

COMBATING CUSTOMS REVENUE FRAUD IN WCO ESA REGION: A MIRROR ANALYSIS THROUGH THE LENS OF MALAWI

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Abstract

Pursuant to 2017 WCO theme of data analysis for effective border management, the paper focuses on Customs taxes and employs a mirror trade statistics to expose goods in which fraud is significantly suspect. It further categorizes the type of fraud existent in goods being imported into Malawi from major trading partners in WCO-ESA region. The paper conducts the mirror analysis of Malawi against South Africa, Tanzania and Zambia, which accounted for 98% of Malawi's imports from WCO ESA region in 2015. The analysis reveals that revenue fraud in Malawi Customs is significant in products like motor vehicles, motor vehicle spare parts, food preparations, beauty makeups, Portland cement and fabric. The study finds that the fraud takes the form of misclassification, smuggling, undervaluation and overvaluation. Interestingly, the study unearths potential overvaluation in duty free products like fertilizers and raw materials, which are often neglected due to their low revenue intensity. This points to potential capital flight and transfer pricing manipulation. The analysis further quantified Customs revenue losses in selected products that were imported in 2015. The study proposes special audits and investigations in the goods with significant mirror gaps in order to drill down, quantify and get to combat the revenue fraud. This will enhance the risk profiles, boost the post clearance audits and effectively reduce revenue fraud in Malawi. A fraud control plan has been suggested and it will see Malawi Customs establishing a fraud control system that strengthens the risk management unit, facilitate trade by reducing physical controls at the border and ultimately seal revenue leakages in a smart and cheap way.

1. INTRODUCTION

Domestic resource mobilization through taxation is key for a country's stable growth and development. In Malawi, the need for more tax revenues became even more important in 2011/12 Fiscal Year (FY) when the Common Approach to Budgetary Support (CABS) was indefinitely suspended due to governance issues. The donor budgetary support accounts for over a third of the total national budget and the suspension negatively affected Malawi's economy and the government was forced to implement a zero deficit budget.¹ This stagnated the country's growth and development and with a budget deficit of 4.3% of the Gross Domestic Product (GDP) in 2014/15, coupled with a tax ratio of only 15.9% of GDP in 2015/16, there is a critical need for Malawi Revenue Authority (MRA) to ensure that tax revenues are thoroughly collected and that revenue fraud is identified and minimised.²

Revenue collection by Customs administrations remains a strategic priority for many developing countries. However, MRA Customs division is currently succumbing to the contemporary tax challenge of declining revenues from import duties mainly due to trade liberalization. For instance, in 2004/2005 FY, the percentage contribution of Customs revenue to the total revenue basket was 52%, which later dropped to 33% in 2016/17 FY.³ Inevitably, this problem is not only pertinent to Malawi but also other members of the World Customs Organization (WCO) - East and Southern Africa (ESA) region, and replacing the lost revenues is usually a challenge.⁴ Therefore, it is

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¹ Karl Pauw, Paul Dorosh, John Mazunda, 'Exchange Rate Policy and Devaluation in Malawi,' *Social Science Research Network*, 20 March, 2013, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2235683, (accessed 06/02/2018).

² World Bank, Emerging Stronger: 'Malawi Economic Outlook,' October, 2016, available at <http://documents.worldbank.org/curated/en/994621478685605311/pdf/109965-REVISED-PUBLIC-Malawi-Economic-Monitor-4-final-published-Nov-10-2016.pdf> (accessed 25th January 2018).

³ Author's own manipulation using Customs data obtained from Malawi ASYCUDA World.

⁴ Padamja Khandelwal, 'COMESA and SADC Prospects for Regional Trade Integration' (December, 2004) IMF, working paper No. 4/227 <https://www.imf.org/external/pubs/ft/wp/2004/wp04227.pdf> (accessed 13 December, 2017).

imperative that Malawi Customs administration and its regional partners guard against all forms of Customs revenue fraud that bleed revenue.

Historically, revenue collection has been the core function of Customs administration besides other contemporary functions like trade facilitation and securing the supply chain.⁵ Unfortunately, the World trading system has fast undergone a major transformation with rising trade volumes and introduction of more complex business systems and logistics processes. These challenges overwhelm Customs administrations and related stakeholders thereby undermining service delivery along the supply chain. Moreover, the resources afforded to Customs administration are also becoming inadequate to effectively handle the expanded roles. These complexities allow for revenue fraud to go undetected, unless more innovative data analytics and intelligence methods are employed.

Cognizant of the strategic importance of revenue in its member countries, the WCO established a revenue package tool in order to ensure efficient and effective revenue collection. It further developed various tools that assist in reducing revenue risks and gaps in Customs operations. An example of such a tool is mirror analysis. According to Cantens,⁶ mirror analysis involves the comparison between import (or export) data of country A and the data for imports to (or exports from) country B by one or more countries. The resultant trade discrepancies adjusted to other factors,⁷ indicate potential Customs revenue fraud.

Several studies have used mirror analysis in trade analysis to trace and estimate tax evasion. For instance, Bhagwati⁸ employed mirror trade statistics to show the effect of under (over) valuation in of trade statistics on balance of payment in Turkey. Similarly, Fisman and Wei⁹ examined the link between tariff schedule and evasion gap in China. Their study, found that a 1% point increase

⁵ Luc De Wulf, 'Human Resources and Organisational issues in Customs,' in Luc De Wulf and Jose B. Sokol (eds), *Customs Modernization Handbook: Case Studies* (World Bank, 2005) pp 31.

⁶ Thomas Cantens, 'Mirror Analysis and Revenue Fraud' (April, 2015) WCO research paper No. 35 http://www.wcoomd.org/en/topics/research/activities-and-programmes/~/_media/9F730547EF794600ADB7B2012BB5EE63.ashx (accessed 5 April 2017).

⁷ The trade discrepancies are adjusted to factors like f.o.b and c.i.f. This is further discussed in the study methodology.

⁸ Bhagwati Jagdish, 'Fiscal Policies, the Faking of Foreign Trade Declarations, and the Balance of Payments' (1967) 29(1), *Bulletin of the Oxford University Institute of Economics and Statistics*, pp 61-77.

⁹ Raymond Fisman and Shang-Jin Wei, 'Tax Rates and Tax Evasion: Evidence from Missing Imports in China,' (2004) 112(2) *Journal of Political Economy* 471-496.

in the tax rate was associated with a 3% increase in evasion. Interestingly, the study established that the evasion took the form of misclassification and under invoicing.

This study purports to build on this literature by employing mirror trade statistics¹⁰ to expose goods in which Customs revenue fraud is suspect specifically in imports from Malawi's major trading partners in the WCO ESA region. This is achieved by quantifying and evaluating irregularities in trade data in order to isolate risky commodities. The study goes further to categorise the types of Customs fraud existent in the identified goods and the associated revenue loss. This study aims to complement the Malawi Customs efforts in countering revenue fraud by informing its assessment and targeting of risky consignments through which revenue leakage occurs.. The paper further demonstrates how Customs administrations can efficiently use the readily available huge chunk of often-underutilized Customs data and turn it into value through data analytics and mining.

The main objective of the study is to detect, classify and approximate Customs revenue fraud in Malawi's imports from its main trading partners in WCO ESA region. Pursuant to the main objective, the study will seek to: (i) identify products in which significant Customs fraud is suspect; (ii) understand the Customs fraud mechanism that is used; (iii) quantify potential revenue losses in high revenue yielding goods.

The significance of this study is that it will help Customs officers assess, identify and target risky goods and eventually develop helpful profiles for risk analysis that will effectively reduce revenue risks. In the same vein, the study will also direct the focus and functions of Post Clearance Audits (PCA) and enforcement in Customs compliance checks, inspection and investigation. Ultimately, this will ensure that physical control of merchandise at the border is effectively reduced thereby facilitating smooth trade. This is a cost efficient way of minimizing revenue leakages, as it will ensure that resources are efficiently channeled to where they are required the most. The study will also be critical to other WCO ESA countries, who still rely on Customs revenue as a major source of national revenue,¹¹ and can easily be replicated to address their revenue challenges. To the economic operators, the paper provides key lessons on how Customs revenue fraud affects them and as to how they can support initiatives aimed at combating such fraud.

¹⁰ Mirror analysis is also known as partner country method because it involves comparison of trade data between two trading partner countries.

¹¹ Padamja Khandelwal, above n 6, 4.

The rest of the study is organized as follows: the succeeding section brings forth the institutional background of Malawi Customs in relation to WCO ESA and this is followed by literature review in section three. Research methodology and analysis are discussed in section four and five respectively. Section six gives the recommendations and conclusion to the study.

2. INSTITUTIONAL BACKGROUND OF MALAWI CUSTOMS ADMINISTRATION

Malawi is predominantly a consuming and importing country. Therefore, imports revenue remain a strategic way of financing the government. This section discusses the structure of imports and trade patterns with its WCO ESA trading partners. It further discusses the modernisation initiatives employed by MRA to leverage on the power of data and strengthen its operations.

2.1 The role of Malawi Customs and Structure of Malawi's Imports

The Customs and Excise division of the MRA is primarily mandated to collect Customs revenue, which accounts for about 35% of MRA's total revenue collection.¹² Other roles include facilitation of legitimate trade, enforcement of exports proceeds, collection of international trade statistics and protecting the society. The division administers three main types of taxes namely: import duties, import value added tax, and import excise.¹³ Malawi is mainly a net importer with product groups like; raw materials, consumer, intermediate and capital goods accounting for a larger proportion of imports. As of 2015 the trade deficit was at US\$707 million and imports of both goods and services accounted for 36% of GDP.¹⁴ In 2015, most of Malawi's imports were from the Republic of South Africa (RSA), China, India, United Arab Emirates (UAE) and Zambia. The top imported products ranged from petroleum products, chemical fertilizers and medicaments.¹⁵

2.2 Digitalization, Data Analytics and Business Intelligence

¹² Malawi Revenue Authority, <http://www.mra.mw/custom-and-excise/about-customs> (accessed 8 February, 2018).

¹³ Ibid.

¹⁴ World Integrated Trade Solutions (WITS), <https://wits.worldbank.org/CountryProfile/en/Country/MWI/Year/LTST/> (accessed on 8th February 2018).

¹⁵ Ibid.

The vision of Malawi Revenue Authority (MRA) Customs is *'[T]o be a modern, proactive Customs administration that adapts to the challenges of a changing environment thereby achieving and maintaining excellence in service delivery to all stakeholders'*. Cognizant of this vision and of course in line with international best practices as specified in the Revised Kyoto Convention (RKC), the division has been pursuing various modernization initiatives in order to improve its predictability and efficiency in service delivery. For instance, in 2000 the division automated the clearance procedure through implementation of an UNCTAD's Automated System for Customs Data (ASYCUDA) 2.7, which was later upgraded to ASYCUDA ++ in 2004. Currently, MRA Customs uses ASYCUDA World, which was rolled out to all its major border stations in 2016.

In line with MRA's strategic goal of business process re-engineering, in 2015 it rolled out a Business Objects Business Intelligence (BOBI/BI) system. This is a technology that consolidates data from various units in MRA and enables easy analysis of the data to assist users make proactive business decisions. This initiative enabled comprehensive reporting and provided a common ground for operation of MRA's internal stakeholders that for long were operating in silos. All these initiatives have availed large volumes of data, which can be used for business analytics and intelligence for informed policy direction.

2.2 Malawi's Trade with WCO ESA Member Countries

According to African Development Bank (ADB), intra-regional trade among African countries remains poor with only about 16% of African trade being within the continent in 2014.¹⁶ Furthermore, the trade among African countries is mostly dominated by Africa's biggest economies.¹⁷ All this is confirmed in table 1 which presents Malawi's top trading partners in the WCO ESA region who reported their exports to Malawi from 2014 to 2016.

¹⁶ADB, 'Intra-African trade is key to sustainable development – African Economic Outlook' <https://www.afdb.org/en/news-and-events/intra-african-trade-is-key-to-sustainable-development-african-economic-outlook-17022/> (accessed 7 February, 2018).

¹⁷ UNECA, 'Assessing Regional Integration in Africa IV: Enhancing Intra-African Trade' (May, 2010) Economic Commission for Africa (ECA) available at <https://www.uneca.org/sites/default/files/PublicationFiles/aria4full.pdf> (accessed 10 April, 2017).

Table 1: Imports to Malawi's as reported by Top Trading Partners in WCO ESA Region from 2014 to 2016

Partner Country	Annual Trade Values in 1,000 US\$				% Share
	2014	2015	2016	Total	
South Africa	409,406	327,224	361,275	1,097,906	67.27
Zambia	147,970	107,289	122,518	377,778	23.15
Tanzania	41,291	56,132	30,788	128,212	7.86
Zimbabwe	4,752	3,468	4,235	12,456	0.76
Botswana	2,292	1,607	1,725	5,623	0.34
Namibia	1,822	393	109	2,324	0.14
Madagascar	167		4	171	0.01
Mauritius	95	59	66	220	0.01
Rwanda	81	72	905	1,058	0.06
Ethiopia(excl.Eritrea)	25	199		224	0.01
Uganda	8	56	30	93	0.01
Burundi			8	8	0.00
TOTAL	609,924	498,514	523,679	1,632,118	100.00%
WCO ESA % share of ROW	43%	41%	47%	44%	
% share of top the 3	98%	98%	98%	98%	

Source: UNCOMTRADE data from WITS

As illustrated by table 1, out of the 24 WCO ESA member countries, only 12 reported UNCOMTRADE to have exported to Malawi in the 3-year period. This might be due to a number of reasons. Firstly, some countries do not necessarily report their trade statistics for each and every year and UNCOMTRADE does not estimate the missing data.¹⁸ Secondly, it might be the reason that a particular WCO ESA member did not trade with Malawi or did so to insignificant levels and

¹⁸ WITS, Checking data availability in UNCOMTRADE <https://wits.worldbank.org/wits/wits/witshelp/content/Basics/A6.COMTRADE-Catalog.htm> (accessed 7 February, 2018).

as such the data is not available. The latter reason can of course be crosschecked with the local imports data. These reasons are also the limitations of UNCOMTRADE dataset, which should always be borne in mind during mirror analyses.

Malawi's total imports from the WCO ESA region as reported by member countries is on decline from US\$ 609 million in 2014 to US\$523 million in 2016. This trend is largely driven by RSA, which accounted for over 67% of imports that Malawi made from the WCO ESA region. This was followed by Zambia and Tanzania at 23% and 7% respectively. Ultimately, the top 3 trading partners accounted for 98% of imports that Malawi made from the WCO ESA region. These statistics confirm two main findings by UNECA on intra-regional trade in Africa.¹⁹ Firstly, trade among African countries is dominated by few big economies like RSA. Secondly, intra-regional trade is low due to poor infrastructure development and connectivity, which makes transportation of merchandise expensive. This is also observed in table 1, as two of the main exporters to Malawi are neighbouring countries namely Tanzania and Zambia. On average, WCO ESA region's exports to Malawi accounted for 44% of the total imports made by Malawi from the rest of the World.

Against this backdrop, the study focuses on the three top countries that accounted for the largest proportion of Malawi's imports (98%) in the year 2015.²⁰ As already illustrated in table 1, the countries are RSA, Zambia and Tanzania.

3. LITERATURE REVIEW

Mirror analysis has its roots in seminal work by Bhagwati who used mirror statistics to demonstrate that products with severe mirror gaps in Turkey were attracting higher duty rates suggesting that tax evasion was partly explained by high tariff rates.²¹ Fisman and Wei reinforced this finding using data from China and they found that a 1 % increase in tax rates is associated with a 3% increase in tax evasion.²² They further detected fraud mechanism to be in form of under-invoicing and misclassification of imports from higher taxed goods.

¹⁹ UNECA, above n 19, 10.

²⁰ The main focus of this study is the calendar year of 2015 hence unless otherwise stated, all statistics relate to the year.

²¹ Bhagwati Jagdish, 'On the Under invoicing of Imports'. (1964) 27(4) *Bulletin of the Oxford University Institute of Economics & Statistics*: pp. 389–97.

²² Raymond Fisman and Shang-Jin Wei, above n 11.

Most of the studies relating to mirror analysis had not comprehensively tackled Customs revenue fraud specifically how Customs officers can reduce it in practice. However, recently there have been some studies that are directly useful to Customs practice in combating fraud, for instance Raballand, Cantens and Arenas used Cameroon’s Customs data and UN COMTRADE data to test how mirror trade statistics can be used to improve revenue collection and decrease fraud through application of an experimental risk analysis design.²³ Their study found that mirror trade statistics can be used for operational controls like classifying and quantifying systematic Customs revenue fraud. On the same token, the Italian Customs and Monopolies Agency also employed mirror trade statistics to identify undervaluation of imported textiles.²⁴

Revenue fraud, general as it may be, needs to be further classified for it to be meaningful. Against this backdrop, a study conducted by Chalendard, Raballand and Rakotoarisoa proposes the use of ratio and gap indicators of fraud to help establish whether the fraud is in form of smuggling, undervaluation or misclassification.²⁵ The gap indicators of fraud include the trade gap and weight gap, which is the reported export value (weight) less reported import value (weight). The significance of these indicators is that they enable estimation of losses thereby enabling prioritization. On the other hand, ratio indicators are categorized into ratio of weights, ratio of values and a ratio of density values and they are calculated as follows:

$$\text{Ratio of value} = \frac{\text{reported import value (US\$)}}{\text{reported export value (US\$)}} \dots\dots\dots(1)$$

$$\text{Ratio of weight} = \frac{\text{reported import weight (kg)}}{\text{reported export weight (kg)}} \dots\dots\dots(2)$$

$$\text{Ratio of density values} = \frac{\text{ratio of values}}{\text{ratio of weights}} \dots\dots\dots(3)$$

²³ Gael Raballand, Thomas Cantens and Guillermo Arenas, ‘Mirror Trade Statistics: A Tool to help identify Customs Fraud’ in Thomas Cantens, Robert Ireland and Gael Raballand (eds), *Reform by Numbers: Measurement Applied to Customs and Tax Administrations in Developing Countries*, (The World Bank, 2012) pp: 103-20.
²⁴ WCO, ‘Undervaluation of Textiles: Italian Experience’ (Revenue Package Phase II, 2015) <http://www.wcoesarocb.org/wp-content/uploads/2017/03/12-Undervaluation-of-textiles-italian-report-FINAL-EN.pdf> (accessed 7 February, 2018).
²⁵ Cyril Chalendard, Gael Raballand and Antsa Rakotoarisoa, ‘Use of Detailed Statistical Data in Customs Reforms: The Case of Madagascar’ (World Bank Group policy research working paper No. 7625, April 2016). Available at: <http://documents.worldbank.org/curated/en/512741468196174563/pdf/WPS7625.pdf> (accessed 10 April, 2017).

The study further asserts that these indicators coupled with knowledge of the effective taxation of imports can collectively reveal forms of revenue fraud to be either smuggling, undervaluation or misclassification, as well as possible revenue losses. For instance, if equation 2 is close to unity and equation 1 and 3 yield low than unity values, it is a sign of undervaluation. Furthermore, if equation 3 yields values close to unity and equations 1 and 2 are lower than unity, it suggests misclassification or a possible case of smuggling.²⁶

4. RESEARCH METHODOLOGY

The study closely follows Chalendard et al., and Cantens by adopting mirror analysis methodology in order to unearth traces of revenue fraud between MRA Customs and its top importing WCO ESA trading partners. Mirror analysis involves the comparison between import data of a country and the data for imports to the country.²⁷ Thus, in the case of this study, mirror trade statistics entails the computation of the differences between exports to MRA Customs reported by WCO ESA member countries and imports locally reported by Malawi Customs for the same type of goods. This enables the study to ultimately identify sectors or products in which Customs revenue fraud is significant by way of detecting trade gaps which are essentially the difference between exports to Malawi reported by the WCO ESA trading partner and imports from the exporting country as reported by Malawi Customs.

The mirror analysis methodology is warranted as it permits an objective approach of complementing the traditional methods of conducting risk analyses like intuition, experience and intelligence. Thus, as echoed by Cantens,²⁸ the methodology helps to comprehensively detect, classify and quantify many forms of fraud so that they are pursued and treated in totality. However, Nitsch,²⁹ has criticised mirror analysis by pointing out that researchers tend to interpret the mirror gaps too quickly and restrictively without considering other factors like differences in classification which might explain the gap. Another possible reason for trade gaps relates to discrepancies due to expressing imports as cost, insurance and freight (CIF) and exports as free on

²⁶ Ibid

²⁷ Thomas Cantens, above n 8, 4.

²⁸ Ibid

²⁹ Nitsch Volker, 'Trade Mispricing and Illicit Flows' in Peter Reuter (Ed) *Draining Development? : Controlling Flows of Illicit Funds from Developing Countries* (World Bank, 2012) pp: 309-34.

board (FOB) (see Yeats).³⁰ It is for this reason that despite the mirror analysis posing as a strong tool in analysing Customs revenue fraud, it has to be treated with caution.

To achieve its objectives, the study compared export (mirror) trade data extracted from UN COMTRADE database using WITS (World Integrated Trade Solutions) software and import data extracted from Malawian Customs ASYCUDA system. Thus, the paper presents fraud diagnosis using mirror analysis with RSA, Tanzania and Zambia and the year of analysis is 2015. This year was chosen because complete data for the year before the incumbent year may not be readily available as countries may report to WITS later in the year.³¹

The UN COMTRADE allows for an analysis at a disaggregated Harmonised System (HS) 6 digit level, 4 digit level as well as 2 digit level. According to Chalendar et al,³² the more disaggregated the unit of analysis is in terms of HS code, the higher are the chances that the resulting mirror gap value is not solely attributable to fraud. Therefore, for the purposes of this study, HS 4 digit level using the HS 2012 nomenclature is adopted in carrying out the fraud diagnosis.

Gap indicators in terms of trade and weight gap best provide the quantitative estimate of the revenue fraud, and as such they are a guide towards sectors with potential fraud. Malawi's imports are captured in CIF and the Customs Single Administrative Document (SAD) captures imports data in both FOB and CIF. Therefore, FOB-CIF adjustment was not required on the import data to make it comparable to the export data reported by partner countries in FOB. This helped us maintain some level of precision in the data. However, the import FOB values were in various foreign currencies i.e. Rands for South Africa, Kwacha for Zambia and Shillings for Tanzania. Therefore, the values were converted into US\$ using the 2015 average exchange rates as provided by World Bank in the 2015 World Development Indicators (WDI) series. The weights were all in kilograms hence were directly comparable. The data cleaning and manipulation was done using Microsoft Excel as the size of the data permitted use of spreadsheet.³³ At first, we worked with

³⁰ Yeats Alexander, 'On the Accuracy of Economic Observations: Do Sub-Saharan Trade Statistics Mean Anything?' (1990) 4(2) *The World Bank Economic Review*.
<http://documents.worldbank.org/curated/en/644121468767677708/pdf/multi-page.pdf> (accessed 7 February, 2018).

³¹ Thomas Cantens, above n 8, 8.

³² Cyril Chalendar, Gael Raballand and Antsa Rakotoarisoa, above n 27.

³³ Thomas Cantens, above n 8, 10. Strongly advises use of statistical of database management software like Stata or R. This is because spreadsheets require extensive pre-processing for each analysis, which is worsened with big data size.

most disaggregated level (HS 6-digit) in order to separately establish positive and negative differences. Then the product codes were collapsed to aggregated levels (HS 4-digit) for ease of analysis.

Initially, we computed gap indicators for both trade values in US\$ and net weight in kgs. This computation allowed us to establish the quantitative estimate of the fraud. We then sorted and separated the sectors or products with positive trade gaps from those with negative differences.³⁴ These gap indicators assist in estimating the losses in value and facilitate prioritization. Thereafter, ratio indicators were also computed in order to facilitate categorization of fraud into whether the type of fraud is potentially misclassification, undervaluation or smuggling.

Following Chalendar et al,³⁵ when the ratio of weights close to unity goes together with low ratio of density values, it indicates probability of undervaluation. When the ratio of density values close to unity combined with the ratio of weights and ratio of values that are lower than unity it suggests misclassification or smuggling. Table 2 and 3 present all the scenarios of Customs revenue fraud classification with the use of ratio indicators. The study follows these tables to detect and classify fraud between Malawi and the three WCO ESA members. Furthermore, where possible, revenue loss estimates are also quantified on products whose effective tax rates were computable.

Table 2: Types of Fraud according to Ratio Indicators

ValueRatio → Weight Ratio ↓	<1	1	>1	Density ↓ Value Ratio
<1	M-, S & U			<1
1	U			
>1	M+, U	M+	M+, SO & U	1
<1	S, M-			
1		E		
>1			M+, SO	>1
<1	N.C	N.C	N.C	
1			O	
>1			M+, SO & O	

³⁴ Trade gaps are also known as ‘mirror gaps’.

³⁵ Cyril Chalendar, Gael Raballand and Antsa Rakotoarisoa, above n 27.

Source: Adapted from table 18 of Chalendard et al (2016)

Table 3: Descriptions of Abbreviations Used in Table 2.

Abbreviation	Description
E	Expected i.e. no fraud
M-	Misclassification: the product is declared under another heading
M+	Misclassification: Under this product, other products are misclassified
O	Overvaluation
S	Smuggling into country of import
SO	Smuggling into country of origin/export
U	Undervaluation
N.C	Not Consistent
&	and
	Impossible

Source: Adapted from table 19 of Chalendard et al (2016)

5. RESULTS AND ANALYSIS

This section presents results for the mirror analysis conducted between Malawi and each of the three identified WCO ESA members. We focus on products that had significant positive and negative mirror gaps as well as those which were deemed to have a significant bearing on Customs revenue. The results are presented in 4-digit product code, which will also be referred to as sectors.³⁶ Other products were left out either because of their sensitivity, insignificant trade gap as well as data unavailability and inconsistencies. It is imperative to note that fraud can take place within the sector or between them; therefore the results ought to be interpreted and taken with caution.

³⁶ Following Chalendard et al (2016) consider a consistent cluster of two digit HS codes as sectors.

5.1 Mirror Analysis between Malawi's and Republic of South Africa in 2015

Table 4: Trade Gaps and Ratio Indicators for selected products imported from RSA

Product Code	Commercial Product Description	Trade gap 1,000 US\$	Value ratios	Weight ratios	Density value ratio
8708	Motor vehicle spare parts	2489.8	0.7	0.8	0.8
1512	Sunflower seed/cotton seed oil	1306.3	0.6	0.6	1.0
1901	Malt extract, infant milk	698.0	0.7	1.2	0.6
3401	Soaps	386.2	0.8	0.9	0.9
2202	Juices, sweetened water	-301.5	1.1	1.2	0.9
4011	New pneumatic tyres	-593.9	1.2	1.5	0.8
2712	Petroleum jelly , wax	-936.8	1.4	1.1	1.2
2106	Food preparations	-1750.5	1.4	1.8	0.8
3102	Fertilizers	-3192.0	1.6	1.2	1.3
3902	Polymers of polypylene	-5946.0	1.8	1.5	1.2
8703	Vehicles for transport of persons	-15493.3	3.9	4.1	1.0

Source: Author's computations from UNCOMTRADE and ASYCUDA

5.1.1 Undervaluation

According to table 4, we suspect that there was also undervaluation of motor vehicles spare parts (HS: 8708), new pneumatic tyres (HS: 4011), malt extracts and infant milk (HS: 1901), juices, sweetened water (HS: 2202) and food preparations (HS: 2106). We zero in on motor vehicle spare parts because in practice most of them are imported from RSA. The trade gap in this sector was US\$2.5 million implying that RSA reported to have exported a lot yet Malawi reported less in terms of value. In Malawi, these products attract a duty rate of 25% and a maximum excise duty rate of 15% and import VAT of 16.5%. As such, MRA Customs might have lost about US\$1.6 million in revenue.³⁷

5.1.2 Misclassification and Smuggling

³⁷ We apply an effective tax rate of 67% on the trade gap to estimate the potential duty loss.

Sunflower or cotton seed oil (HS: 1512), motor vehicle spare parts (HS: 8708), new pneumatic tyres (HS: 4011), flavoured and sweetened waters (HS: 2202), and food preparations (HS: 2106) were some of the products that were potentially misclassified and smuggled. Under these sectors, other products were also misclassified implying that other products were disguised as belonging to these group of products. Specifically, soaps (HS: 3401) and sunflower oils were potentially misclassified under wrong heading and were also prone to pure smuggling.

Interestingly, chemical fertilizers (HS: 3102), polymers (HS: 3902) and motor vehicles for transport of persons (HS: 8703) were either smuggled into the country of origin, misclassified or overvalued and they all recorded negative trade gaps. Fertilisers in Malawi are duty free and zero rated implying that VAT charged on inputs relating to the fertilisers may be claimed as input tax. So, the incentive of overvaluation fraud may relate to the need to claim more VAT or money laundering. On the other hand, polymers are duty free but VAT is payable, so the only possible incentive of traders overvaluing them is to externalise forex, conduct money laundering or simply transfer pricing manipulation especially where related parties are involved. Therefore, it is imperative to further investigate these products by comparing the import prices with international prices at importer level as they are often ignored due to their low revenue intensity.

One notable and important sector that involved a lot of Customs fraud was vehicles for transport of persons (HS: 8703). These goods registered a negative trade gap of US\$15.5 million and they were subjected to smuggling into the country of origin and under these products some goods were misclassified. In Malawi, these products attract high rates of duty: import duty ranging from 25% to 30%; import excise duty ranging from 15% to 100% and a flat import VAT rate of 16.5%. Therefore, traders have an incentive to reduce the tax burden. Importers can also enjoy duty exemptions if they present SADC certificates of origin that a particular good originates from RSA. So, it is unsurprising to see that some of these goods were disguised as having originated in RSA or having belonged to this sector.

5.2 Mirror Analysis between Malawi's and Zambia in 2015

Table 5: Trade Gaps and Ratio Indicators for selected products imported from Zambia

Product Code	Commercial Product Description	Trade gap 1,000 US\$	Value ratios	Weight ratios	Density value ratios
3406	Candles, wax	415.1	0.4	0.6	0.7
1704	Sugar confectionaries	252.4	0.9	1.0	0.9
2523	Portland Cement	212.5	0.8	0.9	0.9
3208	Paints and vanishes	134.4	0.6	0.8	0.8
2202	Waters, sweetened, flavoured	-41.7	1.1	1.0	1.1
2009	Juices	-220.0	1.7	1.6	1.0

Source: Author's computations from UNCOMTRADE and ASYCUDA

5.2.1 Undervaluation

Goods from Zambia that were potentially undervalued in 2015 include: Portland cement (HS: 2523); candles, waxes (HS: 3406) and sugar confectionaries (HS: 1704). Portland cement is one of the most contentious products in the sense that Malawi has local producers of the same product but Zambian cement is usually cheaper. Therefore, traders import Portland cement from Zambia, which attracts a duty rate of 10%, and imports VAT of 16.5%. In the year 2015, there was a positive trade gap of US\$ 212 thousand implying that Zambia reported to have exported more than what Malawi recorded to have imported. This lost value translates into potential Customs revenue loss of US\$ 37.5 thousand.³⁸

5.2.2 Misclassification and Smuggling

Some of the products that were misclassified and smuggled in 2015 were juices (HS: 2009), sweetened or flavoured waters (HS: 2202), paints and varnishes (HS: 3208) and Portland cement. Malawi's border with Zambia is very porous such that smuggling is rampant. Most of the traders

³⁸ Effective rate on Portland cement from Zambia is 17.6%

are also small-scale traders. It is therefore unsurprising to find out that smuggling is indeed one form of the Customs fraud that prevailed in 2015 between these two countries.

5.3 Mirror Analysis between Malawi's and Tanzania in 2015

Table 6: Trade Gaps and Ratio Indicators for selected products imported from Tanzania

Product Code	Commercial Product Description	Trade Gap 1,000 US\$	Value ratios	Weight ratios	Density value ratios
2712	Petroleum jelly	1994.1	0.0	0.0	0.3
3304	Beauty make up preparation	607.8	0.6	1.1	0.5
3401	Soaps	502.9	0.7	0.7	0.9
1518	Animal/vegetable fats	88.1	0.8	0.9	0.9
4804	Toilet or facial tissue	54.8	0.8	0.8	1.0
2523	Cement	-347.8	1.1	1.1	1.0
6304	Furnishing articles	-2039.5	2.9	1.0	2.9
5208	Woven fabric	-4114.2	76.8	5.6	13.8

Source: Author's computations from UNCOMTRADE and ASYCUDA

5.3.1 Undervaluation

As can be deciphered from table 6, undervaluation was potentially suspect in sectors like petroleum jelly (HS: 2712), beauty make up preparations (HS: 3304), soaps (HS: 3401) and animal or vegetable fats (HS: 1518). Imperative to note, all these products posted positive trade gap in 2015. Of particular interest is sector HS: 3304-beauty or make up preparations for the care of the skin. Malawi imports a significant amount of these products from Tanzania but they attract high duty rates; 25% import duty, 10% excise duty and 16.5% import VAT. This is probably why it is prone to undervaluation. The lost value, which amounted to US\$608 thousand, imply that Malawi potentially lost revenue in excess of US\$ 365 thousand in revenue.³⁹

5.3.2 Misclassification and Smuggling

³⁹ Effective tax rate for such products was calculated to be 61%.

Misclassification was suspect in all the products from Tanzania that are shown in table 6. Specifically, soaps (HS: 3401), animal or vegetable fats (HS: 1518), and petroleum jelly were potentially misclassified under different headings. On the other hand, woven fabric (HS: 5208), furnishing articles (HS: 6304) and cement (HS: 2523), which recorded negative trade gaps, were potentially smuggled into the country of origin. Thus, some of these products were masqueraded to have originated from Tanzania while in true sense they had not.

6. RECOMMENDATION

The study provides pointers as to which goods from which sectors to focus on and conduct a further mirror analysis on in order to combat Customs fraud in Malawi. Based on the findings, the study proposes a fraud control plan that should target the identified main cases. This initiative can be conducted by the enforcement, post clearance audit in conjunction with the risk management team. These identified products need to be subjected to serious scrutiny and the risk profiles ought to be updated accordingly so that the goods are thoroughly and periodically subjected to Customs checks. It is always imperative to confirm the suspicions of fraud by consulting those on the ground; therefore, field investigations needs to be conducted to confirm the findings of this study. This would ensure that more information is gathered on how revenue fraud in the goods can best be tackled. This will ensure that mirror analysis acts as an aide-de-camp to existing risk identifying strategies and will better orient Customs officers at the borders. In the same vein, the study can easily be replicated by other WCO ESA members to identify and combat fraud in their administrations.

The main contemporary challenge of a typical Customs officer is balancing between border controls and trade facilitation. In developing countries like Malawi, where Customs operations are more revenue oriented, officers are more likely to forego risk management practices and increase the intensity of physical control of goods at the border. Mirror analysis, can help solve this problem and cheaply provide intelligence on suspicious trade flows to frontline officers. Since it involves much of data mining and document validation than physical control of goods at the border, it further acts as a critical trade facilitation tool.

One of the contemporary aspects that is often overlooked by Customs is that of transfer pricing in relation to Customs valuation. This is often practiced by related party transactions in order to

facilitate capital flight. Sometimes, capital flight can be achieved through over-invoicing in order to externalise fund in form of buying various goods. These aspects do not form the core functions of Customs hence, more often than not, they are side-lined. Against this backdrop, the study unearthed and suspected traces of capital flight in form of either over-invoicing or transfer pricing. As the world becomes even more complex and border security becomes even more diverse, the future role of Customs will expand. For this reason, it is imperative that Customs emphasises on capital flight investigation by at least identifying and reporting to responsible persons for further analysis. Customs is better positioned to carry out such functions because it is at the fore where it is easier to suspect transactions.

Economic operators as critical stakeholders in the global supply chain ought to appreciate the importance of revenue to Customs in developing countries. A mirror analysis at importer level complemented with the style of this study would be an ideal way of establishing the compliance and revenue risk of economic operators in their daily operations. Thus, mirror analysis will likely shape the operations of Customs in addressing Customs related fraud as it is a powerful investigative and intelligence tool. Therefore, it is imperative for economic operators to ensure integrity in their daily operations and engage in activities that would help reduce Customs revenue fraud.

5. CONCLUSION

The study employed mirror analysis to unearth products in which Customs revenue fraud was significantly suspect especially on Malawi's imports from its major trading partners in WCO ESA region in 2015. This was better permitted by a synthetic analysis of gaps indicators and ratio indicators. The former assisted in identifying and quantifying the potential Customs fraud in products in which fraud was suspect and the latter assisted in helped in establishing the type and mechanism of the fraud. The study has stimulated debate on Customs fraud and has provided directions for further investigations and scrutiny in order to identify and seal revenue leakages that are experienced by Malawi in relation to WCO-ESA trading partners. The major weakness of this study is that trade/mirror gaps are attributable to various reasons ranging from CIF-FOB adjustment to error or lags in reporting trade data. This study could not separate the impact of each

of these possible explanations. Nevertheless, the study worked on literature's assertion that a significant part of mirror gaps is attributed to fraudulent trade flows.

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