect and is now regarded as a symbol of modernity. Even with different clearance models and roles of private solutions, e-invoicing in this area is, without exception, a national project, written, directed and co-starred by the tax administration. The tax administrations receive all invoices issued by taxpayers, with the e-invoices containing all the information of the registered operations and can be used by taxpayers only after being cleared by the tax administration. In most European and Asian countries, e-invoice involves basically only companies and their mutual relationship, and the tax administrations only receive an extract of the information registered on the invoices.

The Latin American experience allows us to draw some valuable lessons on how to structure the process, taking into account different elements such as technology, stages of implementation, taxpayers involved and communications strategy.

A prerequisite is to assess the adequacy of the infrastructure of the tax administration, capacity of service by solution providers and adequacy of the communication infrastructure. After this, tax administrations need a well-defined pilot phase (including big companies and problematic sectors, and ideally a whole supply chain, but keeping it small in terms of the number of taxpayers involved). Usually, the main difficulties are not strictly technological, but related to the adaptation of companies' invoicing processes. If the pilot phase is successful, the voluntary adoption phase can be launched, always giving enough time in advance for all sectors to adapt to the new regulation. During this phase, it is essential to be prepared for bottlenecks (and if needed, to limit the access to the system in order to avoid overloads). There is no rule for the duration of this phase. In Brazil, it took less than two years, while in Chile, it took more than 10 years. One conclusion is unanimous though—without mandatory rules, there are a number of companies that will not become users of the system for many different reasons, among them blurred benefits and difficulties managing change, unclear or very complex laws, unfavorable cost-investment ratios and lack of knowledge.

Before the mandatory phase, it is important that extensive publicity is done ahead of time, opening the production environment for all taxpayers reached by some legal obligation on the same date that this obligation begins, and preparing the test environment ahead of this date. Extra care must be taken with the starting dates of implementation, avoiding critical commercial and accounting periods.

Throughout all these phases, each period needs to be long enough for both for taxpayers and the tax administration, always taking into account its impacts on the invoicing systems of businesses, which are at the core of their commercial relationships with customers and suppliers.

Regarding the taxpayers involved, different considerations should be made for business-to-business (B2B) and (B2C) companies. In the B2B sector, when a company is obligated, its entire sector should ideally be reached at the same time. If the definition of a threshold cannot be avoided[117] in terms of the size of the company (expressed by turnover) that separates those who need to adopt the system, it could be reduced every year to make the extension automatic. All establishments of a company should be included simultaneously, and companies involved should completely stop using paper invoices.[118] Of course, the start of implementation must be announced sufficiently in advance and some sectors could be left out, for pragmatic reasons, such as semi-industrial activities executed by artisans or individual farmers and fishers.

Normally, taxpayers who operate only on B2C operations comprise around 80 per cent of the total number of VAT taxpayers, with the total number of invoices issued on B2C operations eight to 10 times greater than the number of invoices issued on

117 Thresholds are always problematic in terms of design and implementation.

118 The acceptance of e-invoices must be universal.

B2B operations. This makes the mandatory phase for B2C taxpayers an important and difficult step, where simple and free technological solutions are essential. Most taxpayers are small and medium businesses, making it very likely (depending on national VAT legislation) that below a threshold of economic size, there will not be mandatory use, and other solutions will have to be considered (special tax regimes, cash registers, points of sale controls, etc.).

In general, it should be taken into account that, even if sometimes unavoidable, segmentation of e-invoicing implementation by economic sectors or business size could increase complexity, and the goal is to minimize the coexistence of different invoicing regimens.

Finally, the communication strategy is a cornerstone of the process. It should go much deeper than a generic information campaign and include a clear roadmap of the tax administration's plans; an extended general message;[119] the creation of an "e-Invoice Brand" and a visual identity; the establishment of channels for consultation between the government, professionals and taxpayers; and the dissemination of specific messages for tax professionals and information and communications technology (ICT) professionals.

Another geographical area where technological innovations are recently transforming the way tax administrations are tracking commercial transactions to improve VAT compliance is the European Union.[120] On 8 December 2022, the European Commission proposed a series of measures to modernize and make the European Union VAT system work better for businesses and more resilient to fraud by embracing and promoting digitalization.[121] Among other reforms, the EU is promoting a move to real-time digital reporting based on e-invoicing for businesses that operate cross-border in the region. The new system introduces real-time digital reporting for VAT purposes based on e-invoicing that will give Member States the valuable information they need to step up the fight against VAT fraud, especially carousel fraud. The move to e-invoicing is intended to help to reduce VAT fraud and bring down administrative and compliance costs for EU traders. It also facilitates existing national systems to converge across the EU, mitigating possible distortions of the competition, and paves the way for Member States that wish to set up national digital reporting systems for domestic trade in the coming years.

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119 This message must be adapted to the country´s idiosyncrasies and the characteristic of the system implemented. For example, if the adoption of e-invoicing is a free choice for taxpayers, as in the case of the United States of America or in most European countries, the main reason for adopting the electronic invoice should be economic, focusing on the savings to be gained by the issuer.

120 See the European Commission, "VAT in the Digital Age (ViDA). A proposal to modernize and improve the EU's VAT system" (Directorate-General for Taxation and Customs Union, 2022). Available at https://taxation-customs.ec.europa.eu/taxation-1/value-added-tax-vat/vat-digital-age_en#:~:text=On%208%20December%202022%2C%20the,by%20embracing%20and%20promoting%20digitalisation.

121 It has to be taken into account that this is an area of continuous evolution, and the European Union is looking to harmonize some requirements across the region.

The country level developments in the European Union are subject to a specific legislation. As it is highlighted in *Tax Administration 3.0 and Electronic Invoicing: Initial Findings* by the OECD, there is no explicit option available for Member States to introduce mandatory e-invoicing requirements as a means to ensure the correct collection of VAT and to prevent VAT fraud. As a consequence, if a Member State wishes to introduce mandatory e-invoicing requirements, it must do so by requesting a derogation from Article 395 of the VAT Directive, which is subject to the unanimous agreement of the Council based on a proposal from the European Commission. The framework is different for business-to-government (B2G) transactions. According to Directive 2014/55/EU, Member States must require public administrations to accept structured e-invoices compliant with the European standard. Although not explicitly provided by the VAT Directive, the Member States may voluntarily impose a domestic obligation to use structured e-invoices for business to government (B2G) transactions (European Commission, 2022). In this context, different country strategies have been developed, most of them focusing on e-reporting schemes that do not require the generalization of e-invoicing for B2B or B2C operations.[122]

Beyond Latin America and the European Union there are also other significant experiences in the implementation of e-invoicing. For example, the Zakat, Tax and Customs Authority of the Kingdom of Saudi Arabia (ZATCA) very recently introduced Fatoora, its e-invoicing system, through one of the fastest implementation experiences.[123] The State Taxation Administration (STA) of China is also vigorously stimulating the use of electronic invoices. On 1 December 2015, China started to promote electronic VAT general invoices nationwide, and introduced electronic VAT special invoices for new taxpayers on a pilot scale on 1 September 2020.[124] In general, e-invoicing is steadily spreading across Eastern Europe and Asia.[125]

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122 See, for example, the developments in Spain (Immediate Supply of Information, 2017) or Hungary (Online Invoicing System, 2018), while Italy and Greece are closer to an e-invoicing system (OECD, Tax Administration 3.0, (Paris, 2022)). Middle East and North African (MENA) countries are also undertaking initiatives in these areas.

123 Details of the system and its implementation can be found at https://zatca.gov.sa/en/E-Invoicing/Pages/default.aspx and in the presentation at the 4th Belt and Road Initiative Tax Administration Cooperation Forum (BRITACOF) available at https://www.britacom.org/ebook/4rd_britacof/mobile/index.html, Presentations, Session 5.4·

124 BRITACOM Secretariat, "A study of China's tax environment (2016-2020)", in *Best Practice of Selected Jurisdictions on Improving Tax Environment* (Beijing, 2023), pp. 11–38.

125 See, for example, information on recent advances in Eastern Europe https://blog.groupseres.com/en/whats-new-in-e-invoicing-in-eastern-europe and in Asia https://blog.groupseres.com/en/recent-advances-in-e-invoicing-across-asia. Especially relevant are some experiences to expand the use of electronic documents to international transactions, such as the Belarus-Russia electronic shipping documents exchange project: Belarusian Telegraph Agency, "Second stage of Belarus-Russia electronic shipping documents exchange project launched", 21 June 2021, available at https://eng.belta.by/economics/view/second-stage-of-belarus-russia-electronic-shipping-documents-exchange-project-launched-141019-2021/.

Finally, the approach based on electronic online cash registers has been summarized in OECD (2019). This report provides insights and lessons learned by looking at the broader picture with regards to electronic cash registers, and the factors that tax administrations may wish to take into account when considering options; core elements of successful introduction of online cash registers, including the business case, legal framework, stakeholder management and data protection; case studies of the implementation of online cash register systems in Hungary, the Republic of Korea, Russian Federation and Slovakia; and a detailed set of recommendations and guidance for tax administrations that may wish to consider adopting and implementing online cash registers.[126]

4. Making value added tax compliance easier through technology

Thanks to new technologies, VAT voluntary compliance can be encouraged and facilitated by providing better information both to the taxpayers and tax administration. In this process, the innovations in the tracking of commercial transactions have a protagonist role, but there are also others that help to improve all stages of the tax cycle. The next subsection will summarize the potential areas to improve VAT compliance through technology, while the second subsection will focus on some relevant country experiences.

4.1. Value added tax voluntary compliance and technology

Tax administration functions are related to taxpayers' main obligations or duties, namely: registering as a taxpayer, submission of returns within the required terms, timely payment of tax obligations and accuracy and completeness of the returns submitted. Based on these obligations we can identify the areas where technology can help tax administrations to promote voluntary compliance, namely in taxpayer registration and identification; taxpayer services; returns, payment and refunds processes; and dispute prevention tools.[127]

A good international practice is the automation of the registration process (and its modification) in the taxpayer registry file. This can be done by means of a flexible

126 It is also worth looking at the experience of the European countries that are implementing these systems, like Poland, see https://www.gov.pl/web/finance/fiscal-cash-registers; Croatia, see https://www.porezna-uprava.hr/HR_publikacije/Prirucnici_brosure/FiskalizacijaWEB.pdf.; or Belarus.

127 CIAT, *ICT as a Strategic Tool* (Panama City, 2020), section 2. Concerning dispute resolution, the European Union experience should also be considered. European Union businesses that encounter VAT issues in the Member States can use SOLVIT, an online tool coordinated by the European Commission that helps solve problems associated with misapplication of European Union legislation by public authorities without resorting to legal proceedings. SOLVIT centers, which have to provide real solutions to problems within 10 weeks, are located in every Member State. This service is free of charge. For more information, see https://ec.europa.eu/solvit/index_en.htm.

procedure in the "virtual office" of the tax administration where the taxpayer's identity is verified through the use of an advanced electronic signature, without the need for physical presence in the offices. Alternatively, it may be done through common interfaces with other government agencies involved in this process. In some cases, physical presence is limited to the capturing of biometric data at the headquarters of the tax administration.

Additionally, the registration file may include a module referred to as the "taxpayer obligations management" section containing information on each taxpayer entity's tax obligations (e.g., filing requirements), which are based on the taxpayer's economic, entrepreneurial or professional activities, the taxpayer's profile or rules associated to specific regimes. Also known as the "fiscal vector," this module may inform and make available online the frequency and filing dates according to each taxpayer's different obligations (deadlines for submitting the returns, dates for making payment, dates for filing information returns, etc.). At the same time, registration should activate a secure digital channel to deal with correspondence between taxpayers and tax administration, in substitution of physical mail addresses and incorporating the possibility of uploading the data files required for tax management.

Assistance to the taxpayer is essential for increasing the levels of voluntary compliance. The base of the tax compliance pyramid consists of a large number of taxpayers that require maximum assistance from the administration with all types of services and assistance channels.

The complexity of tax rules, the obligation to provide timely, truthful and reliable information to taxpayers and adapt services to each taxpayer segment's needs are major challenges for tax authorities. These challenges can be met by the upsurge of information and communication technologies, which offer taxpayers a wide range of possibilities for interaction.

Today, tax administrations count on a number of channels in order to provide service to the taxpayer. Among these are the traditional telephone assistance centers and face-to-face channels that can now be complemented with the tax administrations' web page, 24/7 virtual office services, mobile telephone applications, electronic mailboxes, virtual assistants and chatbots guided by AI, and "Frequently Asked Questions" systems. Add to this the frequent use of social media networks by tax administrations to disseminate messages, interact with taxpayers, receive recommendations and feedback.

In the tax return filing stage, in addition to the information and service innovations, technology can help reduce compliance burden by offering pre-filled tax returns and digital channels, in particular, for small taxpayers.[128] All tax administrations are on the path to become paper-free organizations offering (or even making compulsory)

128 Big companies, especially those quoted on stock markets, face strict accounting and internal control rules to allow periodic closing of books and proper information of shareholders. Pre-filled tax returns, at least partially, are considered an exogenous data set which creates a new need for reconciliation with the accounting books.

multiple options for online, digital or electronic tax return filing, saving time and reducing errors in the transcription. At the same time, improvements in the availability of commercial transaction data, thanks to e-invoicing and e-reporting systems, is making it possible for tax administrations to offer taxpayers VAT pre-filled returns and reduce some redundant information obligations, especially for small and medium enterprises (SME).[129] Complementing digital tax return channels, tax administrations are now able to offer a wide range of digital payment options, namely online, embedded in the tax return software or through mobile devices. Ideally, these digital interfaces should offer the possibility for taxpayers to be able to request for the extension of payment deadlines or modify payment arrangements, always according to national legislation.

A key element to improving VAT management is ensuring the certainty and speed of refunds. The business sector actively collaborates in the collection of VAT, so it is imperative for them to receive refunds, when qualified for them, in a timely manner. The improvements in information available to tax administration thanks to the innovations explained in the previous section (e-invoicing, e-reporting) should be used to speed up refunds without risking an increase in tax fraud.[130]

Additionally, digital innovations are key to dispute prevention. Tax administrations with access to real-time information on commercial transactions and the capability to analyse them can detect, in advance, possible errors or discrepancies in relation to tax returns. After validating them, avoiding rising and unnecessary information requests that could increase compliance costs, tax administrations may contact taxpayers in the context of a cooperative compliance framework to review their returns voluntarily and correct them, or clarify the misunderstanding in a cooperative way, before triggering enforce collection and judicial dispute resolution procedures. At the same time, the use of digital communication channels could be used to substitute, with all the legal safeguards, physical meetings, saving time and money for both sides.

As it has been highlighted previously, e-commerce of digital goods and services and low-value imports of goods is a specific area where technological innovations are fundamental to improving VAT compliance and administration. Even if this is not a topic that is going to be discussed in depth in this paper, it is worth pointing out that, according to international standards and best practices, when implementing the channels to make non-resident enterprises or the platforms or marketplaces used by the buyers responsible for VAT collection, declaration and payment have a significative potential to foster voluntary compliance. In the case of what is sometimes called collaborative economy, where non-resident platforms work as middle agents

129 For bigger companies accurate, pre-filled VAT returns could be more difficult to generate, due to the complexity of their operations, among other reasons.

130 In Belarus, for example, the mandatory e-invoicing system is crucial to obtaining VAT refunds in a timely manner. The supplier submits an e-invoice through an online portal, and the buyer has to verify and accept it (which creates two levels of controls over invoices, by the businesses involved in a supply chain and tax administration). When the buyer submits a VAT refund claim, tax officers compare the information in the VAT return with the "balance" on the online portal and allow the refund only if they match.

between supply and demand for goods and services in the national jurisdiction (such as secondhand markets, tourist apartment rentals, transportation, etc.), receiving information on transactions from these platforms could be the key to reducing informality and tax fraud in these sectors.

Finally, the quantity and quality of information available to tax administrations on commercial transactions may be used to offer a whole new set of services to taxpayers and the society in general. This could include e-invoice factoring, statistics, studies of goods and services, final consumer price comparatives and others. These new services will be summarized in the next section.

4.2. Overview of country experiences and case studies

Tables 3 to 5 offer an overview of the degree of implementation of new technologies to improve tax compliance, in the world and across the countries, grouped by income level.

ISORA provides detailed information about the different registration channels available to taxpayers. The results highlight that face-to-face (in-person) registration is still the most used method in the countries surveyed (87.9 per cent), even though the availability of digital channels (online or through applications) has grown significantly compared to paper registration by postal mail (65.5 per cent of the countries that offer the computerized alternative, compared to 43.1 per cent for paper). By income level, there are large differences in the adoption of these new online technologies, with 88.9 per cent of high-income countries adopting them, far beyond the 38.1 per cent of low-income countries.

Table 3: Taxpayers´ Registration Channels (2021 data, based on 2022 ISORA survey)

	Taxpayers´ Registration Channels (% of countries where available)					
Country Groups	**Online**	**Telephone**	**Email**	**Mail/post**	**In-person**	**Other**
ISORA	65.5	37.4	48.9	43.1	87.9	30.5
Low Income	38.1	19.0	23.8	28.6	81.0	33.3
Lower Middle Income	50.0	34.1	54.5	34.1	90.9	29.5
Upper Middle Income	70.6	37.3	51.0	37.3	94.1	31.4
High Income	88.9	50.0	55.6	64.8	88.9	31.5

Source: ISORA

Table 4 shows the percentage of usage of different communication channels. In recent years, use of digital channels (online, e-mail and digital assistance) has been increasing in many countries, even before the outbreak of the COVID-19 pandemic which

accelerated the movement towards non-face-to-face digital-based communication and interaction solutions with the taxpayer. This set of digital options is now the main channel of communication for taxpayer services, followed by phone/postal mail and in-person channels. By income level, it is confirmed that digital and traditional non-face-to-face channels (telephone/postal mail) are used more intensively by higher income countries, while the face-to-face channel (in-person) reduces its degree of use as the income of the countries analysed increases.

Table 4: Services and new technologies. (2021 data, based on 2022 ISORA survey)

Country Groups	**Service channels** (in % of incoming contacts)			**Application programming interfaces** (APIs) (%)	**Digital identification technology** (%)	**Virtual assistants** (e.g. chatbots) (%)
	Online/Digital Assist./E-mail	**Phone/ Mail**	**In-person**			
ISORA	41.9	39.9	18.1	72.4	29.3	43.7
Low Income	33.8	23.9	42.3	71.4	19.0	28.6
Lower Middle Income	35.3	40.3	24.4	72.7	25.0	36.4
Upper Middle Income	42.8	37.4	19.8	58.8	31.4	41.2
High Income	46.6	43.8	9.5	87.0	37.0	61.1

Source: ISORA

In this field, the introduction of application programming interfaces (APIs) stands out for its importance and diffusion. APIs allow secure digital interaction between revenue systems and external applications in banks, accounting software providers and other government agencies, and can be used to send and receive information, validate activities and facilitate operations. In this area, 72.4 per cent of ISORA countries have this technology (in use or in the implementation phase). Digital identification technologies (e.g., biometrics, voice identification) have also had an acceptable diffusion among the different countries, with usage reaching 29.3 per cent among surveyed countries, with implementation growing higher with the level of income. Finally, virtual assistants (e.g., chatbots), are already in use or are in the implementation phase in 43.7 per cent of the total number of countries included in the survey (174), with high-income countries having an outstanding implementation rate of 61.1 per cent.

As for returns filed through electronic channels (aggregating their different possible modalities), the overall averages for ISORA are 72.8 per cent for corporate income

tax (CIT), 79.2 per cent for personal income tax (PIT) and 68.5 per cent for VAT (table 5). The differences by income level are clear: electronic filing is below 50 per cent for all taxes in the group of low- income countries, and 87.2 per cent (CIT), 90.9 per cent (PIT) and 80.3 per cent (VAT) for high-income countries. On average, 49.4 per cent of the countries reported offering pre-filled tax returns for at least for one of the main taxes (PIT, CIT or VAT). The use of this technique to improve and facilitate voluntary compliance shows a clear increasing pattern according to the income level of analysed countries.[131] The relative proportion of tax payments through electronic channels reached a global average in ISORA of 68.8 per cent if the number of payments is taken into account, and 75.5 per cent if their economic value within the total collection is considered. By income level, the gap between the different groups of countries is still evident, with average e-payment values growing with income level, with 51.3 per cent of the amount and 69.3 per cent of the value of payments received in low-income countries, compared to 79.1 per cent of the amount and 79.4 per cent of the value of payments for high-income countries, even if the gap has been closing quickly after the pandemic.

Table 5: E-filling, Pre-filling and E-payment. (2021 data, based on 2022 ISORA survey)

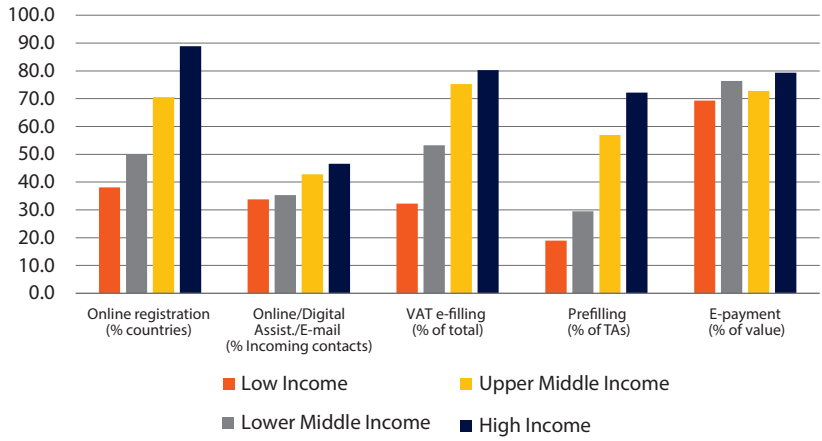
Country Groups	**Electronic filling rate** (in % of total)			**Tax administration pre-fills returns or assessments**	**Electronic payment proportion** (in %)	
	CIT	**PIT**	**VAT**	**% of Tax administrations**	**Amount**	**Value**
ISORA	72.8	79.2	68.5	49,4	68.8	75.5
Low Income	36.0	48.4	32.3	19.0	51.3	69.3
Lower Middle Income	64.9	64.8	53.2	29.5	67.0	76.4
Upper Middle Income	72.2	80.2	75.3	56.9	63.1	72.8
High Income	87.2	90.9	80.3	72.2	79.1	79.4

Source: ISORA

Figure III summarizes the differences in the implementation of new technologies depending on the level of income.

131 In most cases pre-filling is used for personal income tax purposes, while experiences in the field of corporate income tax and VAT are scarce and more recent. Some significant experiences will be quoted later on in this paper, for example, the implementation of VAT pre-filled tax returns in Chile.

Figure III: Technology innovations by level of income (2021 data, based on 2022 ISORA survey)



Source: ISORA.

It is worth highlighting that tax administrations, particularly those with solid and stable e-invoicing systems, are using the new data in different and innovative ways to provide new services. A few examples of its usage would be:[132]

— Brazil, besides using its e-invoicing data to track the economy in real time on a sectoral basis, has developed the Public System of Digital Accounting (SPED[133]), which has become the only channel between businesses and tax administrations. This system includes modules for electronic invoicing, digital bookkeeping and digital tax records, among other projects.

— Also in Brazil, new Internet applications that use the e-invoice's databank has two uses that improve the information, enhance transparency and therefore boost market efficiency on the demand side: The first is price consultation applications that businesses have for the final consumer; and the second, is the setting of maximum prices to be accepted in public procurement. For price consultation applications, the data on the electronic consumer invoice (corresponding to purchases of final goods) is used as an input. Consumers thus have information on the prices of goods and can identify the most suitable. This application has been developed in the states of Piauí, Amazonas, Espírito Santo, Rio

132 CIAT and IDB, *Electronic Invoicing in Latin America* (2018) and Raul Zambrano, "Electronic invoicing in Latin-America".

133 Available at http://sped.rfb.gov.br/.

Grande do Sul[134], and Paraná[135], with the latter deemed to have the best model according to the State. More specifically, e-invoices have become a pillar of clarity for the price of important goods in free markets, such as for fuels or intermediate products (for example, construction supplies) which are important because they are for mass consumption. As for maximum prices in public procurement, note that the e-invoice databank makes it possible to view product details and the quantities sold, so users are able to compare the prices of similar products and secure the best deal for the State. The States of Amazonas, Bahia and Río Grande do Sul[136] use this application.

— In Ecuador, the traceability of the e-invoice has allowed identification and analysis of value added and market composition and the percentage of Ecuadoran goods and services in production chains for a series of economic sectors, complementing other sources of information. This type of study has two important applications with regards to knowledge of the value chain. The first supports public policy design, identifying national production nodes and the industries with the densest chains. The second improves the impact of public investment and tax incentives, gearing them to activities with a greater national component and multiplier effect. Overall, these applications provide the tax administration a role in the process of regulation and competition, and in improving traditional fiscal policies on the design of public investment and tax incentives.

— A large-scale implementation by the Chilean tax administration for factoring electronic invoices[137] on a voluntary basis has opened access to fresh resources to a lot of taxpayers. Although the number of exchanged documents is not very high, the traded values are impressive, reaching a couple of percentage points of the gross domestic product (GDP).[138]

— Another initiative in Chile by the tax administration is the prepared input and output registries for all VAT taxpayers, lifting the requirement for them to keep the corresponding books. Additionally, the Servicio

134 See https://sefaz.es.gov.br/menor-preco-brasil-passa-ser-unico-aplicativo#:~:text=Segundo%20o%20subsecret%C3%A1rio%20de%20Estado,de%20viagens%20para%20outros%20estados.

135 Lowest Price Program of Paraná available at https://www.fazenda.pr.gov.br/servicos/Cidadao/Nota-Parana-e-Menor-Preco/Pesquisar-precos-Menor-Preco-do-Nota-Parana-dYo9jKNL.

136 Market Reference Prices for Río Grande do Sul may be accessed at https://tesouro.fazenda.rs.gov.br/conteudo/14183/precos-de-referencias-de-mercado-(prm)

137 Available at https://www.sii.cl/destacados/factura_electronica/cesion_facturas.html.

138 The tax administration of Peru (SUNAT) is also promoting e-invoice factoring through their Confirmation Platform (https://cpe.sunat.gob.pe/plataforma-de-confirmacion-del-rhe-y-de-la-fe). For more information, see https://www.ciat.org/ciatblog-factoring-and-digital-transformation-the-role-of-the-sunat-in-the-promotion-and-massification-of-this-important-financing-mechanism/?lang=en.

de Impuestos Internos (SII) has been pre-filling VAT returns since 2017, with an acceptance rate above 90 per cent of all VAT registered taxpayers. Following the trend, Ecuador started to pre-fill some fields of their VAT returns in early 2019 and more countries are currently working on joining these two countries in this trend. Spain is also using its e-reporting system Servicio de Información Inmediata (SII) to offer pre-filled VAT returns to most small and medium taxpayers.[139]

5. Enforcing value added tax compliance via tax data analysis and digital innovations

Beyond fostering voluntary compliance, new technologies may help to improve tax control and enforced compliance[140] in many areas. In a strict sense, tax control involves the examination and auditing activities (both massive, using the information already available to the tax administration to determine compliance with formal obligations and the accuracy of the returns filed, and intensive, resorting to the powers granted by the legislation to the tax administration to audit specific cases in detail), but in a broad sense it could also include tracking and checking registry errors, as well as monitoring non-filers, payment delays and debt collection efficiency.

5.1. 360-degree and real-time analysis of value added tax data

Technological innovations may help build a comprehensive VAT enforcement strategy, connecting all the possible steps and providing a 360-degree panorama of the risks map, as well as establishing interaction with the taxpayers to a real-time framework. Having access to timely, high-quality data and being able to process it, makes all the difference.

Beginning with registry, tax administrations need to check it continuously, making sure that contact information is accurate, a task that digital mailboxes or addresses can accomplish. At the same time, information on economic sector activity classification is key, and should be contrasted with the data collected on sales and purchases — specifically, what kind of goods and services are being traded — checking that this corresponds to the standard patrons of each sector. The information from e-invoicing and e-reporting systems, which includes not only quantitative but qualitative data, is essential to this process. The use of advance big data analytics and, in some cases, AI, to detect anomalies in this area allows tax administrations to pre-detect possible risks nearly in real time.

There are several challenges at the stage where tax returns are processed. There is a risk of not receiving them on time, low quality of data may be reported and there is even a reputational risk in case the tax administration does receive tax returns on

139 See https://www.lamoncloa.gob.es/serviciosdeprensa/notasprensa/hacienda/Paginas/2021/120221-iva.aspx.

140 Of course, the distinction between voluntary and enforced compliance is somewhat blurry in practice (given that tax control generates the perception of risk in the taxpayers—an important factor for promoting voluntary compliance), but useful for exposition purposes.

time but is unable to process them in a timely manner due to inefficient processes. Technology may help in mitigating these risks by migrating to e-filing to reduce flaws due to errors, illegible data and slowness in processing that are experienced when paper-based systems are used. Of course, e-filing is not free of risks. Validation rules must be implemented to prevent errors and both software and hardware have to be tested under stress to assure their adequacy (in any case, business continuity plans should be designed even for worst case scenarios such as when e-filing results are blocked for different causes). Pre-filling of tax returns using the information from e-invoicing or e-reporting will also help reduce the risks.

Tax payment risks may also be mitigated by adopting technological innovations, especially online payment channels through the tax administration´s information systems, minimizing the use of traditional options that are slower and more susceptible to errors. Again, this option involves risks (for example, insufficient funds in the account provided by the taxpayer or network failures) that should be anticipated by offering alternative ways of payment and with the implementation of ex-post controls, which leads us to the next step: tax debt collection risks.

At this stage, IT systems should allow the implementation of preventive measures, for example, sending automatic reminder messages before the upcoming maturities of payment and/or immediately following a delayed or missing payment.[141] Information systems must also be able to control debtor´s assets, establish electronic communication channels with the relevant databases and prevent asset stripping. Furthermore, new techniques for data analytics and AI are being used to improve the selection of debts in the enforcement collection phase to maximize recovery.

Tax control via auditing is incorporating new technologies to improve its efficiency too. Massive and automatic audits[142] are now possible using the tax administration´s IT systems to check tax returns for their accuracy, minimizing the use of resources and providing the taxpayers a digital channel to add new information on their tax return data. In this procedure, AI can help traditional econometric and statistical techniques to identify anomalies in the tax returns compared to similar taxpayers (clusters) and identify potential risks. When an anomaly is identified, the system triggers the request for clarification automatically.

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141 These messages should be framed using insights from behavioral economics and nudges in message design.

142 There are different auditing procedures with diverse names depending on the country. For example, the IRS (see https://www.irs.gov/businesses/small-businesses-self-employed/irs-audits#conduct) distinguishes among correspondence or mail audits (the bulk of all audits, usually a letter requesting more information or proposing an adjustment based on mismatching between tax return data and tax administration info), and in-person audits, at IRS offices ("office audit", when questions about your return are too complex or big for a correspondence audit) or at the taxpayer's office (also called "field audit", the most comprehensive and detailed, involving visiting the taxpayer at their home or place of business to examine records). When we talk about massive and automatic audits, we are focusing on the first class, correspondence or mail audits.

Given the scarce resources available for any tax administration to perform in-person audits, the use of new technologies can help prioritize, select and analyse the cases that are essential. Traditional risk assessment and case selection based on the use of statistics, series analysis and multivariate techniques (analysis of conglomerates, discriminant analysis, regressions and logistic regressions) have proven their efficiency in identifying outliers and creating red flags and score systems to measure taxpayers´ relative risks and helping to focus auditing efforts. AI should be used to help in this task. Different models are being tested on their efficiency to detect and avoid potential tax fraud, using expert systems (that combine the knowledge of experts and their decision-making rules with machine learning and data mining) and autonomous machine learning (supervised, using labeled datasets to train algorithms that classify data or predict outcomes, or unsupervised, using unlabeled datasets), and based on neural networks to process the data (with different structures of layers and feedback alignment functions, since deep learning is the most human-independent system). Additionally, social network analysis is being used to analyse complex relationships among multiple agents, identifying the main actors (nodes), the links among them (edges) and providing algorithms to measure their characteristics and help to isolate groups of agents (clusters) relevant to prevent tax fraud and visualize their activity (graphs), something essential when dealing with VAT fraud schemes.

In parallel to risk management, data management innovations are essential to performing audits, improving database interoperability, data import and analysis, search and visualization tools. They allow the capacity for receiving massive data (in different formats) from the taxpayer and integrate them with the information available at the tax administration. These innovations also provide Optical Character Recognition (OCR), web scraping, and data-mining tools which analyse written documents, internet information and big data bases, and help to understand the results better when building customized graphs.

Finally, other well-known disruptive new technologies are going to play a role in specific areas of tax administration.[143] For example, the potential use of blockchain technology in tax administration is mainly concentrated in processes involving more than two players. These private blockchains would have different players, each with a different purpose, and in which the tax administration would be only one of the players. The use of intelligent contracts, with operations and access restricted to specific players, and with the capability of limiting access of data through cryptographic techniques, open great opportunities to operate cooperation ecosystems among the different players. In the same vein, the Internet of Things (IoT) will play a role in the tax area. Devices that use IoT-based technology can automate the handling and tracking of merchandize, the management of taxes related to transit, such as the VAT, and customs management.

Nowadays, all the above-mentioned technologies, even with some confusion and overlapping over terminology, are competing with each other in terms of efficacy

143 CIAT, *ICT as a Strategic Tool,* (Panama City, 2020), p. 507–512.

and risks (with different relative advantages concerning the information given to tax auditors on the explanation of the results and new challenges on the possible biases implied in the process)[144] but there is no doubt that they will be the future of tax compliance risk management, enabling a 360-degree and real-time analysis of VAT data.

5.2. Examples of innovations on enforced tax compliance

Innovations in the use of new technologies in tax administration is an ongoing process that is extremely dynamic and continuously updating. In this section, we will provide some examples of these innovations, among many other relevant experiences. The purpose of this review is not to cover all areas, but to encourage further research in specific areas of interest to individual tax administrations.

Blockchain in tax administration. The Brazilian Federal Tax Administration (RFB) currently implements a system based on blockchain to share data from the Registry of Individual Taxpayers (CPF)[145] among institutions in the three levels of government (federal, states and municipalities), called blockchain tax file number or "bCPF". It uses a permissioned blockchain based on auditable open-source software in which only authorized institutions can participate. There are three kinds of participation: (1) participation only for using data, (2) participation for the contribution of a data field and (3) participation for the modification of data. The latter is carried out by institutions with legal prerogatives for this activity, which will be implemented by means of "intelligent contracts." Not all nodes will be active, that is, not all nodes will have copies of the database. The exchange of data of the CPF with other institutions is determined by the constitution of Brazil and the RFB currently has more than 800 valid agreements for this purpose. Thus, this application will render greater automation, security, transparency and traceability of the process, besides promoting greater quality of data from the CPF.

Use of AI to identify real state. The General Directorate of Public Finances (DGFiP) of France implemented an AI image recognition system to optimize the process of detecting undeclared constructions or developments, in order to fight more effectively against fraud and declarative anomalies in the field of real estate and update the cadastral map along the way.

Integration of big data analysis and data analytics. The tax administration of Bolivia (SIN) has digitalized all processes, from registry to taxpayer services and risk management, combining efforts to improve infrastructure, data bases and analytical tools.

Establishing a system to measure, monitor and report on taxpayer compliance in a uniform, standardized and scientific manner. The South African Revenue Service (SARS) identified the need for such a system back in 2006 and developed the Compliance Evaluation and Monitoring Information System (CEMIS). CEMIS was

144 We will go back to this issue in the last section of this paper on the ethical use of AI.

145 CIAT, *ICT as a Strategic Tool,* (Panama City, 2020), p.509.

successfully deployed in 2011 and currently houses over 10 years of compliance data. The lessons learned in the development and implementation of CEMIS served and assisted other African countries with establishing their own compliance initiatives, including, among others, Uganda, Kenya, Lesotho, Zambia and Mauritius.[146]

Identifying anomalous transactions that do not correspond to a specific economic activity in the tax administration of Chile (SII).[147] One of the major problems detected in the management of VAT is the improper use of tax credit by taxpayers. To improve the detection of such irregularities, the SII set up a system, in the proof of concept (PoC) mode, which uses AI tools (especially machine learning), whose main source of information is the electronic invoices presented by taxpayers. The main stages of the system are: 1) Cataloging products based on glosses; 2) Determination of the relationship between products and economic activities; 3) Identification of transactions that do not correspond to the specific economic activity of the buyer and 4) Generating signaling and visualizations.

Online monitoring of transit of goods. The tax administrations of Brazil developed a freight-vehicle tracking project using radio frequency integrated into the electronic tax documents related to transported goods. While the vehicles are on the move, antennas scan them each time they pass by goods-transport control units located along the highways. This allows the tax administrations to monitor the traffic of goods in real time, and the goods are matched to their respective tax documents. In addition to tax control, it is expected that the exchange of information will also help reduce the theft of vehicles and cargos. Apart from this real-time control of freight, the use of information technologies in Brazilian States has led to the simplification of companies' obligations to the tax administrations.

Machine learning-induced nudges when filing tax returns. The Spanish tax agency (AEAT) implemented a system of nudge messaging that appear to taxpayers while they are in process of reviewing their pre-filled tax return. These messages appear to taxpayers similar to others that, in the past, have manually changed similar data, resulting in mistakes which had to be adjusted by tax authorities. The nudge messaging informs taxpayers of this possibility. The selection of taxpayers is managed through a machine learning process.

Identification of false e-invoices issuers. The Chilean tax administration (SII) developed a data analytics model for early identification of false e-invoice issuers, combining data mining, big data analysis, machine learning and dynamic dashboards to identify different risk models depending on the period of activity of the taxpayers.

Implementation of electronic audits in Mexico (SAT):[148] Using all the information available at the tax administration at the beginning of 2018, Mexican tax agency SAT built a total of 74 processes, from computation revisions to cross matching. Over two million companies went through control procedures or electronic audits.

146 BRITACOM Secretariat, *Best Practice of Selected Jurisdictions* (Beijing, 2023), p. 131.

147 CIAT, *ICT as a Strategic Tool,* (Panama City, 2020), p.502.

148 CIAT, *ICT as a Strategic Tool,* p.505.

The processes include the generation of audit working papers for the audit until the preparation of reassessment notices when needed. In the latest SAT master plan for 2024[149] new technologies have been added to control activities, such as a code scanner app for the verification of the legality of a product and the implementation of graph analytics models and machine learning in audit activities.

Electronic virtual audits. Indian tax authorities[150] have moved to a completely electronic, AI driven, anonymized and team-based assessment system known as Faceless Assessment. The Spanish tax agency (AEAT) has also introduced a system of virtual tools for auditing, named VIVI (Virtual Visits).

Indonesia is investigating the potential revenue impact of new digital activities such as when social media influencers use new research tools, like data crawlers, computer vision, social network analysis and others.[151]

Machine learning and big data analytics. CIAT has developed[152] a software named e-Invoice Anomalies' Detector (e-IAD) in collaboration with Microsoft. This software can identify, select and prioritize cases of taxpayers with unusual behavior[153] by applying unsupervised machine learning models to the data of the electronic invoice, the taxpayer's registry and the tax returns.[154] The system prioritizes cases through an anomaly index, similar to a risk-ranking process, also providing descriptive statistics and graph theory visualization. The deployment in the Costa Rica Finance Ministry[155] was completed in March 2023 and the results are currently being analysed. The Guatemalan Superintendence of Tax Administration (SAT) and the Colombian Directorate of National Tax and Customs (DIAN) plan to complete its deployment before the end of 2023.

149 Master Plan 2024 may be found here https://www.gob.mx/sat/documentos/plan-maestro-2024-sat.

150 Beginning with direct taxes (Central Board of Direct Taxes). See https://incometaxindia.gov.in/booklets%20%20pamphlets/faceless-assessment-under-income-tax-act-1961.pdf.

151 BRITACOF, "Discovering tax potency in social media analytics", presentation available at https://www.britacom.org/ebook/4rd_britacof/mobile/index.html, session 5.1.

152 The CIAT Center for Advanced Analytics and Artificial Intelligence, with the financial support of NORAD, the development agency of Norway and the collaboration of experts from the member countries of CIAT.

153 For example, taxpayers with non-existent or simulated operations (suspicious invoicing), receiving income for unusual behavior or with an atypical supply network, where the volume of customers and /or suppliers is out of proportion, among many other potential anomalies.

154 1.12 billion records were processed in less than seven hours (based on 33 months of data).

155 Costa Rica provided the anonymized data from e-invoices, which was essential to develop the software in its early stages.

6. Other issues in implementing new technologies for value added tax compliance: data and its use

At the base of the use of new technologies and digitalization to improve VAT compliance is data, its governance to make it useful and safe, and the legal and ethical consequences of the techniques used in the process. Of course, this is not something exclusive of VAT or taxes in general, and covering this topic thoroughly is far beyond the scope of this section. But due to its importance, it is required at least, to mention the challenges and risks associated to the use and transformation of data. Even if interrelated, it is relevant to highlight security of information, data governance and ethical use of information, among those challenges.

Security of information.[156] The data that tax administrations and all citizens share to make the collective action possible must be protected to fulfil the social contract. To make it possible, coding (cryptography), secure client-server interaction and robust digital identity certificates are necessary but not sufficient. Besides the technological requisites, we need to keep in mind that security is a transversal process for the organizations, and tax administrations need to pay attention to the definition of clear policies, consistent practices, effective procedures and active participation of staff.[157] The establishment of an Information Security Program (ISP) requires the coordination of roles and responsibilities of information security, the alignment with the legal and regulatory requisites (including privacy and civil freedom related to information security) and the governance of the information security system.

Data governance.[158] Data governance is an organization's ability to manage the knowledge it has about its own information so that it can respond to questions such as: What do we know about our information? Where does specific data come from? Are these data aligned with our institutional policy? According to the Data Governance Institute, data governance is defined as the specification of a framework of responsibility to encourage appropriate behavior in the valuation, creation, storage, use and disposal of information. This includes the processes, roles, standards and metrics that ensure the effective and efficient use of information to enable an organization to achieve its goals. For tax administrations in particular, there are different proposals available to implement and evaluate a data governance model,[159] adjusted to their particular need in terms of privacy and data protection, transparency in management, control and auditability, responsibility and data stewardship.

156 CIAT, *ICT as a Strategic Tool,* p.316.

157 Through the establishment of an Information Security Program (ISP), whose main objectives are: coordination of roles and responsibilities of information security; guaranteeing alignment with the legal and regulatory requisites, including privacy and civil freedom related to information security; and governance of the information security system.

158 CIAT, *ICT as a Strategic Tool,* p.408.

159 Ibid.

Ethical use of data and the new technologies. Beyond legislation to protect the privacy of citizens, civil rights and a fair treatment by tax administrations, the ethical use of AI has become a hot topic. The exponential growth of the capabilities of AI and the black box nature of some of its mechanisms have led to global initiatives that aim to identify the risks and control the possible damages involved in its use. Focusing on the tax administration sphere, these initiatives will need to answer questions such as: What data are we using to train the machine learning algorithms? Are the results biased because of the data? Are there specific taxpayer characteristics that should not be used as they may be deemed discriminatory when designing, for example, audit programmes? Do we give the taxpayer enough information on the process to allow their fair defense in case of a dispute? It is impossible right now to offer clear guidelines concerning this field, but tax administrations must follow the developments closely concerning the ethical use of tax control technologies and AI in general[160] in order to be prepared to adjust their procedures.

Currently, the most relevant development is the recent European Parliament initiative to implement a set of rules to curb the risks of AI and promote its ethical use.[161]

7. Final remarks

Technology can help improve VAT compliance in many ways. But, as always, when addressing heterogeneous needs and restrictions, no solution fits all and no solution solves everything.

This paper offers an overview of the quickly evolving possibilities, presenting different options and encouraging deeper analysis by individual countries to design and adapt new technologies to improve VAT compliance, according to their particular needs, legal framework, restrictions and possibilities.

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160 Recent research has alerted on the risks associated with the use of algorithms in this field. See, for example, the Stanford collaboration with the Department of the Treasury of the USA, yielding the first direct evidence of differences in audit rates by race: Hadi Elzayn, and others, "Measuring and mitigating racial disparities in tax audits", Stanford Institute for Economic Policy Research (SIEPR) Working Paper (California, 2023); or an article on the Dutch case on biased control of childcare benefits: Melissa Heikkilä, "Dutch scandal serves as a warning for Europe over risks of using algorithms", *Politico,* 29 March 2022.

161 European Parliament, "Debate and vote on landmark rules to manage Artificial Intelligence", 12-15 June 2023. See also European Union Agency for Fundamental Rights, *Bias in Algorithms—Artificial Intelligence and Discrimination* (Luxembourg, Publications Office of the European Union, 2022).
Many other centers and institutions are researching on this topic, providing useful insights, as, for example, the Digital Regulation Cooperation Forum (DRCF) in the UK about the use of large language models (LLM) in the public sector (see: Digital Regulation Cooperation Forum, *Auditing algorithms: The existing landscape, role of regulators and future outlook* (23 September 2022)). It is also worthwhile to consult the EU Council Analysis and Research Team 2023 paper on "ChatGPT in the public sector—overhyped or overlooked?" (2023).

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