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**Encouraging Formal Invoicing and Reducing the VAT
Impact on Low-Income individuals**

by Ricardo Fenochietto and Juan Carlos Benítez

I N T E R N A T I O N A L M O N E T A R Y F U N D

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Fiscal Affairs Department

Encouraging Formal Invoicing and Reducing the VAT Impact on Low-Income Individuals

Prepared by Ricardo Fenochietto and Juan Carlos Benítez¹

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Abstract

This paper analyses and compares two different groups of tools, the first to encourage the use of invoices (or payment systems) and the second to refund the VAT to low-income individuals. The analysis contributes to the existing literature by providing a clear characterization between these two groups of tools that are too often misunderstood and offers clear guidance to policymakers on the benefits and pitfalls of them based on available empirical studies and novel data analysis. Briefly, the first group includes a set of regressive and distortive tools (such as, allowing deducting the VAT paid on personal consumption from the PIT and reducing the VAT rate for using electronic means of payments or registration), while the second group includes tools that are less distortionary and improve income distribution (tax credits and VAT rate reduction targeted only at low-income individuals). This paper also finds that allowing the deduction of personal consumption against the PIT's taxable base (i) did not impact positively the VAT revenue in Guatemala and (ii) worsens the income distribution in Ecuador.

JEL Classification Numbers: D04, D31, H24, H26.

Keywords: PIT tax credit; VAT deduction from PIT; VAT rate reduction for electronic payments; electronic invoice; VAT impact on low-income individuals.

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ACRONYMS

CAD	Canadian Dollars
CIT	Corporate Income Tax
EMEs	Emerging Markets and Developing Economies
ETR	Effective Tax Rate
FAD	Fiscal Affairs Department
GDP	Gross Domestic Product
GST	General Sales Tax
HST	Harmonized Sales Tax
LICs	Low Income Countries
PIT	Personal Income Tax
URU	Uruguay Peso
VAT	Value-Added Tax
VCR	VAT Complementary Regime

I. INTRODUCTION

1. **The Value Added Tax (VAT) has become one of the most important sources of tax revenue for developed and developing economies alike.** It is currently present in more than 160 countries worldwide, representing 26, 33, and 31 percent of total tax in-take in developed, emerging markets, and low-income countries respectively. Besides raising revenue, the VAT is an efficient and pro-growth tax as it does not distort production decisions.² These features have contributed to the VAT's popularity among tax systems in the world.

2. **Despite its advantages, the VAT's implementation is not without challenges.** Focusing in Low income Countries (LICs) and Emerging Markets and Developing Economies (EMEs), two are the main issues faced by VAT: first, non-compliance and evasion which are a source of revenue leakage;³ second, the impact of the VAT in low-income individuals. To counter these issues, governments have (i) resorted to tax policy and administration tools to foster VAT compliance and facilitate its control by encouraging the issuance of invoices and the adoption of technology to improve reporting; and also sought other measures to lessen the impact of the tax on low-income individuals by reimbursing VAT or adopting more complex but efficient transfer systems.

3. **This paper analyses the use of two different tools: the first to encourage the use of invoices or payment systems to facilitate control and the second to reduce the impact of the VAT on low-income individuals.** The first group includes: the use of the VAT paid on personal consumption, either as a credit under the Personal Income Tax (PIT) or a deduction on the taxable income subject to the PIT; incentives or tax benefits for purchases registered or paid through formal payment systems; and lotteries with prizes (or sometimes VAT rate reduction) for final consumers who request tax compliant invoices. The second group of tools aims at reducing the impact of the VAT on low-income individuals through: a PIT credit, a VAT rate reduction, or targeted transfers to low-income individuals. The analysis (i) contributes to the existing literature by providing a clear characterization between these groups of tools, which are too often misunderstood, and (ii) offers clear guidance and timely lessons to policymakers on the benefits and pitfalls of these different tools based on available empirical studies and novel data analysis.

II. TOOLS TO ENCOURAGE THE USE OF INVOICES OR PAYMENT SYSTEMS

A. The VAT Paid on Personal Consumption Creditable Against the PIT or Deductible Against Taxable Income

4. **Only a few countries allow the deduction of the total or part of personal consumption as a credit or deduction against the PIT** (e.g., Bolivia, Paraguay, Ecuador, and Guatemala, Table 1). In Bolivia, the VAT paid by final consumers is creditable against the PIT

² Empirical results confirm these advantages (see Arnold et al, 2011 and Acosta-Ormaechea and Yoo, 2012).

³ Aggravated in some countries by difficulties in enforcement due to underdeveloped tax administrations.

liability (the PIT is a VAT complementary regime, VCR). The personal allowance for employees is equivalent to two minimum salaries and the VCR rate is 13 percent. Employees may claim the VAT paid on any kind of personal consumption against their VCR liability. As some of the purchases are made from small taxpayers who, under special regimes, cannot issue VAT invoices, an amount equivalent to 13 percent of two minimum wages can additionally be creditable against their VCR liability.

5. **Paraguay allows the deduction of personal consumption of taxpayers and their dependents from the PIT base** (since the PIT was enforced in January 2014). This includes, among others, expenses in Paraguay or abroad on health, education, housing, cloth, restaurants, food, and recreation. The benefit includes personal consumption of taxpayer's family-dependents too. The rationale behind the deduction of personal consumption abroad was to deal with the resistance to the introduction of the PIT more than the use of the PIT to control the VAT.⁴

6. **In Ecuador, taxpayers may also deduct the VAT compliant personal consumption from the PIT liability, although with some limitations.** Total deductions cannot be higher than 50 percent of net taxable income or 1.3 times the threshold for the zero rate (US\$ 14,703 in 2019) whichever is lower; specific limits also apply for each kind of expense (e.g., 0.325 times the zero-rate threshold for education, food, and dwelling).

7. **In Guatemala, until April 2012 the VAT paid on personal expenses could be credited against the PIT liability of wage-earners.** Since May 2012, this tax credit was eliminated and substituted by a fixed amount of about US\$ 2,000 for the VAT paid on personal consumption, which can be deducted from the PIT base.

Table 1. Countries with VAT as a Credit or Deduction to the PIT

Country	VAT rate (%)	PIT threshold (USD)	PIT rates (%)	VAT Deduction or credit Cap
Bolivia	13	7,200	13	Credit
Ecuador	12	11,290	0; 5; 10; 12; 15; 20; 25; 30; 35	Deduction up to USD 14,703
Guatemala	12	6,275	5; 7	Deduction up to USD 2,000
Paraguay	10	17,278	8; 9; 10	No deduction limit

Source: IMF staff based on country legislation.

⁴ Although Law 6380 of September 2019 introduced some limitations (only personal consumption in Paraguay is deductible), the deductions continue being very generous.

Theoretical Analysis and Discussion

8. **This tool is intended to improve levels of individuals requesting invoices forcing sales to be recorded and taxed** (thus improving the trail of invoices and with it the tax administration's control and VAT and Corporate Income Tax (CIT) revenue). It presents two variants: allowing a credit of the VAT paid on personal consumption against the PIT or a deduction of the amount of the expense from the PIT base. From a theoretical standpoint, a PIT on comprehensive income with a credit for VAT paid would yield a combined system that taxes income with no additional tax on consumption. If a good from a registered trader is consumed, the VAT is creditable against PIT; if a good from an unregistered trader is consumed, there is not VAT, but also no credit, so theoretically, income should still be taxed.

9. **In practice, however, the differences in the design of the PIT and VAT can lead to different outcomes.** First, with personal allowances, as most PIT allow, high-income individuals pay the PIT and low-income individuals only pay the VAT; hence, this practice may contribute to the regressiveness of the tax system (which is very important in LICs and EMEs with tax systems without progressiveness, which do not contribute to improve income distribution). Thus, low-income individuals, who do not have a PIT liability, would be effectively taxed on their consumption from formal establishments and unable to credit or deduct these expenditures from the PIT. This yields a system where low-income individuals face an incentive to maximize consumption by purchasing from informal establishments.

10. **Second, by allowing the credit or the deduction of personal consumption from the PIT base, this tool is distortive.** This policy encourages current consumption, as individuals who defer consumption can incur in higher PIT liabilities. As a result, the tool could potentially reduce savings, which, in turn, has also significant negative consequences for LICs and EMEs where national aggregate savings are very low.

11. **Third, in the case of personal expenses deductible from the taxable PIT base, there is a fundamental additional problem.** Under a progressive PIT schedule (with top PIT rates higher than the VAT rate, as it is usual), the deduction will be more valuable as taxable income and marginal rates increase making the system even more regressive.⁵ In Guatemala, for instance, invoices collected by the tax administration, when the tax credit was in force, came from taxpayers with computerized system or mandated, at the time, to use electronic invoices (most of the purchases registered in these places were made by individuals with high income).

12. **Fourth, from a revenue perspective, the potential revenues that could be collected given the current policy framework is reduced.** Not surprisingly, countries that introduced this tool, have lower levels of revenue (especially PIT and VAT together) than other peers (Table 2). By

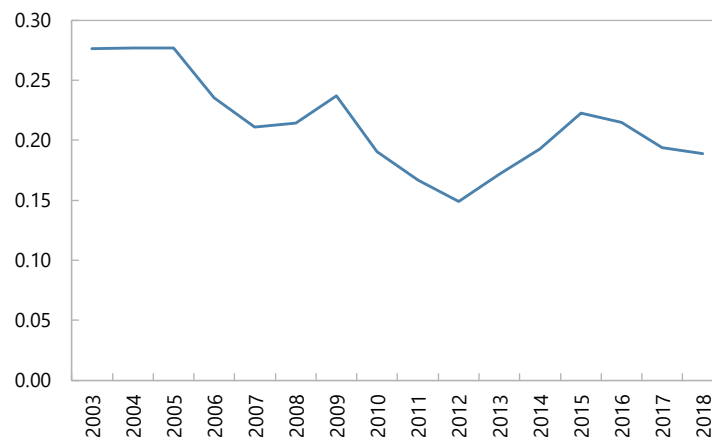
⁵ The average PIT rate will be determined by income, the personal allowance, and the level of consumption from formal establishments, hence, there is an incentive to consume from formal establishments up to the point where the tax burden is minimized.

allowing the VAT paid as a credit of the PIT or the expense as a deduction of its base, consumption is totally or partially exempted while only income is taxed (although statically PIT revenue will bear the brunt of the losses while VAT revenues would be increased). If a country in this situation wants to increase revenue, it has two alternatives: increases to the PIT rates or taxing consumption. Considering the level of PIT rates in some LICs and EMEs (like Ecuador) and how the credit (or deduction) complicates control (see next paragraph) and imposes the dead-weight loss of participation, the elimination of the credit would appear a priori as a better alternative.

Country / Income group / Region	Total Tax Revenue	PIT Revenue	VAT Revenue	PIT and VAT Revenue
Bolivia	23.8	0.2	7.8	8.0
Ecuador	14.3	1.0	6.5	7.5
Guatemala	10.4	0.4	4.8	5.2
Paraguay	10.3	0.1	5.1	5.2
Lower middle income	16.7	2.6	6.0	8.6
Upper middle income	18.5	2.6	5.9	8.5
High income	21.7	7.2	7.0	14.2
Africa	16.6	2.9	5.3	8.3
Asia Pacific	17.6	3.0	5.0	8.0
Europe	25.1	7.1	8.1	15.2
Middle East and Central Asia	13.1	2.5	6.7	9.2
Western Hemisphere	18.4	2.9	5.3	8.3

Source: IMF Staff based on FAD's Tax Revenue dataset.

13. **This tool has also created problems of control.** Tax administrations have detected the use of fake invoices to reflect personal consumption and reduce the PIT liability. It is very difficult for tax administrations to control this large number of invoices deducted from the PIT. Indeed, an integrated tax accounting system would be required to ensure VAT is accurately credited against the PIT. But even if tax administrations could exert an effective control (considering the current use of electronic means), doing so would entail very high costs as tax administrations would allocate resources on these activities that could be used in other kinds of controls (such as in the use of transfer prices for tax purposes, on the digital economy, or on large taxpayers). In Bolivia, for instance, PIT revenue was reduced from 0.27 percent of GDP in 2005 to 0.15 percent in 2012, mainly due to problems of control (Figure 1).

Figure 1. Bolivia, PIT (VCR) Revenue

Sources: IMF Staff based on data from Ministerio de Economía y Finanzas.

The Impact of the Deduction of Personal Expenses on Income Distribution in Ecuador

14. **In Ecuador, personal consumption up to a certain limit is deductible from the PIT's taxable income to encourage individuals to request formal invoices.** Focusing entirely on its effects on the PIT, this policy provides relief to individuals who are better-off since due to the high personal allowance, low-income individuals are exempted from the PIT liability. In fact, only individuals in the highest decile are liable for the PIT once the allowance and deductible personal consumption are accounted for.

15. **We conducted microsimulations by using data from the income and expenditures household survey and the income tax returns to analyze its impact on the income distribution.** Since household survey data was only available for the years 2012/13, we updated income, deductions, and personal allowance in line with inflation. Further, we used tax returns to correct for the misreporting and sampling bias at the top of the distribution that affects household surveys and calibrated our model to be consistent with the 2019 PIT revenue levels. We then estimated the Gini coefficient of the after-tax income distribution accounting for and without deductions to PIT's taxable base.

16. **Our main finding is that the elimination of the deduction of personal consumption would be revenue and equity enhancing.** Currently, deductions reduce the redistributive capacity of the Ecuadorian tax system, as measured by the Reynolds-Smolensky index,⁶ given that better-off taxpayers benefit from this provision the most as predicted by theory. Absent this

⁶ The Reynolds-Smolensky (RS) index measures the redistributive power of the tax. It is calculated by subtracting the Gini coefficient of pre-tax income from the after-tax income Gini. If the RS is greater than 0, the measure is equalizing, if the RS equals zero, the measure is neutral; and if the RS is less than zero, the measure entails higher levels of inequality.

measure and all else equal, PIT revenue would increase by 0.4 percentage points of GDP and the Gini coefficient would improve by 0.5 Gini points (Reynolds-Smolensky). Table 3 highlights the differences between current PIT system and those attained once personal deductions are eliminated.

17. **If the intended outcome of the policy is to protect low-income individuals, the policy objective would be better served by eliminating the deductions and implementing a well targeted transfer system** (see section III in this paper). For instance, the distribution of the proceeds from the elimination of the PIT deduction to individuals in the three lowest income deciles would contribute to achieve a more equal income distribution after taxes. Our estimations yield an improvement of 1.6 Gini points in a scenario where after the elimination of the deductions and, all else equal, the poorest individuals (first three deciles) receive an equal share of the additional revenue.

	Current PIT system	After policy change	Net Effect
PIT revenue (% of GDP)	0.9	1.3	0.4
			Reynolds-Smolensky
After-tax Income Gini			
Current PIT system	50.1		
After elimination of the deduction of personal consumption		49.6	0.5
After elimination of the deduction of personal consumption and redistribution		48.52	1.6

Source: IMF staff calculations based on the data from the Income and Expenditure Household Survey and the SRI.

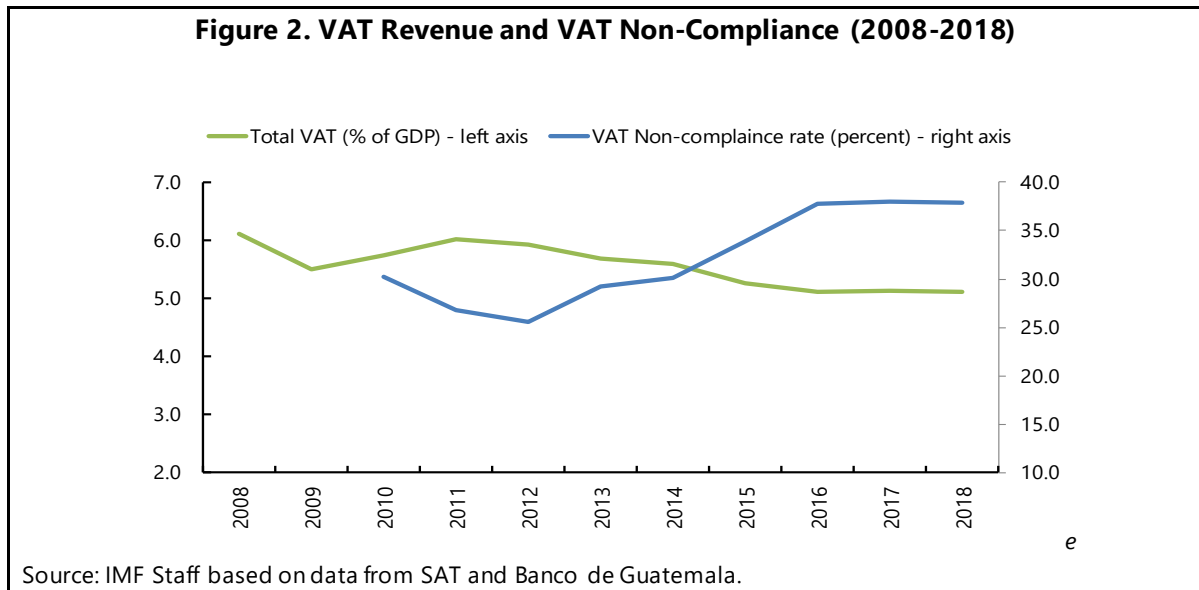
The Impact on VAT Revenue of the VAT Credit Against the PIT

18. **While the level of the PIT revenue is significantly affected (Table 2), there is no empirical evidence that this tool has improved the VAT revenue and that of other taxes.** In Ecuador, a study concludes that the deduction of personal consumption from the PIT base has contributed to the increase of formal invoices and of the declared gross income of medical providers in PIT filings (about an average of US\$ 5,000); however, there is no evidence that these providers have increased the amount of PIT paid, because they have used their own deductions to reduce their payable PIT (Bohne, A. 2018). This lends support to the negative effects on savings this tool could be causing by encouraging current consumption in lieu of savings.

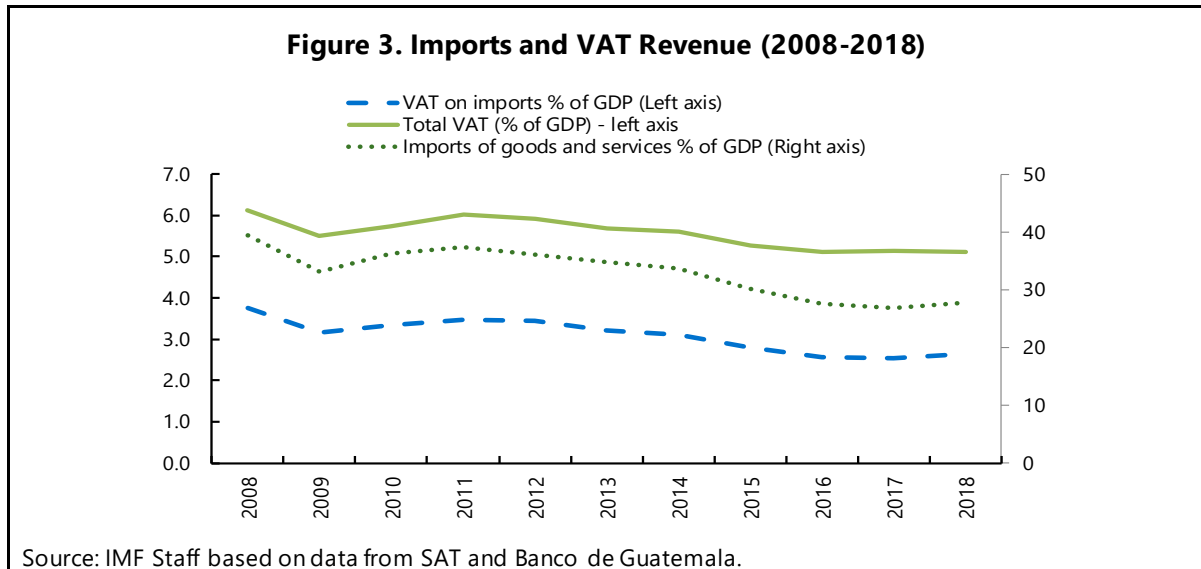
19. **In Guatemala, we did not find evidence that removing the VAT credit against the PIT negatively affected the VAT revenue.** VAT revenue (as percent of GDP) started to decrease in 2011 and continued to exhibit this trend until 2016 (Figure 2), while the VAT credit in Guatemala was substituted in 2012. These hint that moving from a VAT credit to a capped

deduction from the taxable income could have affected VAT revenue negatively. Given that other factors might come into play to explain the VAT revenue (e.g., the level and composition of consumption and of imports) we carried-out a more in-depth analytical analysis, which revealed that the change of VAT revenue as a share of GDP was not statistically different from zero once the policy change was enforced. This result was consistent after accounting for changes in household final consumption, imports and tax expenditures.

20. **We also found that changes in VAT collection were statistically explained by changes in the level of imports and final consumption (Appendix I, Table 1, column 1) but not by the reform.** A second model added VAT exemptions as a control variable, as these explain changes in VAT collection that are not captured by changes in final consumption or imports. By adding the tax expenditures, the overall fit of the model is improved, as measured by the r-squared coefficient, yet this variable is not statistically significant and only changes in imports remain as the significant variable in the both regression specifications. A graphical analysis also shows that the decline in VAT revenue concurs with a slump in imports (Figure 3).



21. **Although non-compliance VAT rates have been rising in Guatemala since the policy change took place (Figure 2), the econometric analysis did not reveal it was caused by this policy change.** A similar analysis to the one described in previous paragraphs indicates that the increase in the non-compliance rate after the reform was passed is not captured by the after-reform dummy variable (Appendix I, Table 2). In addition: (i) the non-compliance rates had been higher during the period the VAT was allowed as a PIT credit and (ii) the increase in non-compliance would be more likely related to several corruption scandals that had the Guatemalan government over the years following the reform and the increase of smuggling.



B. The Reduction of the VAT Rate for Using Electronic Means of Payments

22. **Some countries have allowed for a reduced rate applied on goods and services purchased using electronic forms of payments.** This tool aims at discouraging the use of cash, fostering financial transactions through banks and, hence, facilitating control for the tax administration. The backdrop of this tool is that individuals who are out of the banking system, who tend to be the poorest, will be left out, therefore, it is also regressive.

23. **To the best of our knowledge, only a few countries have introduced this tool.**

Argentina granted a VAT rate reduction of 5 percentage points for final consumer purchases paid with debit card until 2016 and 3 percentage points rate reduction for payments with credit card until 2003. Both benefits were eliminated because they entailed revenue losses and were regressive (they benefited a larger share of better-off households, Table 4). On the contrary, in Honduras (where the refund is equivalent to 8 percent of the VAT included in the invoice) and in Pakistan (where the VAT rate is reduced from 15 to 12 percent) the benefits for payments with debit or credit cards remains in place despite benefiting the rich more than the poor (Table 4).⁷

⁷ In Honduras and Pakistan, male individuals have greater access to debit and credit cards, potentially enabling them to benefit from the VAT rate reduction more than female individuals.

Table 4. Ownership of Financial Accounts and Digital Transactions by Income Group and Gender (2017)*As a share of individuals 15 years and older (percent)*

Type of Account	Any account in financial institution	Debit card	Credit card	Share of individuals who made or received digital payments	Share of individuals who made digital payments	
Argentina	Poorest (40%)	37.4	28.5	14.2	31.2	20.2
	Richest (60%)	54.9	49.9	30.4	46.1	39.7
	Male	45.4	38.9	26.4	37.7	31.4
	Female	50.2	43.6	21.7	42.5	32.3
Honduras	Poorest (40%)	31.4	7.8	2.2	24.9	17.3
	Richest (60%)	50.6	23.0	6.1	45.4	39.3
	Male	47.0	21.4	7.8	43.2	36.5
	Female	39.3	12.9	1.6	31.8	25.1
Pakistan	Poorest (40%)	12.8	4.4	0.8	11.1	8.0
	Richest (60%)	21.5	10.9	1.1	22.1	18.5
	Male	29.0	13.5	1.2	29.2	23.5
	Female	6.3	2.7	0.7	5.3	4.5

Source: IMF staff based on data from Global Findex Database.

24. **Korea launched in 2005 a program which provided incentives for both merchants and unregistered final consumers to reporting electronically sales in cash** (it was known as the 'cash receipt system'). It relied on technology like a seller credit card terminal; however, unlike credit card transactions, the cash receipt transactions required detailed information on prescribed receipts to be eligible for the tax benefit. When making a cash sale, the vender recorded the sale on its terminal, generating a cash receipt for the customer and automatically sending the sale information to the National Tax Service. While the vendor was entitled to credit 1 percent of their cash turnover against VAT liability for each receipt issued (until 2009, starting 2010 a fixed amount was granted for any cash receipt or electronic invoice to compensate for the

cost of the Internet or outsourcing E-invoice issuing), customers were entitled to a credit against their income tax liability if they provided the name of the merchant and their income tax file number. The cost of the program was high: the main constraint faced by the tax authority was the need to keep the benefit to vendors and final consumers lower than the forgone VAT revenue if the sale was not reported (Pok-Keun Yuh, 2014).

25. **The program was successful in reaching its objective of reducing the number of underreported cash sales and it was canceled in 2015.** It reached its objective, in part, because of the consumer preference of using electronic means of payment in Korea, which facilitated the use the 'cash receipt system': since 1997, credit cards have been the primary payment method for private consumption in Korea. In 2014, they accounted for over 64.1 per cent of consumption expenditure, with debit cards accounting for a further 12.4 per cent of consumption expenditure (Krever, 2014). The corporate taxpayers who use E-invoice or the 'cash receipt system' increased to 99.4 percent of total CIT taxpayers in 2014 and from the amount of sales issued with these systems to 99.9 percent of total sales.⁸

C. Lottery Programs

26. **The Lottery Program scheme encourages final consumers to request invoices from suppliers which can be later exchanged for entries into lotteries.** These incentives (participation in lotteries and, in some countries, reduction of the VAT rate) forces the seller to record the sale and charge VAT, neutralizing the seller's incentive to sell without a tax to undercut the competition. More interestingly, this kind of program changes the focus from punishment for being tax non-compliant to providing potential rewards to individuals for being tax compliant. In this type of setting, the incentives of individuals for requesting invoices are directly related to the size of the prize and perception of winning. From a government's perspective the costs are the prize, revenue loss from VAT rate reduction, and advertisement required to inform the population; the benefits are improvements in monitoring the economic transactions as recorded by invoices and potentially higher VAT and CIT revenues. From the consumers' side, the welfare loss due to the time they invest in participation is also important.

27. **Several countries have established lottery programs.** In Brazil and Mongolia, the lottery program also includes a VAT refund to consumers. This makes it difficult to isolate the results of the lottery element of the program from the 'VAT reduction' effect. The VAT refund component receives the same criticism made to the VAT rate reduction programs analyzed in the

⁸ A survey of tax practitioners and employees of business taxpayers also showed that the program had a significant effect on tax compliance: 69.4 percent of the respondents agreed or strongly agreed that tax evasion would have declined (Krever, 2014).

previous sections because it benefits mainly the better-off households.⁹ In both, Brazil and Mongolia, the cost of the program is high compared with the benefits that the government receives. In addition to the VAT refunds, which reach about 20 percent of the total VAT paid in Mongolia and 20 percent of the VAT paid by the final sale establishment in Brazil (about 1 percent of the total value of the purchase), the administrative costs comprise, among others, the implementation expenses (including advertisements), customer services, and the bank fees for deposits of the refunds.

28. **The usefulness of these two schemes has been short-lived in some countries.** Initial high prizes and great media diffusion (which explains the programs' initial high costs) contributed to increase the level of invoices issued to final consumers. In some countries (Brazil and Argentina) participation notably decreased afterwards when prizes and advertisements decreased, diminishing the usefulness of the schemes. Argentina introduced the program in the middle 90s but eliminated it after four years. When the amount of refunds was reduced in Brazil, the participation also decreased: the program started with 67 thousand participants in 2008, reached a peak of 277 thousand in April 2015 and then declined (especially since August 2015 when the refund to final consumers decreased to 20 percent from 30 percent of the VAT paid by the final sale establishment) to be nowadays around 100 thousand.

29. **Only a few papers attempted to formally evaluate the impact of the program in Brazil.** Their results are positive only for the first years of the program when prizes and participation were higher. Naritomi 2019, found that VAT revenue increased by 9.3 percent net of rewards in the four years under analysis (2008 to 2011) but without including the additional administrative (advertisings, salaries, etc.) and welfare costs on final consumers (time needed to enroll, get the tickets, etc.). Mattos *et al* (2013) concluded that the impact of the program was limited; they did not find a robust effect of the program (together lottery and VAT refund) neither on total tax collection nor sectors other than services, as well as evidence of a non-linear effect in time (in the highly industrialized state of Sao Paulo, the effect was lower because the taxpayers compliance related to invoices issuance was higher).

30. **In Slovakia, the lottery was introduced in 2013 and its impact has been found to be modest** (European Commission, 2014).¹⁰ Its fiscal impact was estimated in an additional extra revenue of about EUR 8 million annually when extrapolating from the experience in the last quarter of 2013 and focusing on restaurants and retailers, sectors which are suspected to be those more likely to engage in tax evasion (European Commission, 2014). The analysis did not

⁹ In Brazil, for instance, the program requires certain level of education and easy access to Internet: final consumers have to enroll online to receive the lottery ticket (one for every US\$50 a consumer spends) and rewards (directly deposited into the consumer's bank account) are used to pay other state taxes; or transferred to another person with an online account or to a charity institution. As of 2011, 50 percent of the rewards had not been collected. This amounts to about 27 million of consumers who asked for receipts had not enrolled online in the first four years of the program, which was the only way to claim the reward (Naritomi 2019).

¹⁰ In Europe, Malta was the pioneer with its tax lottery in 1997, Slovakia and Portugal introduced similar schemes in 2013 and Romania in 2015.

show a significant increase of revenue from firms that issued more receipts. There was, however, a higher rate of sales increases from the pre- to the post-lottery period in small retail firms compared to the sales increase in larger retailers. However, the attribution of this increase is not identifiable to the lottery alone, mainly due to the multiple channels with which improved tax compliance was promoted. In addition, the total cost of the program was high compare to the extra revenue (EUR 1.6 million, including marketing, in 2014).

31. **In China, the use of lotteries has shown to be an effective measure to increase revenue and decrease evasion.** An empirical examination employing six-year data from 37 districts in Beijing and Tianjin indicated that sales tax revenue was significantly higher (over 17.1 percent), and the real growth rates of sales tax and total tax revenues were significantly higher (over 21.5 percent and over 10.4 percent, respectively) in areas where the lottery took place relative to those that did not implement the lottery (Wan, 2010).

32. **In Portugal, the VAT non-compliance decreased from 16 to 12 percent between 2013 (when the lottery was introduced) and 2014** (European Commission, 2016). Although no causality has been established in the available literature, the decrease in tax evasion coincided with the implementation of a broad set of policies enacted by the Portuguese government to combat tax evasion, including the implementation of an electronic invoicing system and the lottery program called “Fatura da Sorte”. According to governmental sources,¹¹ in 2014 (one year after the lottery program was introduced) the number of sales invoices with the consumer taxpayer number sent to the tax authorities increased by 36.3 percent in comparison to the previous year, and one year later, the total number of sales invoices increased by 51.2 percent (Governo de Portugal, 2016).

33. **In Mongolia, the lottery program is accompanied by a VAT refund.** The system, introduced in 2016, is technology-intensive, which implies that rich individuals, with better access to Internet, could be taking better advantage of the system compared to low-income individuals; final consumers must register in the tax administration, download an app in their smartphone, and scan the bar codes of each invoice or electronic ticket received from retailers to participate in the lottery. The app also allowed consumers to claim a refund of 2 percent of the value of their purchase. The lottery and the VAT refund have probably contributed to the notably increase on VAT revenue in Mongolia, which happened after the introduction of the program (VAT revenues increased to 6.6 percent of GDP in 2019 from 4.8 percent in 2016). However, without information of other explanatory variables from which VAT revenue depends, it was not possible for us to make an in-depth appraisal of the impact of program: between 2016 (when the program was introduced) and 2018 the level of investment in the mining sector increased notably pushing-up

¹¹ Fatura do Sorte: <https://faturas.portaldasfinancas.gov.pt/FatSorte/home.action> Invoices and documents issued and communicated for deductible expenses in the new: <https://faturas.portaldasfinancas.gov.pt/homeBeneficio.action>

the GDP, which could also have contributed to increase of VAT revenue (real GDP grew 12 percent and nominal GDP 26 percent). In addition, the direct cost of the government (on prizes and administration) were also high and may offset the revenue gains from the VAT.

III. TOOLS TO REDUCE THE IMPACT OF THE VAT ON LOW-INCOME INDIVIDUALS

A. Tax Credit to Low Income Taxpayers

34. **Although the VAT is efficient in raising revenue, it is often criticized due to its perceived regressiveness.** This claim rests on the assessment relative to income.¹² Since poorer households tend to consume a larger share of their total income, the ratio of the VAT burden and total income tends to be higher for these individuals than for richer households where consumption can be significantly below total income. Several measures attempt to address the impact of the VAT on low-income individuals. Most countries include reduced VAT rates or exemptions on a set of goods consumed by poorer households. Similarly, most countries feature VAT thresholds which exempt sales from small retailers (Box 1). A much less discussed and implemented measure is the VAT credit; this tool uses different criteria to target exclusively to low income households or “deserving” populations. In contrast, reduced rates, the VAT thresholds, and the tool discussed in Section II where the VAT paid is fully or partially refundable to all PIT taxpayers are not specifically targeted and thus inefficient.

35. **In Canada, only low-income PIT taxpayers may claim a General Sales Tax/Harmonized Sales Tax (GST/HST) credit.**¹³ The GST/HST credit is paid four times a year to individuals and families with low incomes to help offset all or part of the GST/HST that they pay.¹⁴ When taxpayers fill online the tax return, the Canadian Revenue Agency (CRA) automatically estimates the amount of the credit.

36. **Several factors are used to estimate the amount of the tax credit:** the number of eligible children registered for the GST/HST credit,¹⁵ the adjusted family net income (considering expenses, such as rent, energy, and property taxes), the residence of the taxpayer, and the benefits received from the province of residence. For instance, for a couple with a total annual income of \$25,731 Canadian Dollars (CAD) with two children of 4 and 8 years residing in Ontario,

¹² The regressivity of the VAT is not so evident if analyzed in respect of consumption. See, for instance, Thomas 2020 or Bachas and others 2020.

¹³ In addition, taxpayers may benefit from tax credit for provincial consumption taxes. The Canadian Revenue Agency administers several provincial programs that are related to the GST/HST credit (e.g., the Ontario, Nova Scotia, and New Brunswick harmonized sales tax credits). It is not necessary to apply to a province to get payments for these programs, the provincial credit payments will be combined with the federal GST/HST credit payments (except for the Ontario sales tax credit).

¹⁴ Canada Revenue Agency https://www.canada.ca/en/revenue-agency/services/forms-publications/publications/rc4210/gst-hst-credit.html#family_net_income

¹⁵ To be eligible, individuals must be residents of Canada and one of the following applies: 19 years of age or older, have spouse or common-law partner, or have at least a child. To apply, the taxpayer and all members of the family need a social insurance number (SIN).

the GST credit reached in October 2019 about \$221.5 CAD by quarter (plus \$102.7 CAD for the Ontario Sales Tax). The tax credit decreased when income increases (for instance, for the same family, but with an income of \$ 70,800 CAD, the tax credit decreases to about \$59.0 CAD for the federal GST and \$31.9 for the Ontario Sales Tax). Thus, the amount of the credit is not based on the amount of the GST/HST paid because it decreases when the GST/HST paid increases (assuming that the GST/HST paid depends on consumption and consumption depends on income). This credit could also be seen as a tax credit to poor people (the link to VAT is purely notional).¹⁶

37. **Recent research concludes that the GST/HST credit contributes to achieve a progressive VAT in Canada.** Godbout, L., at al, 2011 conclude that (i) without the credit, the GST/HST are almost proportional to household income in Canada and with this credit, the effective tax rate rises with income; and (ii) the tax credit is a more effective tool for improving the progressivity of consumption taxes than the zero-rating of basic groceries. We definitively agree, while the tax credit in Canada is targeted to low-income taxpayers, zero-rates and exemptions mostly benefit high income individuals (see Appendix II).

38. **It is worth noting that:**

- **The GST/HST credit in Canada applies in a context of high labor formalization and effective control.** Most LICs and EMEs that apply the VAT credit against the PIT need to improve their social safety net and taxpayer-register database to control this kind of tool. Uruguay is a clear example that an EMEs can do this, and an example too that offers lessons for countries to follow (see next section).
- **The VAT has a larger impact on low-income individuals in developed countries than in LICs and EMEs,** where the first deciles of income distribution are less affected by the VAT because a higher proportion of their consumption comes from self-production and most of their purchases are made in informal markets (less frequent in developed countries) in addition small taxpayers are registered in special scheme exempted from the VAT (see Box 1). This is very important when determining the level of the VAT refund.

¹⁶ The Canadian PIT credit for GST is refundable, so requires near universal filing but does not require that any PIT be owing.

Box 1. The VAT Impact on Low-Income Individuals in LICs and EMEs

As highlighted in IMF 2019, in practice, the VAT may not be as regressive as often supposed. Not only because of exemptions or the use of reduced tax rates on food and other goods that make up the consumption basket of low-income individuals but also because in LICs and EMEs most of the purchases happen in informal markets or are bought from very small retailers who are exempted from the VAT. In addition, consumption of self-produced food is out of the scope of the VAT (in general, the proportion of self-produced food is higher among low-income individuals than among rich).

Several studies for LICs and EMEs conclude that the VAT is not regressive. A pioneer study from Jenkins *et al*, 2006 concludes that the VAT is progressive in Dominican Republic where commodities on which poor households spend most of their income, even if they are included in the legal tax base, are administratively impractical to tax. By employing a rich data set on household incomes and expenditures (covering 2042 goods and services purchased by households of different income and consumption level and containing information on the type of establishment from which the items were purchased), Jenkins showed that the burden of the VAT is progressive over all the quintiles of household expenditure. Furthermore, if the base of the VAT is made comprehensive, the estimated incidence of the burden of the VAT is still progressive over all the quintiles household expenditure.

Similar conclusions were reached by Mariscal and Verner, 2017 (for Mexico) **and Fabrizio *et al* (2017)** for Uganda. Other studies found that the VAT is neutral¹ or that the VAT is a preferred option than others due to its efficient advantages, especially if it complements with expenditure measures. The later implies that, even more important, and highlighted in IMF 2019 (see Table 22 on page 43), the contribution of the VAT to inequality reduction needs to be analyzed in the overall fiscal policy context (including both the tax and spending system).

¹ For instance, Fabrizio *et al* (2017) found that an increase of the VAT rate from 15 to 18 percent in Honduras would have a neutral impact on income distribution due to the large informal sector in this country. Same conclusions for Namibia (World Bank, 2017); Ethiopia (Hills and others, 2017) and Togo (IMF, 2017).

B. Smart Cards to Refund the VAT to Low Income Individuals

39. **The Social Card Program in Uruguay (Programa Tarjeta Uruguay Social) is a transfer program targeted to low-income households.** It has been operating since May 2006 and the main difference between the VAT credit provided in the previous section is that it is a monetary transfer granted to 60 thousand households in the worst socioeconomic situation in the whole country through a magnetic card instead of through the PIT (Uruguay's population is about 3.5 million inhabitants). The transfer made through the magnetic card can be used in purchases from the Network of Solidarity Shops (Red de Comercios Solidarios), about one thousand shops. A monthly amount is added on each card that varies according to the composition of the household (e.g., considering the number of individuals, their ages, 18-year-old or less).

40. **The 30 thousand households that are in the worst socioeconomic conditions receive a double amount.** In 2019, a household with two children received Uruguayan Peso (URU)\$ 1,610 (about US\$ 40.0) or URU\$ 3,220 (about USD 80) per month. The beneficiaries are selected objectively; the Ministry of Social Development visits all houses under extreme socioeconomic

conditions throughout the country, collecting information. Based on this information, a value of the Critical Deficiency Index (ICC) is assigned to each household (the ICC is an instrument prepared by the public university of economics that measures the degree of vulnerability of a household). With the Uruguay Social Card individuals can buy any product except tobacco, cigarettes, and alcoholic beverages.

Thailand introduced in 2018 a system under the government's welfare scheme to reimburse the VAT to low-income individuals through a smartcard. From November 2018 to April 2019, State Welfare Smartcard holders— low-income earners qualified by the Ministry of Finance — swiped their cards at shops with electronic data capture terminals, with 5 percentage points of the 7 percent VAT rate reimbursed to the consumer up to USD 16 per month (1 percentage point going towards contribution to the National Savings Fund or the holder's savings account and the rest to the Revenue Department).¹⁷ After its launch there were 14.5 million smartcard holders¹⁸ and the Government had transferred around 1,168 thousand USD to the e-wallets on the State Welfare Card and an additional amount of around 223 thousand USD to the cardholder's savings accounts.¹⁹

C. The VAT Paid Creditable to all Taxpayers with Limits

41. **In Portugal, only a portion of VAT paid for selective services can be claimed as a tax credit on the PIT.** A credit equal to 15 percent of the VAT incurred in selected services with a maximum of EUR 250 per member of the family (taxpayer and dependents) is available (article 78-F of the CIRS). The VAT must proceed from an electronic invoice that reflects only the following services: maintenance and repair of motor vehicles and motorcycles; accommodation, catering and the like; hairdressing salons and beauty institutes; and veterinary activities, all activities which are prone to cash transactions. The total VAT paid on public transportation can be also deducted, but always within the limit of EUR 250. This incentive can be allocated to a non-profit organization.

42. **Because its maximum of EUR 250, the VAT credit against the PIT in Portugal notably benefits more the low-income individuals.** This tool also encourages compliance, but it is especially salient for its distributive effects. The amount of the credit as percent of income (the effective tax rate, Effective Tax Rate (ETR)) is reduced to the same extent that the income of taxpayers increases; for instance, the ETR for an individual with income of EUR 7,091 decreases from 14.5 to 11.0 percent while for an individual with an income of EUR 200,000 the reduction is only of 0.1 percentage points (Table 5). In addition, the design of the tool in Portugal presents

¹⁷ From November 2019 to September 2020 (11-month period), the cardholders were only reimbursed 5 percent of the amount of VAT. During this period, the government transferred around USD 2,665 thousand to the e-Wallet on the State Welfare Card.

¹⁸ Thailand's population is about 68 million inhabitants.

¹⁹ Macroeconomic Developments and Prospects in Low-Income Developing Countries: 2019—Chapters 2: the VAT Experience in LICD.

another significant advantage: it is focused in selected activities that present high risk of non-compliance, implying that the objective is twofold: reducing the regressiveness of the VAT and simulating final consumers to request invoices.

Table 6. Portugal: Effect of the VAT Credit against the PIT

Taxable income	Marg Rate	Before Credit		After Credit	
		Tax liability	ETR	Tax liability	ETR
Up to 7,091	14.5	1,028	45.5	778	11.0
7,091 - 10,700	23.0	1,858	17.4	1,608	15.0
10,700 - 20,261	28.5	4,583	22.6	4,333	21.4
20,261 - 25,000	35.0	6,242	25.0	5,992	24.0
25,000 - 36,856	37.0	10,629	28.8	10,379	28.2
36,856 - 80,640	45.0	30,331	37.6	30,381	37.3
80,640	48.0	87,624	43.8	87,374	43.7

Source: IMF Staff from the PIT Law of Portugal.

IV. CONCLUSIONS AND POLICY RECOMMENDATIONS

43. **This paper analyzed the use of two different tools: one to encourage final consumers to request formal invoices (Section II) and another to reduce the potential regressiveness of the VAT (Section III).** The analysis contributes to the existing literature by providing a clear characterization between these groups of tools that are too often misunderstood. Although sometimes policymakers confuse these two groups of tools, they are very different regarding:

- *Objectives.* While the first group of tools aims at strengthening the issuance of invoices to final consumer to control the VAT and other taxes (e.g., the CIT), the second group aims at reducing the impact of the VAT on low-income individuals.
- *Impact on income distribution.* While the first group of tools are regressive, the second one is progressive because they are targeted only to low-income individuals.
- *Administrative effect.* While the first group of measures imposes a huge compliance burden and sometimes complicate the administration (including the use of fake invoices), the second one affects a reduced number of people which simplify administrative control.

44. **This paper demonstrates that using the VAT as a credit or a deduction of the PIT base:**

- **Reduces the redistributive capacity of the Ecuadorian tax system** (as measured by the Reynolds-Smolensky index, given that better-off taxpayers benefit from this provision the most). Absent this measure and keeping everything else constant, PIT revenue would increase by 0.4 percentage points of GDP and the Gini coefficient would improve by 0.5 Gini

points, even without considering improvements from the expenditure side for allocating targeting benefits in low-income individuals.

- **Did not impact VAT revenue in Guatemala.** We did not find evidence that allowing crediting the VAT paid on personal consumption from the PIT has contributed to improve VAT and other taxes revenue: (i) our study demonstrates that the elimination of this credit in Guatemala did not have a negative impact on the VAT revenue; and (ii) a study for Ecuador (Bohne A. 2018) concludes that there is no evidence that providers, who increased the level of formal invoices, have increased the amount of tax paid.

45. **Tools to address the impact of the VAT on low-income individuals analyzed in this paper have been successful in improving income distribution.** This is mainly because they are well targeted on low-income individuals. Research from Godbout et al., 2011 concludes that the GST/HST credit to low-income individuals has contributed to turn the VAT in Canada from proportional to progressive and it is clear from our analysis that the tax credit in Portugal and the use of smart cards to refund the amount of the VAT paid to low-income individuals in Uruguay have had progressive enhancing effects.

46. **Therefore, it is advisable to avoid the use of the VAT credit or personal expenses as deduction of the PIT** (except when it is targeted toward low-income individuals an or amount with maximum, such as in Portugal) **and any reduction in the VAT rate for using credit and debit cards.** They are regressive, expensive, and there is no evidence that they have contributed significantly to improve VAT revenue. When the administrative capacity allows and it is necessary to reduce the impact of the VAT on low-income individuals (because they make their purchases in formal markets and/or the goods and services they consume are no exempted from the VAT), it is better to implement a low-income individual targeted program (both the Uruguayan and Canadian approaches provide a good roadmap to lessen the VAT's distributional impacts).

47. **This paper also finds that:**

- **Reductions in the VAT rate to encourage the use of credit and debit cards are regressive, expensive, and there is no evidence that they have contributed significantly to improve VAT revenue.**
- **The effectiveness of lottery programs to encourage formalization involves high costs** (which sometimes are similar or higher than the level of revenue they generate, even without considering welfare costs and the negative distributional impact). Therefore, it is advisable to maintain them if their benefits (increase invoicing, recording to final consumers, and, especially, reduction of non-compliance) are significantly higher than their costs (e.g., prizes, adversities, bank fees, administrative opportunity costs, negative distributional impacts, and welfare losses) and eliminate them when they have reached their objectives (as Korea did with the cash receipt system).

Appendix I. Measuring the Impact of the 2012 PIT Reform on VAT Revenue in Guatemala an Empirical Approach

In April 2012, Guatemala enforced the Decree 10-2012 whereby consumption expenditure supported by VAT invoices would no longer be creditable against the PIT liability for salaried workers. Instead, VAT invoices, up to Q.12,000 (USD 1,530), would be allowed as a deduction from the PIT's taxable income. This change was accompanied by an increase in the PIT's standard deduction to Q.48,000 (USD 6,120), a rise of Q.12,000 relative to the standard deduction (Q. 36,000 or USD 4,590) prior to the reform. These two measures combined increased the total deduction available to salaried workers to Q.60,000 (USD 7,650) per year.

Two opposing trends can be observed following the reform. The VAT non-compliance rates increased while VAT revenue declined following the 10-2012 decree (see Figure 2 in the main section of this paper: VAT Revenue and VAT Non-Compliance (2010-2018)). However, we did not find statistical evidence of the policy change having a direct effect on VAT revenue collection or non-compliance rate. Overall, the trend of VAT revenue and in the non-compliance, rate is better explained by a decline in imports and by other contemporaneous political scandals.

To explore the effects the reform might have had on VAT revenue collection and VAT non-compliance rates, we use a static contemporaneous linear regression model on annual, quarterly and monthly data. We used data on VAT revenue, VAT non-compliance rate, tax expenditures of VAT, final consumption of households, imports and an index of monthly economic activity from the Guatemalan Tax Administration and the Central Bank of Guatemala for the period 2009 – 2019. Due to limited availability of data at the annual level, we complement the analysis by employing disaggregate data at the quarterly and monthly data to analyze the effects of the reform on VAT revenue.

The main specification uses the differences in VAT revenue collection regressed on the changes in a set of explanatory variables (final household consumption, imports, a monthly index of economic activity) a dummy variable to capture the effect of the reform and a time trend variable for monthly and quarterly data (Equation 1).

$$(1) \Delta VATrev_t = \beta_0 + \beta_1 \Delta X_t + \beta_2 d_t + \beta_3 tt_t + u$$

The variable of interest is the change of total VAT revenue, represented by $\Delta VATrev$, measures the year-on-year percent change in VAT revenue as a share of GDP, X is a set of covariates which depends on the periodicity of the data, d_t is a dummy variable indicating the enforcement of the reform, tt is a seasonal trend that controls for cyclical variations at the quarterly and monthly periodicity levels and u is the error term. In general, we expect increases in final consumption of household and imports to be associated with a more VAT revenue collection, while we expect tax expenditures to have the opposite effect.

We analyze total VAT revenue collection and VAT at the imports stage to study the effects on VAT revenue. A graphical analysis shows that the decline in VAT revenue coincides with a

slump in imports (Figure 3: Imports and VAT Revenue in the main section of the report). Since VAT on imports represents more than 50 percent of total VAT revenue, the overall decline in VAT revenue is mostly attributable to the decline in total imports as a share of GDP.

The latter finding is empirically supported. By regressing the percentage change in VAT collection (ΔVAT_t) on the change on final consumption (ΔFC_t), change on imports (ΔM_t), and a dummy variable indicating the year of introduction of the reform; we find that changes in VAT collection are statistically explained by changes the shares of imports and changes in final consumption (Table 1, column 1) but not by the reform. A second model adds tax exemptions given to VAT taxpayers (Tax expenditures- TE_t) as a control variable, as it might explain changes in VAT collection that are not captured by changes in final consumption or imports. By adding the tax expenditures, the overall fit of the model is improved, as measured by the r-squared coefficient (Table 1 column 2), yet this variable is not statistically significant and only changes in imports remain as the significant variable in the both models, as was pointed out in the graphical analysis.

Similarly, there is no statistical evidence of changes in VAT revenue collection being explained by the reform. Using quarterly and monthly data, the coefficients of the dummy variable remain statistically insignificant (Table 1, columns 3 and 4), whereas changes in final consumption and imports do not appear to be statistically significant at the quarterly level. The expected relationship is borne out in the monthly data, where economic activity is statistically significant. Since tax expenditures are not available at the quarterly or monthly levels, we did not include it as an explanatory variable.

Dependent variable	(1) Percent change in VAT revenue (Annual)	(2) Percent change in VAT revenue (Annual)	(3) Percent change in VAT revenue (Quarterly)	(4) Percent change in VAT revenue (Monthly)
Explanatory variables				
Percent change in final consumption	0.993* (0.546)	0.201 (0.968)	-0.3902 (1.021)	
Percent change in imports	0.707*** (0.12)	0.576** (0.161)	0.256 (0.387)	
Dummy (0 before reform)	-0.00261 (0.0148)	-0.000922 (0.0213)	-0.161 (2.866)	2.949 (7.181)
VAT tax expenditures (as % of GDP)		-0.0176 (0.0967)		
Percent change in the Monthly Index of Economic Activity (IMAE)				2.444*** (0.498)
Constant	0.0127 (0.00984)	0.029 (0.141)	9.709 (8.908)	-0.958 (4.913)
Time dummies	NO	NO	YES	YES
Observations	14	10	41	184
R-squared	0.787	0.844	0.764	0.539
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

We conduct a similar statistical analysis using the VAT's non-compliance rate as the dependent variable instead of VAT revenue collection. Table 2 presents the results of a model where changes in VAT non-compliance rate are explained by changes in final consumption, imports, and VAT tax expenditures and a dummy variable representing the enforcement of the reform. The coefficients from the regression are statistically insignificant. Thus, indicating that the increase in the non-compliance rate after the reform was passed is not captured by the dummy variable. Given the small amount of observations, and the limited amount of degrees of freedom available to estimate the coefficients, a natural concern is the lack of precision of the coefficients presented in column (1).

Independent variable	(1) Percent change in VAT - Non-compliance rate
Explanatory variables	
Percent change in final consumption (as a % of GDP)	0.79 (4.569)
Percent change in imports (as a % of GDP)	0.354 (2.410)
Dummy (0 before reform)	0.0649 (0.0842)
Percent change in VAT tax expenditures (as % of GDP)	-1.059 (1.649)
Constant	0.0154 (0.181)
Observations	7
R-squared	0.981
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Appendix II. The Impact on Income Distribution of Exemptions and Reduced Rates of Consumption Taxes

VAT has often been deemed as a regressive tax because propensity to save increases with income. Since low-income households tend to spend a greater share of their income on consumption compared with high-income households, the burden is apparently regressive when measured as a share of current income. The tax burden as a share of income is higher at lower levels of the income distribution and decreases as income rises. As VAT has become more prominent within countries' tax systems, concerns have often been expressed regarding its distributional impacts.

Reduced rates and exemptions are widely used to mitigate the regressivity of the VAT but are poorly targeted as distributional devices. Often these do reduce regressivity, but, as shown in Table III.1, they are a very poorly targeted way of helping vulnerable groups. Even amongst OECD countries (see OECD 2014), the largest share of the benefits granted through differentiated VAT rates accrue to the highest income quintile. The same pattern is repeated in a sample of Latin America and African countries and South Korea, where the fifth quintile benefits the most from exempted goods and reduced rates (see also IMF 2019 and Phillips and others 2019 for similar results in other countries). The point is simply that the poor may spend a larger proportion of their budgets on basic items such as food for example, but the better-off spend more in absolute terms, and so receive a larger share of the total benefits.

Table II.1. Distribution of VAT Exemptions and Differentiated Rates

Country	Quintile					Total
	1	2	3	4	5	
Differentiated Rates						
20 OECD countries	13.5	17.3	20.0	22.5	26.7	100.0
Exemptions and Differentiated Rates						
Honduras	7.3	12.4	17.1	22.5	40.7	100.0
Nicaragua	4.0	7.0	10.2	23.7	55.1	100.0
Colombia	5.6	9.2	13.3	21.0	50.9	100.0
Dominican Rep.	10.3	14.1	16.8	21.8	37.0	100.0
Mexico	10.8	17.2	21	23.1	27.9	100.0
South Korea	6.3	13.8	20.2	25.7	33.9	100.0
Morocco	14.5	12.0	15.0	19.7	38.8	100.0
Tunisia	7.9	12.7	17.0	23.2	39.2	100.0

Source: OECD (2014); Honduras: IMF based on the household survey of 1998. Nicaragua, IMF based on household survey of 2006-2007. Colombia, IMF, based on data from DIAN 2006. Dominican Republic, E. Morales. OECD-LAC Tax Policy Forum Presentation, September 2010. South Korea: Park and Jung (2014); Morocco, Fouzi Mourji (2011); Tunisia, Mansour (2015); and, Mexico SHCP (2016) (includes only the zero rate on basic foods).

Despite the purported regressivity, studies have also found the VAT to be distributionally neutral. For instance, VAT incidence analysis in Namibia (World Bank, 2017), Ethiopia (Hill and others, 2017) and Togo (IMF 2017). Further it is important to acknowledge that there are effects at work that are not always captured in analyses of VAT incidence (IMF 2019):

- The VAT registration threshold implies that sales by small retailers—where the poorest often buy—are VAT exempt. Where data is available the moderating impact of this has been found to be substantial.
- Food production for self or home consumption is also exempt, with similar effect. More generally, studies which assume the incidence of noncompliance to be equal across all consumption/income deciles overstate the regressivity of the VAT. For instance, Bachas (2019) finds that top decile has 27 percent less untaxed consumption than the bottom one.
- If measured based on aggregate consumption, the VAT becomes a close to neutral or—due to untaxed consumption—even a slightly progressive tax. Alavoutunki, Haapanen, and Pirttila (2019), for instance, find that the adoption of VAT has not led to increased inequality when measured based on consumption, whereas measuring based on disposable income suggests that VAT introduction raises inequality.

More importantly, the VAT's contributions to poverty and inequality reduction need to be appraised in the context of the overall tax and spending system. The VAT is an efficient revenue raising tax, but—being based on anonymous transactions rather than finer indicators of ability to pay—is hard to tailor to serve equity concerns. Even in advanced economies, where the personal income tax and other instruments can be more effectively structured to ensure a degree of progressivity on the tax side, equity objectives are mainly served through a range of spending instruments. Recent studies by Commitment to Equity (CEQ) Institute, IMF and World Bank on fiscal incidence and income distribution (Table III. 2) stress that the VAT is an important tool to finance the desired social spending programs geared toward poor households and the provision of other, broad-based, critical public goods. (IMF, 2017). These applications broadly indicate that VAT is a preferred reform option regarding the economic and distributional impact, if complemented by mitigating spending measures (IMF 2019).

Table II.2 Findings from Recent Incidence Studies

Country	Year	Authors	Value Added Tax	Social Assistance
Cameroon	2018	CEQ, IMF	Small adverse impact on income distribution; Removal of VAT exemptions needed to boost inequality reducing transfers	Redistributive impact of cash and indirect transfers is weak; in-kind transfers having larger impact on poverty and inequality reduction.
Ghana ^{1/}	2018	CEQ	VAT reduced rates and exemptions costly and mildly progressive (yet, not well targeted towards the poor)	Cash transfers are fairly well targeted and have positive redistributive effect
Eswatini	2017	CEQ, WB, IMF	...	Social transfers generally progressive. Step-up in cash transfers and means-testing needed to further reduce inequality
Ethiopia ^{1/}	2017	CEQ	VAT reduced rates and exemptions costly and regressive (not equalizing)	Cash transfers are poorly targeted and have limited redistributive effect
Namibia	2016	CEQ, WB, IMF	...	Large social assistance program(s) but poorly targeted
Nigeria	2018	CEQ, IMF	Increasing VAT revenue progressive (reduce income inequality) but increase poverty	Social programs of limited coverage. Widening and scaling up social safety nets would significantly reduce poverty and reduce inequality
Senegal ^{1/}	2018	CEQ	VAT reduced rates and exemptions costly and neutral (not equalizing)	Cash transfers are fairly well targeted and have positive redistributive effect
South Africa	2017	CEQ, WB	VAT mildly regressive.	Social spending progressive and significantly reducing inequality; targeting of social grants improved in recent years; quality of in-kind transfers needs improving.
Togo	2017	CEQ, IMF	VAT is progressive but increases poverty rate of poor and near-poor	Social spending low and poorly targeted; More VAT revenue needed to finance desired social programs.
Uganda	2017	CEQ	VAT marginally reducing inequality	Social spending, except for spending on tertiary education, reduces inequality but is very small.
Zambia ^{1/}	2017	CEQ, WB, IMF	VAT reduced rates and exemptions costly and regressive (not equalizing)	Cash transfers are fairly well targeted and have very positive redistributive effect

Note: CEQ's microsimulation methodology adopted in most of the studies, with certain modifications to account for data availability. Consumption-based deciles (derived from household budget surveys) and Gini calculations used in most cases; informality is usually assumed to be homogeneous across households' distribution; embedded VAT calculated using input-output tables where available.

^{1/} Focus on the analysis of the incidence of VAT reduced rates and exemptions, rather than the existing VAT

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