Final report UGA-20087 March 2023

# Drivers and implications of import tax evasion in Uganda

**Michael Best**
**Nada Eissa**
**Sandra Sequeira**
**Joseph Okello Ayo**
**Parijat Lal**
**Jakob Rauschendorfer**

IGC

DIRECTED BY
LSE UNIVERSITY OF OXFORD

FUNDED BY
UKaid from the British people

# Drivers and Implications of Import Tax Evasion in Uganda

## Executive summary

**Improving domestic revenue collection is a pressing objective for the Government of Uganda.**

**Combatting the evasion of taxes on imports is an important tool for boosting revenue collection in Uganda.**

**We combine publicly available and anonymized administrative data to identify evasive behavior by importers and estimate the associated fiscal cost.**

**Our analysis suggests that misreporting in customs and VAT declarations by importers is systematically linked to tariff and exchange rates.**

**Additional access to existing data would dramatically enhance our ability to pinpoint the drivers of evasion and provide precise policy-relevant analysis.**

# I. Introduction

Improving domestic revenue collection has become one of the most pressing policy objectives for the Government of Uganda. Tax revenues are urgently needed to finance recurring expenditures in the areas of education, health, and other public infrastructure that will be crucial as the economy recovers from the pandemic. While pressure to increase revenues was already high prior to the crisis, the Covid-induced recession led to significant revenue shortfalls: In both the 2019/20 and 2020/21 fiscal years, net revenue collection amounted to less than 90% of the annual revenue target.

An intuitive response to this challenge could be to increase taxes. However, this option may be neither feasible nor desirable. Instead, developing a deeper understanding of evasion and improving the collection of taxes already in place may yield higher revenues without wholesale changes to Uganda's tax system. One promising avenue is combating the evasion of import taxes, a central source of tax revenues for Uganda and other countries at similar stages of development.

Import taxes – most notably tariffs and the Value Added Tax (VAT) on imports – continue to constitute a significant share of Uganda's total tax collection. In 2020/21, the URA collected a total of 19,263 billion Ugandan Shilling (UGX) in net revenues. Import taxes represented almost 40 percent of this figure, with revenues from import duties (i.e., tariffs) and the VAT on imports alone contributing about 22 percent to Uganda's total national tax collection.

While taxing imports continues to be a key source of revenue for Uganda, there is ample anecdotal evidence for import tax evasion in the country.[1] Studies conducted in similar economies empirically show that tax evasion in customs is pervasive and responsible for considerable revenue losses. The methods introduced in previous literature suggest that Uganda could combat tax evasion in customs by leveraging available data and common analytical methods.

In a seminal article, Fisman and Wei (2004) study the evasion of import taxes for trade flows between China and Hong Kong. The authors introduce the concept of the "evasion gap": the difference between a country's reported exports to a trading partner and the trading partner's reported imports from the exporting country at the product level. They find that in the context of China and Hong Kong, a one-percentage-point increase in the tax rate levied by China on imports from Hong Kong is associated with a 3 percent increase in the evasion gap. Their approach of using "mirrored trade statistics" i.e., comparing publicly available records of export

[1] In 2019, *The East African* reported on the widespread evasion of import taxes with a piece titled "*Trade fraud sucks the lifeblood from Uganda's already struggling economy*" (The East African 2019).

and import flows, has been replicated for a number of different countries. In general, these studies demonstrate the applicability of this empirical approach in detecting evasion in customs and fostering revenue collection through better enforcement.[2]

In this project, we aim to study trends in reporting that point to evasion, i.e., trends that are suggestive of importers trying to minimize their import tax burden. To do this, we: (i) apply the analysis of Fisman and Wei (2004) to Uganda's trade with other countries, and (ii) extend the "evasion gap" methodology to study a previously unexplored source of discrepancies in the reporting of import taxes - VAT declarations. Our hope is to provide the URA with a simple yet powerful empirical framework to combat import tax evasion. We further hope to highlight the value of combining publicly available international trade data with URA's own records and construct informative links across URA datasets to identify evasion at a disaggregated level.

The remainder of this paper is organized as follows. In the next section, we briefly describe the data used in this project and introduce the key measures of evasion. In section three, we provide conservative estimates for the extent of fiscal losses from import tax evasion using two major mechanisms through which traders can evade import taxes. Combined, our estimates suggest that the evasion of import taxes amounts to between 3.1 and 15.3 percent of Uganda's net tax revenues per year. In section four, we take our approach one step further and explore the relationship between tax rates and extent of evasion, as well as other observable factors that can be used by the URA to predict and combat evasion. We close with steps for future research in section five.

[2] Chalendard, Raballand and Rakotoarisoa (2016) study import tax evasion in Madagascar and find that the evasion of taxes in customs reduced non-oil customs revenue by at least 30 percent. Andreoni and Tascotti (2019) employ the concept of the evasion gap in the case of Tanzania and show that revenue losses due to smuggling may be as high as 500 million USD annually.

# II. Data sources, evasion gaps, and limitations

## II.1 Customs declarations

One of the key measures of import tax evasion used in this paper is built from publicly available trade statistics hosted by *UNComtrade*, an online repository of international trade data. Over 170 countries provide the United Nations with detailed information on import and export flows for different product types and trading partners. Trade values and quantities for imports and exports are standardized before being published online. We obtain monthly and annual export flows at the 6-digit level of the international *Harmonized System* to Uganda, as reported by Uganda's trading partners, from 2010 to 2020.[3]

We augment this publicly available information with transaction-level customs data detailing the import duty and VAT collected on individual import consignments into Uganda, as well as a whole host of other consignment characteristics. These data are collected from declarations in the URA's *Automated System for Customs Data* (ASYCUDA) and have been made available for this research. We also merge our data with statutory tariff rates applied by Uganda on imports from outside the EAC, which are set for each fiscal year.[4]

We then follow the previous literature using mirrored trade statistics to compute the "trade gap." Formally, this indicator is defined as:

$$TradeGap_{cpt} = Exports_{cpt} - Imports_{cpt}$$

The trade gap captures discrepancies between trading partner *c's* reported exports of product *p* to Uganda in time period (month or year) *t* and Uganda's reported imports from partner *c* of product *p* in the same time period *t*. A positive gap may be suggestive of evasion, as the lower the reported value of imports, the lower the tariff and VAT liability for traders.

We also employ information available in the ASYCUDA data to construct a schedule of statutory VAT rates at the product/year level. Specifically, we consider imports for each product type and year combination, assigning the official rate of 18% to those pairings where at least 25 percent of consignments are reported to have paid VAT, and 0% otherwise. This is a highly conservative

[3] 2020 is the latest year for which these statistics are currently available.

[4] Additionally, Uganda's trade policy environment is extremely vibrant with new opportunities and incentives for traders to evade import taxes arising constantly. For example, in the more recent past Uganda has frequently deviated from the Common External Tariff of the East African Community for products of strategic interests through unilateral deviations. Such frequent changes to the country's tariff schedule create incentives for evasion through underreporting (due to higher statutory rates) and misclassification of imported products (due to different rates applicable on very similar products). Additional agreements like the AfCFTA as well as agreements between the UK and the EAC are currently shaping up, suggesting a rapidly evolving tariff schedule in the future with ample opportunities to evade.

approach, as even a single shipment in a given year/product combination that has been subject to VAT payments may be indicative of the statutory VAT being applicable. Finally, throughout this paper, we exclude imports from members of the EAC customs union (Kenya, South Sudan, Tanzania, Rwanda and Burundi), since intra-EAC trade is conducted tariff free (since VAT is applicable on intra-EAC trade, this approach will also understate the potential VAT loss).

### Trade gap sample overview

After cleaning and merging these different datasets, we obtain a panel covering 352,441 trade gaps at the product, country of origin, year level, complete with information on applicable statutory tariffs, statutory VAT rates, and actually collected import taxes. In sum, we cover 5,330 types of products imported into Uganda from 205 trading partners over 2010-2020. We find a large number (202,369, 53.9%) of orphan imports[5] that do not have corresponding export value records, while we find a smaller number (3,888, 1.1%) of orphan exports that lack a record in ASYCUDA. Taking the summary among 145,649 non-orphan matches, we calculate the measured customs gap to have a mean of –84,063, with a standard deviation of 3,450,173. The customs gap ranges from UGX –559 million to UGX 145 million.

**Table 1. Summary statistics for trade gap sample**

| | Mean | Standard Dev. | Minimum | Maximum | Count |
|---|---|---|---|---|---|
| Export Value | 0.21 | 1.76 | 0.00 | 155 | 145,649 |
| Import value | 0.30 | 3.87 | 0.00 | 561 | 145,649 |
| Raw Value gaps | -0.08 | 3.45 | -559 | 145 | 145,649 |
| Log (1+ Raw Value Gap) | 0.08 | 2.24 | -14.38 | 13.69 | 145,649 |
| Statutory Rate | 0.32 | 0.15 | 0.00 | 1.36 | 145,649 |
| Log (1 + Stat.Rate) | 0.27 | 0.12 | 0.00 | 0.86 | 145,649 |

Within the dataset, we calculate the annual average import values across **countries** and identify that Uganda imports mainly from India (UGX 3.38 Trillion), China (UGX 2.95 Trillion), United Arab Emirates (1.60 Trillion), and South Africa (UGX 681 Billion). Other major trading partners include Japan, the United States, the United Kingdom, and Germany. **Product-wise**, Uganda mainly imports Petroleum Oils (UGX 2.36 Trillion), Unwrought Gold (UGX 2.33 Trillion), Medicaments (UGX 849 Million), Crude Palm Oil (UGX 467 Million), and Hard Wheat (UGX 293 Million).

[5] These orphan imports may be indicative of evasion via a specific channel of misclassification, where importers mask the true product categories of their imports in order to avoid high tariffs. Our current analysis does not delve into this possibility.

Considering instead the annual average values of trade gaps, the top **countries** of origin are Hong Kong (UGX 19.3 Million), Italy (UGX 8.1 Million), France (UGX 6.8 Million), and Belgium (UGX 5.5 Million). **Product-wise**, items such as Telephone Sets (UGX 27.0 Million), Footwear with Outer Soles (UGX 25.2 Million), Medicaments (UGX 18.8 Million), Telephone Sets/Aerial Reflectors (UGX 11.8 Million), and Wigs and False Beards (UGX 9.6 Million) stand out.

For the 145,649 observations with a complete match between reported exports and imports, statutory rates are below 4% for 50,530 (34.7%), 5 to 15% for 37,587 (25.8%), 15 to 30% for 53,810 (36.9%), and over 30% for 3,722 (2.6%).

## II.2 VAT declarations

Another source of misreporting that we focus on relies on the availability of VAT declarations filed on a monthly basis by Ugandan firms. As mentioned earlier, the VAT is one of the key components of taxes levied on imports. We can observe reports of VAT paid on each consignment at the border by looking at customs declarations in the ASYCUDA data.

Firms meeting a turnover threshold[6] are required to register with and file VAT declarations to the URA. These declarations outline the VAT a firm pays on their purchases (including imports), as well as the VAT they charge on sales each month. For a given calendar month, VAT Act Section 31(1) obliges the registered firm to file information on sales and input payments within 15 days after the end of the month.

The VAT declarations include a field for the "assessment number" of each imported consignment. Within a year, each assessment number is unique, and we can use it to match entries for the amount of VAT paid on imports in a firm's customs declarations (ASYCUDA) and their VAT declarations (Schedule 3). We denote this comparison as:

$$VATGap_{iat} = VAT_{iat}^{Schedule\ 3} - VAT_{iat}^{ASYCUDA}$$

Specifically, the VAT gap captures a discrepancy between the VAT payment reported in a VAT declaration (Schedule 3) by firm *i* on an imported consignment with assessment number *a* that is assessed in time period *t* (month or year), and the corresponding value reported in a customs

[6] According to the Ugandan Value Added Tax Act Section 7(1), firms face an annual registration threshold of UGX 150 million. A person may register as VAT Taxpayer within 20 days after fulfilling a quarter (UGX 37.5 million) turnover threshold for a three month period, or at the beginning of a three month period in which a person expects turnover exceeding a quarter of threshold amount.

declaration (ASYCUDA) by the same firm *i* for a consignment with the same assessment number *a* assessed in the same time period *t*. Relative to the trade gaps, we can calculate the VAT gaps at a more disaggregated level, allowing us to capture a rich set of assessment characteristics associated with each gap, including the identity of the customs clearing agent, details about the importer, and the assigned inspection lane.

### VAT gap sample overview

Covering calendar years 2010-2020, we have a total of 1,178,934 matched assessments. 158,663 (13.5%) of these assessments refer to consignments that include multiple item types–e.g., a container that contains both Organic Surface Active Agents (10% Tariff) and Articles of leather apparels (25% Tariff). Among well-matched observations, we have 301,128 (25.5%) that come from EAC member states. For 10,700 (0.9%) of these data points, we observe different effective VAT rates for customs and VAT declarations (e.g., 18% in ASYCUDA and 0% in Schedule 3), which may occur due to unobservable incentive schemes or special exemptions in the filing process. Our final matched dataset contains 4,152 unique 8-digit *Harmonized System* product categories imported from 162 trading partners, including the EAC member states. We restrict our main analysis to assessments (i) containing a single product type, (ii) originating from non-EAC countries, and (iii) reflecting equal effective VAT rates in both customs and VAT declarations, which yields a total of 731,697 observations.

**Table 2a. Summary statistics for VAT gap sample**

| | Mean | Standard Dev. | Minimum | Maximum | Count |
|---|---|---|---|---|---|
| Value per consignment | 63.16 | 1,191.69 | 0.00 | 945,603.67 | 731,697 |
| Tax Base in ASYCUDA | 68.38 | 1,193.35 | 0.00 | 945,603.67 | 731,697 |
| VAT in ASYCUDA | 10.01 | 41.45 | 0.00 | 7,498.37 | 731,697 |
| Tax Base in Schedule 3 | 66.68 | 379.54 | 0.00 | 75,521.20 | 731,697 |
| VAT in Schedule 3 | 10.13 | 42.37 | 0.00 | 7,498.37 | 731,697 |
| VAT Gap | 0.12 | 12.85 | -4658.65 | 4,862.57 | 731,697 |
| Log VAT Gap | 0.05 | 1.31 | -21.25 | 22.30 | 731,697 |
| Log VAT Gap, wins. 1% | 0.00 | 0.03 | -0.25 | 0.12 | 731,697 |
| Statutory Tariff Rate | 0.15 | 0.17 | 0.00 | 1.00 | 731,697 |
| Log (1 + Tariff Rate) | 0.13 | 0.13 | 0.00 | 0.69 | 731,697 |

Note: Logarithmic VAT Gaps are calculated by taking the difference of log-transformed VAT values. The log values are calibrated by adding 1, so that if VAT paid is 0, the log value is also 0. We also present the 1% winsorized VAT Gaps, where we adjust the top and bottom 1% of Log VAT gaps to account for the potential influence from extreme values. All values are expressed in Ugandan Shilling (UGX) amounts.

**Table 2b. Summary statistics for VAT gap sample**

| | Mean | Standard Dev. | Minimum | Maximum | Count |
|---|---|---|---|---|---|
| Per Export Country (M USh) | | | | | |
| Avg. Annual Import | 136.65 | 1,038.31 | 0.10 | 30,533.87 | 1,103 |
| Avg. Annual VAT Gap | 0.12 | 3.50 | -30.67 | 82.38 | 1,103 |
| Per Importer (M USh) | | | | | |
| Avg. Annual Import | 64.83 | 572.90 | 0.00 | 73,500.59 | 21,134 |
| Avg. Annual VAT Gap | 0.30 | 7.27 | -130.71 | 647.23 | 21,134 |
| Per Clearing Agent (M USh) | | | | | |
| Avg. Annual Import | 88.87 | 248.86 | 0.24 | 8736.86 | 3,494 |
| Avg. Annual VAT Gap | 0.01 | 3.67 | -64.76 | 58.28 | 3,494 |
| Per Product (HS 8) (M USh) | | | | | |
| Avg. Annual Import | 63.40 | 325.79 | 0.00 | 37,150.68 | 20,111 |
| Avg. Annual VAT Gap | 0.40 | 6.33 | -226.15 | 304.09 | 20,111 |

For the final matched dataset, we have a detailed image of assessments for 6,530 unique VAT-registered firms that import from non-EAC countries. These firms have cleared 3,586 different 8-digit *Harmonized System* classified products, through 1,287 customs clearance agents. The number of matched single-item non-EAC imports for VAT registered firms has been increasing consistently, with a peak of 86,297 assessments in 2019.

We note that VAT gaps are smaller relative to trade gaps, primarily due to the level of disaggregation for the former. However, the variance in VAT gaps is high, with minimum and maximum gaps appearing large in absolute terms.

We also attempt to address the extensive margin of VAT misreporting, where a VAT payment record appears only in the ASYCUDA database or only in Schedule 3 of the VAT return. Overall, we find 2,038,396 records that only appear in ASYCUDA and 728,447 consignments that only appear in VAT Schedule 3.

VAT filing in our sample often includes errors in important identifiers (i.e., assessment numbers). Importantly, among the 728,447 consignments that only appear in VAT Schedule 3, 432,990 (59%) had an assessment number with an incorrect format (not starting with “A”).

Accounting for mismatches appearing due to mistakes, we find a larger number of consignments that are 'paid yet unclaimed' (i.e., appearing only in ASYCUDA) relative to those that are 'not paid yet claimed' (i.e., appearing only in VAT Schedule 3). We try collapsing the consignments only in ASYCUDA and only in VAT Schedule 3 at the firm-month level. We still find 383,457 observations that only appear in ASYCUDA and 117,860 that only appear in VAT Schedule 3. Even a firm-year level collapse yields 219,430 of the former observations and 41,437 of the latter.

## III. Estimated fiscal cost of tariff evasion in Uganda

In this section, we estimate the fiscal losses incurred from the evasion of tariffs and the VAT on imports, the two most important tax heads levied on imports in Uganda. We provide estimates for two major mechanisms of import tax evasion: (i) underreporting of import values, and (ii) overreporting of VAT paid on imports in VAT declarations. It should be noted that the resulting aggregate fiscal costs are likely to be underestimated, since we apply conservative conditions when computing the losses and do not factor in additional tax heads like excise duties or the withholding tax on imports.

### III.1 Underreporting of imports

The key intuition behind estimating evasion through the underreporting of import values is that positive "trade gaps," as defined above, are suspicious. Specifically, instances where exports reported by a trading partner are higher than imports reported by Uganda are suggestive of fraudulent reporting by Ugandan traders to reduce their tax burden on imported goods. To estimate revenue losses from import tax evasion through underreporting, we restrict the data to product and year combinations for which both Uganda and the relevant trading partner reported trade flows to the United Nations. In these instances, we have both a recorded import flow by Uganda and a recorded export flow by the trading partner for the same product and year. Crucially, since a single discrepancy for a product in any given year may be due to measurement error, we identify products where gaps show up persistently over time. Concretely, we only include product and trading partner combinations for which we find a positive trade gap in a majority of the years for which we have data available.

For the subset of product and trading partner combinations with consistently positive "trade gaps," we multiply the size of each annual gap in value with the applicable statutory tariff rate to estimate the duty lost. In a final step, we calculate VAT loss by multiplying the sum of the trade gap and the corresponding duty by the statutory VAT rate, which is either 18 or 0 percent. Summing these results across partners and products identified by our criterion provides us with an estimate for the annual tariff and VAT revenue lost due to underreporting of import values.

**Example for underreporting values:** In seven out of nine years between 2010-2018, we find that the Uganda-reported value of imports of the product "*Organic Surface Active Products and Preparations for Washing Skin*" (HS 6-digit code 34.0130) from the UK was lower than the UK-reported value of such exports to Uganda. Since the statutory tariff rate applied to this product was 25 percent for most of this period and was raised to 35 percent in 2018 through a *Stay of Application* from the EAC-CET, importers faced a significant incentive to underreport the weight of imported shipments. In fact, our data suggest an average annual duty revenue loss of around UGX 24 million (ca. 6,500 USD). Since a VAT rate of 18 percent also applied to this product, this

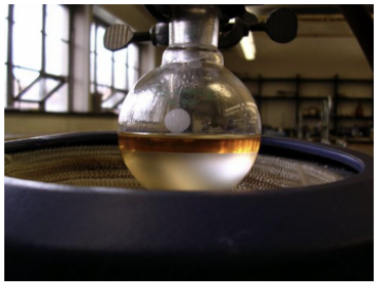
underreporting resulted in an additional average annual VAT revenue loss of UGX 21 million (ca. 5,700 USD), yielding an aggregate annual loss due to the evasion of trade taxes at this product-year level of about 45 million UGX (or about 12,200 USD).

**Figure 1. Example for underreporting import values**

Imports of "organic surface active products" from the United Kingdom

| Year | Ugandan Reports | UK Reports | **Gap** |
|---|---|---|---|
| 2011 | 18,005 | 39,445 | 21,440 (54%) |
| 2012 | 11,389 | 23,673 | 12,284 (52%) |
| 2013 | 33,917 | 29,874 | -4,043 (-14%) |
| 2014 | 11,958 | 42,580 | 30,622 (72%) |
| 2015 | 14,128 | 43,280 | 29,152 (67%) |
| 2016 | 13,958 | 39,861 | 25,903 (65%) |
| 2017 | 922 | 18,810 | 17,888 (95%) |
| 2018 | 7,142 | 12,843 | 5,701 (44%) |

*HS*-code: 34.01.30



**Tariff Rates 25% and 35% from 2017**
(*Stay of Application* from CET)
**Average gap pre 2017: 49%**
**Average gap post 2017:70%**

### Misclassification of imported goods

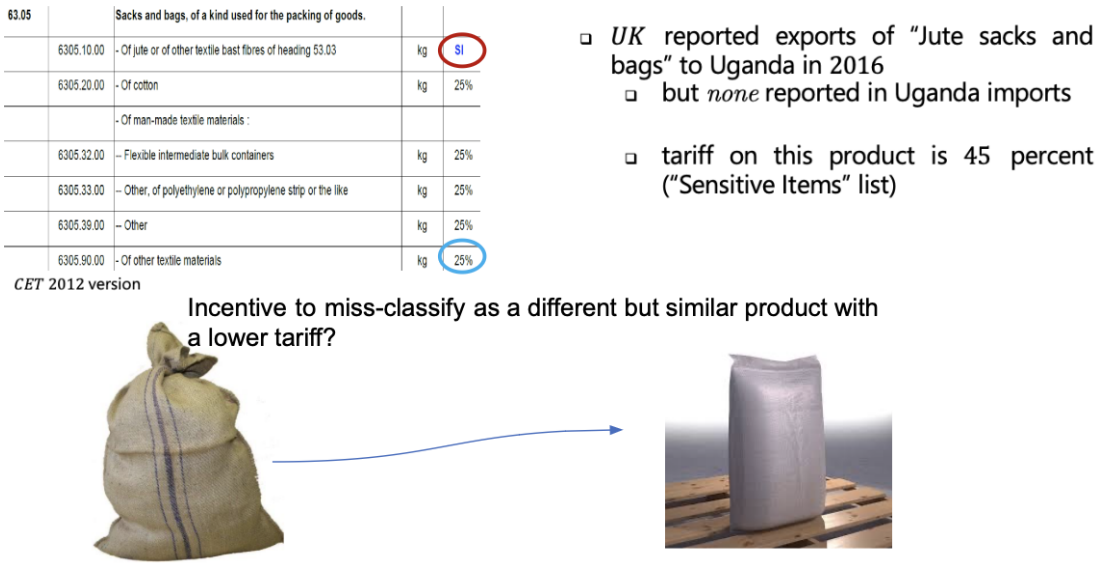
In our data we find a nontrivial number of cases in which a trading partner reports export flows of a product to Uganda, but where we do not find a corresponding record in Uganda's reported imports at all (as opposed to simply a discrepancy in the values). These "orphan exports" may represent a deliberate misclassification of products away from a product subject to high tariff rates to similar products which attract lower or zero tariffs.

To compute an estimate for the revenue loss incurred due to such behavior, we multiply the net weight of each orphan export with the median value per kilogram in UGX for that partner-HS4-year and the appropriate statutory tariff rate for that HS6-year. We then sum up the results by year. Note that these estimates reflect an upper-bound, as misclassified imports may still yield some revenue (though this amount would be higher if the product was correctly classified) if the misclassified category is subject to a nonzero tariff rate.

**Example for suspected misclassification:** In 2016, the United Kingdom reported exports of HS 6-digit code 63.0510 ("*Jute Sacks and Bags*") to Uganda, but there are no reported imports of products under this classification by Uganda in the same year from the UK. The statutory tariff rate for this commodity group was 45 percent in 2016, suggesting that importers were strongly

incentivized to report these products under a different but similar 6-digit code that was subject to lower rates. The potential tariff revenue loss associated with these observations was around 2 million UGX in 2016. According to our statutory VAT schedule, this product was not subject to VAT in 2016.

**Figure 2. Example for suspected misclassification**




## III.2 Over-reporting VAT paid on imports at the border

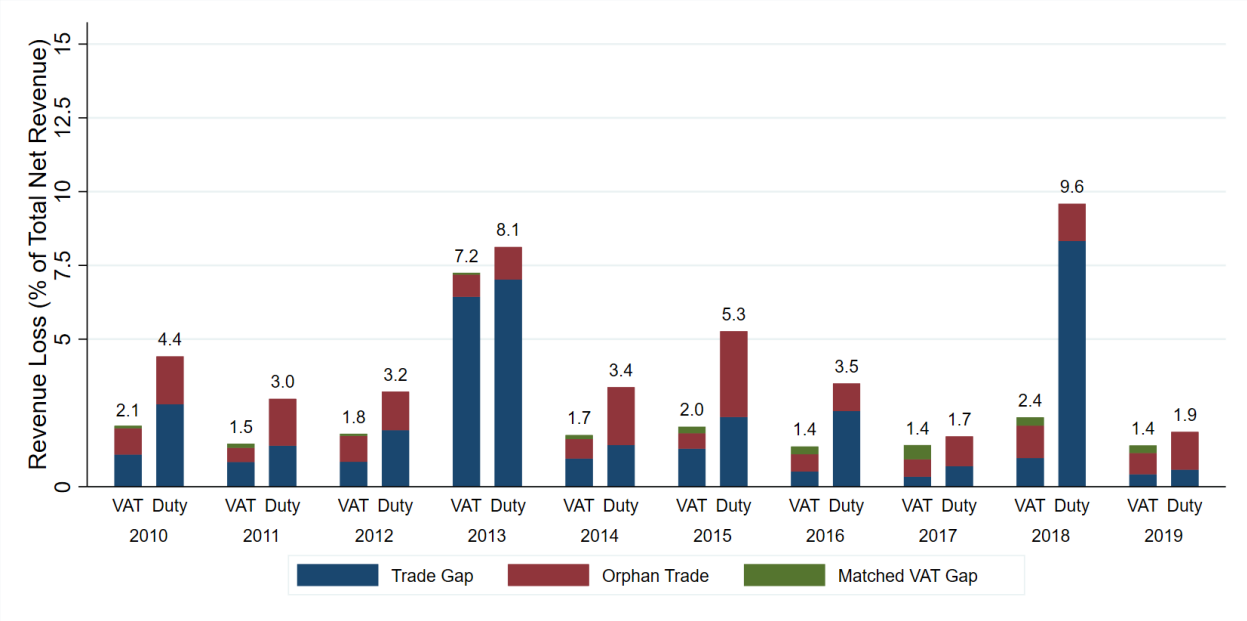
At the border, firms have an incentive to deflate the value of their imports, as this reduces the duty and VAT they owe. However, importers may also try to minimize their net VAT liability by inflating their reports of VAT paid. Any VAT paid on imports at the border counts as a VAT on inputs, which is *subtracted* from VAT received by firms through sales in order to calculate net liability. As a result, the higher the VAT paid on imported inputs, the lower the net VAT liability. Since reports of VAT paid on imports should be the same across customs and VAT declarations, we look for any discrepancies and flag cases where the VAT gap is positive as suspicious.

## III.3 Aggregate estimates

In Figure 3, we combine all mechanisms of evasion considered above into aggregate fiscal losses due to the evasion of tariffs and VAT on imports per year. To illustrate the size of the losses we present these as shares of total net tax revenue collected by the Uganda Revenue Authority in each year. The estimated fiscal losses are sizable. For example, in 2018 the estimated losses from import tax evasion amounted to 9.6 percent of total net tax revenue or about 22.1 percent of trade taxes collected.

These estimates are likely to constitute an underestimate of the fiscal loss from the evasion of import taxes in Uganda for two reasons. First and most importantly, we only compute estimates for two tax heads – tariffs and the VAT on imports – and do not yet factor in other taxes applicable on imports, such as excise duties, the withholding tax, and other fees and charges. Additionally, as detailed in the sections above, we apply fairly conservative conditions when calculating the fiscal losses through different mechanisms of evasion. Nonetheless, the significance of these estimates is clear. Combining the duty and VAT estimates, the loss in 2019 corresponds to about 588 billion UGX. In comparison, the total budget for Uganda's health sector in the 2018/19 fiscal year was 2,310 billion Uganda Shilling (MoFPED 2019).

**Figure 3: Fiscal losses from import tax evasion are sizable as a share of Uganda's tax revenues.**




**Notes:** For this figure, we restrict the data to imports originating from outside the EAC customs union. For the estimates of evasion due to underreporting of import values, we rely only on observations where we have both import and export flows in *UNComtrade*. The misclassification estimates only consider cases where exports were reported without any corresponding imports in *UNComtrade*.

# IV. Drivers of import tax evasion

The sizable estimates of import tax evasion presented in the previous section seem to suggest that combating evasion at customs could increase revenues in Uganda significantly. In this section, we illustrate the power of observable characteristics to predict which shipments are most likely to reveal evasive behavior. Characteristics employed here are available to the Uganda Revenue Authority and can help decision makers assign scarce resources for monitoring to those shipments that are most likely to result in a revenue loss due to fraudulent behavior.

## IV.1 Evasion through underreporting of import values

In Table 1, we employ the standard measure of evasion used in the literature–the trade gap–to replicate and extend a key finding presented in a host of other studies, starting with the seminal Fisman and Wei (2004). As noted before, all data needed to construct the trade gaps at the product, time (month or year) and trading partner level are publicly available.

First, in Column 1 of Table 1 we regress the (log of) the trade gap in monetary values on the (log of) the statutory import tax rate (sum of tariff and VAT rates) applicable on the imported product. We also include time fixed effects to account for factors specific to the month of importation that could affect evasive behavior (e.g., GDP growth in Uganda) as well as country of origin and product fixed effects. The latter absorb variations in the trade gap that are not due to our included tariff variable, but due to trading partner and product specific factors that are time invariant and that could affect the trade gap (e.g., whether or not a product has characteristics that make it hard for customs personnel to detect evasion).

**Table 3. Import taxes as predictors of evasion through underreporting**

| | (1) | (2) | (3) |
|---|---|---|---|
| Ln(1 + Stat. Tax) | 0.851*** | 0.929*** | 0.901*** |
| | (0.271) | (0.222) | (0.215) |
| Duty on Similar Goods | | -0.625** | -0.626** |
| | | (0.293) | (0.284) |
| Observations | 296,712 | 296,422 | 296,422 |
| R-squared | 0.066 | 0.105 | 0.106 |
| Country FE | X | X | X |
| Month-Year FE | X | X | X |
| Product FE | HS4 | HS6 | HS6 |
| Winsorized Gap | | | 1% |

**Notes:** Data is restricted to imports originating from outside of the EAC customs union. Tariff data are collapsed and merged at the partner-HS6-year level from 2010-2020 with trade gaps from *UNComtrade* over the same period. Only observations where neither reported exports nor reported imports were missing in *UNComtrade* are employed.

As evident from the result presented in Column 1, products with higher statutory import tax rates display higher trade gaps between exports reported by Uganda's trading partners and imports reported by Ugandan importers. The point estimates suggest that a 1% increase in the statutory tax rate applied on a product is associated with a trade gap that is about 0.9% percent higher on average. While differences between two accounts of the same shipments may arise due to reasons unrelated to fraudulent behavior, the fact that trade gaps for products subject to high tariffs are systematically higher than those that attract tariffs lower tariffs should count as strong evidence for evasive behavior.

The significance of the coefficients in Columns 2 and 3 suggests that this positive relationship is present for changes in the statutory tax rate for the same HS-6 product category over time, and not only across products within the same HS-4 category with varying tax rates. In Table A1, we decompose the statutory import tax rate into the duty rate and a dummy variable for whether the VAT of 18% was levied on the import. The results suggest that the relationship between

higher statutory rates and larger trade gaps are driven by both the duty rate and the VAT, but the interaction between the two is not significant.

We also find a statistically significant relationship between the average statutory tariff on similar products and the trade gap. Conditional on controlling for a host of other observable characteristics, a higher tariff on similar products is associated with a lower trade gap. As suggested by Fisman and Wei (2004), this result indicates import tax evasion through misclassification, as importers may find it easy to misclassify products as belonging to lower tax categories (HS6) within the same broad product type (HS4).

In Table 4, we look for evidence of bigger trade and VAT gaps when the UGX depreciates relative to the invoicing currency for a consignment. The rationale behind this exercise is that a weaker UGX makes imports more costly for Ugandan firms and represents a tax of sorts, potentially spurring evasive behavior as a cost cutting method.

We acquire monthly exchange rates for UGX to other currencies from the European Central Bank data warehouse, and use a subsample of observations covering 2010 to 2016 for which we have nonmissing currency values. In this case, we match the currencies at a country-level.

**Table 4. Exchange rate fluctuations as predictors of evasion through underreporting**

| | (1) | (2) | (3) |
|---|---|---|---|
| Ln(1 + Stat. Tax) | 0.814*** | 0.904*** | 0.879*** |
| | (0.273) | (0.225) | (0.217) |
| Ln(1 + UGX Exch. Rate) | -0.201*** | -0.198*** | -0.200*** |
| | (0.049) | (0.049) | (0.047) |
| Duty on Similar Goods | -0.598* | -0.645** | -0.642** |
| | (0.306) | (0.297) | (0.288) |
| Observations | 294,052 | 293,760 | 293,760 |
| R-squared | 0.062 | 0.101 | 0.102 |
| Country FE | X | X | X |
| Month-Year FE | X | X | X |
| Product FE | HS4 | HS6 | HS6 |
| Winsorized Gap | | | 1% |

Our results do suggest that a depreciating UGX (lower value of the exchange rate variable) relative to the currency in which the import is invoiced is associated with a larger trade gap. In effect, a weakening shilling seems to be acting as a higher tax on imports.

### IV.2 Evasion through over-claiming of VAT

Aside from the trade gap measurements, we also attempt to identify factors that affect the revenue loss through the VAT overclaiming channel. We focus on the two major variables studied in the previous section: (i) tariff rate variation spilling over to influencing VAT Returns, and (ii) exchange rates playing into losses via a similar channel.

We first look into a possible spillover of duty variation by regressing VAT Gaps on statutory tariff rates. We again apply the fixed effects approach, adding further dummy variables for each firm and each clearing agent, as we have more granular data for the VAT Gaps. We initially attempt this in Column 1 of the following regression table, with the entire matched, non-EAC, single-item sample, where we don't find a significant coefficient estimate suggesting higher gaps for higher tariff rates. We also note that estimates decrease when applying winsorization to top and bottom 1% of VAT gaps, which may suggest a large impact of tail observations.

We then run a separate panel regression by adding interactions of firm and agent dummies with tariff rates, to account for potential heterogeneity in the impact of tariff rates on VAT gaps. Based on these 'slope' fixed effect estimates, we classify firms into two groups: sensitive (with slope fixed effects greater than zero, and thus potentially more evasive on the VAT margin when tariff rates are higher), and insensitive. We classify 1,893 firms (312,144 consignments) as sensitive and 2,168 firms (402,950 consignments) as insensitive. We are unable to classify 2,469 firms that had a very small number of consignments.

**Table 5. Tariffs as predictors of evasion through VAT overclaiming**

| | All Consignments | | Sensitive Group | | Insensitive Group | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Ln(1 + Stat. Tax) | -0.057 | -0.004 | 0.211*** | 0.016*** | -0.229 | -0.018*** |
| | (0.089) | (0.004) | (0.080) | (0.005) | (0.156) | (0.006) |
| Observations | 738,002 | 738,002 | 312,144 | 312,144 | 402,950 | 402,950 |
| R-squared | 0.423 | 0.204 | 0.279 | 0.206 | 0.507 | 0.252 |
| Month FE | X | X | X | X | X | X |
| Year FE | X | X | X | X | X | X |
| Firm FE | X | X | X | X | X | X |
| Agent FE | X | X | X | X | X | X |
| Country FE | X | X | X | X | X | X |
| HS8 FE | X | X | X | X | X | X |
| Winsorized Gap | | 1% | | 1% | | 1% |

Note: Columns are arranged in pairs: Columns 1 and 2 are for all matched consignments from years 2010-2020, Columns 3 and 4 are firms with VAT gaps deemed sensitive to tariff rates, and Columns 5 and 6 are firms with VAT gaps deemed insensitive. Each pair of regressions corresponds to raw VAT gaps and 1% winsorized VAT Gaps.

From this exercise, we find that firms may indeed vary in how their VAT declarations respond to tariff rates. We observe in Column 3 a strong positive coefficient for the sensitive group of firms, whereby a 1 percentage point higher duty rate corresponds to a 0.21% increase in the size of the VAT gaps on average. However, we find a diminished effect size when applying 1% winsorization in Column 4. On the other hand, for the insensitive Group of firms (Columns 5 and 6) we find no significant coefficient before winsorizing.

For the VAT gap and UGX exchange rate analysis, we repeat the sensitivity classification of firms, finding that a substantial number (58,959 / 402,062) of consignments that were previously assigned into the sensitive group are now classified as insensitive. We repeat this exercise due to us using a subset of data from 2010 to 2016 which we have an exact original invoicing currency in our dataset, where 92% of invoicing currencies are US Dollar. In Table 6, we find that the potential widening of evasion through the exchange rate channel may indeed be present for the sensitive group of firms. We first look into all possible currencies, where we find a 0.12% increase in the VAT gap on average as a result of a 1% depreciation of the UGX. Again, the size of this effect decreases substantially when winsorizing gaps at the 1% level, which gives us a 0.004% estimate at a 5% significance level. When restricting to the 375,953 consignments that are originally invoiced in USD, we again find a negative coefficient estimate for exchange rates that is mildly statistically significant for the sensitive group of firms.

**Table 6. Exchange rate fluctuations as predictors of evasion through VAT overclaiming**

| | All Consignments | | Sensitive Group | | Insensitive Group | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Ln(1 + Stat. Tax) | -0.128 | -0.010* | 0.881*** | 0.035*** | -0.165 | -0.011* |
| | (0.115) | (0.005) | (0.252) | (0.009) | (0.120) | (0.006) |
| Exc. Rate | -0.021 | 0.000 | -0.116** | -0.004** | 0.012 | 0.001 |
| | (0.031) | (0.001) | (0.057) | (0.002) | (0.034) | (0.001) |
| Observations | 408,637 | 408,637 | 87,658 | 87,658 | 305,801 | 305,801 |
| R-squared | 0.316 | 0.234 | 0.235 | 0.295 | 0.387 | 0.237 |
| Curr. FE | X | X | X | X | X | X |
| Firm FE | X | X | X | X | X | X |
| Agent FE | X | X | X | X | X | X |
| Country FE | X | X | X | X | X | X |
| HS8 FE | X | X | X | X | X | X |
| Winsorized Gap | | 1% | | 1% | | 1% |

Note: Columns are arranged in pairs: Columns 1 and 2 are for all matched consignments from years 2010 - 2016 with currency data columns available, Columns 3 and 4 are firms with VAT gaps deemed sensitive to tariff rates, and Columns 5 and 6 are firms with gaps deemed insensitive. Each pair of regressions corresponds to raw VAT gaps and 1% winsorized VAT Gaps on the LHS. We would like to note that in here we have not added the Month and Year Fixed Effects that identify the dates, because unlike in the previous analysis, we have a dataset shaped with 92% of invoice currencies being USD, and date Fixed Effects end up identifying the exchange rate variable near perfectly collinear and we lose the statistical power. We are able to retrieve similar results when we rather use country-based exchange rates matches where we have relatively more balanced country-panels.

In general, we find weaker relationships for VAT gaps and tax rates relative to trade gaps. This could be related to the fact that VAT returns are filed after ASYCUDA assessments of actual tax payments appear, which allows the URA to monitor return claims in theory. VAT rebate claims may also pose a risk of audit, making the overclaiming VAT channel less preferable.

## V. Policy Suggestions: Targeting

Based on our current results, we focus our policy suggestions on how the URA can use measured gaps to improve risk profiling. The aggregated trade gap analysis and measurement of VAT gaps would allow the URA to have a systematic method of mirroring available records to detect behavior suggestive of evasion for major tax heads such as the customs duty and VAT on imports. We would demonstrate this using an example of "Other Footwear with Outer Soles and Uppers of Rubber or Plastics" (HS Code 640299, EAC CET rate 25%) imported from China.

Looking into the record for this item from 2011 to 2018, we observe a consistent positive trade gap based on the difference between the UN COMTRADE export record from China and ASYCUDA import records in Uganda. Although the size of the gaps relative to the trading partner's reports decreases in later years, the gaps remain large in absolute terms.

**Table 7. Imports of "Other Footwear of outer soles and uppers of rubber…" from China (UGX)**

| Year | Ugandan Reports | China Reports | Trade Gap |
|---|---|---|---|
| 2011 | 3,898,879 | 39,478,801 | 35,579,922 (90%) |
| 2012 | 4,169,646 | 41,282,617 | 37,112,971 (90%) |
| 2013 | 9,385,828 | 46,609,237 | 37,223,409 (80%) |
| 2014 | 18,036,524 | 47,105,906 | 29,069,382 (62%) |
| 2015 | 6,372,539 | 45,843,959 | 39,471,420 (86%) |
| 2016 | 13,896,241 | 57,919,227 | 44,022,986 (76%) |
| 2017 | 27,750,270 | 50,964,774 | 23,214,504 (46%) |
| 2018 | 44,284,559 | 60,678,770 | 16,394,211 (27%) |

Based on this, the URA could assign stronger enforcement for imports of this product from China in the future. Although we do not have information on consignment-level gaps, the URA could prioritize the consignments of this item of Chinese-origin based on the reported value, as in the following table.

**Table 8a. Prioritizing "Other Footwear of outer soles and uppers of rubber…" from China**

| Country | Year | HS6 Code | Value Rank* | Assessment # |
|---|---|---|---|---|
| CN | 2020 | 640299 | 1 | A###### |
| CN | 2020 | 640299 | 2 | A###### |
| CN | 2020 | 640299 | 3 | A###### |
| CN | 2020 | 640299 | 4 | A###### |
| CN | 2020 | 640299 | 5 | A###### |
| CN | 2020 | 640299 | 7 | A###### |
| CN | 2020 | 640299 | 7 | A###### |
| CN | 2020 | 640299 | 8 | A###### |
| CN | 2020 | 640299 | 9 | A###### |
| CN | 2020 | 640299 | 10 | A###### |

In addition to targeted enforcement based on aggregate trade gaps, we also suggest holistic monitoring of import tax evasion. For instance, the URA could monitor not only losses from lower taxes collected at customs, but also misreporting leading to lower tax liability, e.g. through VAT declarations. In the example above, we find a substantial VAT gap of UGX 4.2 Mllion for one of the footwear consignments that arrived in 2020 from China. This gap represents additional revenue that could be generated if reports were true at the border and consistent in VAT declarations later on.

**Table 8b. Priority assignment for "Other Footwear of outer soles and uppers of rubber…" from China (simultaneously considering VAT Gaps)**

| Country | Year | HS6 Code | Value Rank* | Assessment # | VAT Gaps |
|---|---|---|---|---|---|
| CN | 2020 | 640299 | 1 | A###### | 0 |
| CN | 2020 | 640299 | 2 | A###### | 0 |
| CN | 2020 | 640299 | 3 | A###### | 0 |
| CN | 2020 | 640299 | 4 | A###### | 0 |
| CN | 2020 | 640299 | 5 | A###### | 0 |
| CN | 2020 | 640299 | 6 | A###### | 0 |
| CN | 2020 | 640299 | 7 | A###### | 4,218,706 (8%) |
| CN | 2020 | 640299 | 8 | A###### | 0 |
| CN | 2020 | 640299 | 9 | A###### | 0 |
| CN | 2020 | 640299 | 10 | A###### | 0 |

Finally, information on macroeconomic conditions, including the Ugandan Shilling's exchange rate to other currencies could be used to anticipate potential increases in evasive behaviors. For instance, in 2022, the UGX depreciated 7% between February and August against the US dollar, which may prompt the URA to focus its attention on details such as items that are mostly invoiced in this currency based on trade gaps, or firms that have revealed sensitivity of their VAT reporting, as measured by VAT gaps, to exchange rates.

## VI. Concluding remarks and next steps

In this paper we showcase the value of available tax and trade data to combat import tax evasion in Uganda. With the continued importance of trade taxes and a considerable revenue shortfall due to the Covid-19 crisis, improving tax collection on imports through better risk management procedures and enforcement carries significant importance. We close with four steps for future research:

- The fiscal loss estimates in this note only include tariffs and the VAT on imports as two taxes levied on imports. The methodology should be expanded with other tax heads (excise duty, withholding tax etc.)
- As suggested by our results, Customs Clearing Agents could provide a powerful lever to combat the evasion of import taxes. To better understand the procedures of the agents a survey of customs clearing agents would be helpful.
- Linking different tax admin data sets to study tax evasion more broadly. This will provide a powerful perspective on tax evasion in Uganda by allowing us to compare firm-level reports of similar variables at different stages of the tax declaration process to flag "high risk firms".
- What would be the observable difference in compliance between the Authorized Economic Operator clients (agents and importers of a privileged status because of a good compliance record) vs agents without such status?

These four potential expansions are significantly demand-driven, given the URA's comments and suggestions after discussing the gap measurements in-depth. The personnel we discussed these results with include the Assistant Commissioner of Research and Innovation, the Assistant Commissioner of Customs Enforcement, the Assistant Commissioner of Compliance and Business Analysis, and the Commissioner of Customs. We also had discussions with the Customs Valuation Team and Managers/Officers in the Customs Department to gather insights on what further analysis could help tax-collectors on the field.

# Appendix

**Table A1. Duty and VAT as predictors of evasion through underreporting**

| | (1) | (2) | (3) |
|---|---|---|---|
| Ln(1 + Duty Rate) | 1.124** | 0.835** | 0.761* |
| | (0.480) | (0.418) | (0.394) |
| VAT Dummy | 0.283*** | 0.216*** | 0.209*** |
| | (0.061) | (0.045) | (0.044) |
| Duty x VAT | -0.737* | -0.523 | -0.461 |
| | (0.397) | (0.330) | (0.305) |
| Duty on Similar Goods | -0.301 | -0.253 | -0.263 |
| | (0.326) | (0.326) | (0.316) |
| Observations | 296,712 | 296,422 | 296,422 |
| R-squared | 0.066 | 0.105 | 0.106 |
| Country FE | X | X | X |
| Month-Year FE | X | X | X |
| Product FE | HS4 | HS6 | HS6 |
| Winsorized Gap | | | 1% |

**Notes:** Data is restricted to imports originating from outside of the EAC customs union. Tariff data are collapsed and merged at the partner-HS6-year level from 2010-2020 with trade gaps from *UNComtrade* over the same period. Only observations where neither reported exports nor reported imports were missing in *UNComtrade* are employed.

www.theigc.org