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Orphan Imports and Lost Exports in India's Trade: A Quantitative Assessment of the Significance and Implications for Illicit Financial Flows

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ABSTRACT

Orphan imports and lost exports refer to import and export transactions that have been reported by only one of the two trading partners. They are excluded from computations of trade mis-invoicing based on comparing partner country trade statistics. We show that India's trade with 19 trading partners over 2000-2018 not only indicates substantial trade mis-invoicing but also significant orphan and lost trade in the commodities displaying mis-invoicing. We also show that the amounts involved show an uptrend and are more pronounced in imports, with the orphan imports recorded by India being more than 15 times the orphan imports recorded by partner countries. Therefore, any conclusion on illicit flows through mis-invoicing in these commodities will be incomplete without analysing the impact of orphan and lost trade. We analyse some possible causes and discuss specific commodity-level examples to demonstrate that orphan and lost trade could not only lead to re-adjustment of computed amounts of trade mis-invoicing but, in the worst scenario, indicate serious fraud, with important implications for illicit flows. The paper's finding that only a few commodities account for bulk of the amounts in orphan and lost trade could facilitate better analysis and mitigation measures.

Key Words: Illicit Financial Flows, Trade Mis-invoicing, Round tripping of funds, Orphan Imports, Lost Exports

INTRODUCTION

One of the popular methods of computing the Illicit Financial Flows is the Partner Country Method (PCM), which is based on a comparison of the trade data reported by the two trading sides and treating the differences as proxy for the illicit flows through trade. For example, if country A reports import of $1000 from country B, while the corresponding export reported by country B is $800, the difference of $200 could be on account of export under-invoicing by B (value transferred to country A through export was more than the export proceeds reported to the authorities in B-an illicit outflow) or import over-invoicing (the funds transferred out of country A was more than the value of imports). While using the PCM, care is taken to discount the import values, reported on CIF basis, by a suitable factor, to make it comparable with export

values, which are reported on FOB basis. Based on the IMF Manual, the commonly used discount factor is 10 percent although the IMF has revised it downwards to 6 percent recently.

The databases commonly used for the PCM include the IMF's DOTS and UN's Comtrade databases, both based on the trade data reported by the member countries. The UN Comtrade database contains details of commodities involved in trade transactions, down to their 6-digit HS codes. As trade involves two parties, each trade transaction will be reported twice, separately by the exporting country and the importing country. The export reported by the reporting country will be reported as import by the partner country. In an ideal situation these values should match once the CIF import values have been suitably deflated. However, in reality, the values from both sides do not match and the difference is taken as an indication of mis-invoicing and the associated illicit flows. In addition, in many cases the records have values reported on only side i.e., either the reporter or the partner country. Thus, the transactions reported in UN Comtrade database can be divided into two parts:

a) Trade values reported by the reporter that also have a corresponding value (not necessarily the same) reported by the partner country. We will call them 'Matched transactions'.
b) Trade values that have been reported by only one party -either the reporter or the partner country, without the corresponding matching value reported on the other side. We will call them 'Unmatched transactions'.

Since it is difficult to apply the Partner Country Method to the transaction of type (b), they are usually left out in studies of Illicit Financial Flows. In this paper we examine such one-sided unmatched transactions and their possible implications for the trade gap analysis and the associated illicit financial flows in India's trade with its 19 major trading partners during the period 2000-2018.

SURVEY OF LITERATURE

The existing definitions of IFFs point to two essential elements -(i) cross border financial transfers and (ii) relation with illegal activity (see Forstater, 2018 for a compilation of some important definitions). According to the Global Financial Integrity (GFI) the IFFs take place primarily through trade mis-invoicing (TM). The UN's Economic Commission for Africa (2015) refers to trade mis-pricing as the falsification of price, quality and quantity. Some of the important studies that have used trade data to estimate the TM include McDonald (1985), Fisman and Wei (2004), Biswas and Marjit (2005, 2007), Beja (2006), and Buehn and Eichler (2011).

In the recent years, more emphasis has been given to analysis of data at the product level, rather than aggregated trade data, which tends to under-estimate the trade mis-invoicing due to canceling out of under-invoicing and over-invoicing during the process of aggregation. Carrere and Grigoriou (2014) reported that deliberate misreporting contributes significantly to the trade gaps and ran a probit on orphan imports using HS 6-digit level UN Comtrade data. An UNCTAD study (December 2016) using product level data from UN Comtrade reported substantial misinvoicing in imports and exports of Chile, Zambia, Nigeria, Cote d'Ivoire and South Africa (see also Ndikumana, 2016). Slim and Carton (2018), using UN Comtrade data for 35 OECD countries over the period 2006-2016, concluded that trade mis-invoicing was a

significant factor. Other similar studies include Gara et al. (2018) for Italy's external trade (2010 to 2013) and Cheung et al (2020) for Germany. GFI (2010, 2013, 2014, 2015, 2019) has published a series of studies highlighting illicit financial flows from the developing and under-developed countries to the developed countries through trade mis-invoicing. Nitsch (2016) provided a comprehensive critique of the GFI's estimates of the IFFs from the developing countries and suggested a systematic analysis of observed differences in matched partner trade statistics at the product level.

Of the few available empirical studies on the IFF out of India, the report of the Global Financial Integrity (Kar, 2010) estimated that India lost $213 billion due to IFF during 1948-2008, mostly through trade mis-invoicing. Jha and Truong (2014) calculated the Capital Flight through TM as $186.64 billion for the period 1988-2012. GFI (2019) used the Comtrade data and estimated that India lost revenue of US$13 billion in 2016 due to trade misinvoicing. In this study, GFI excluded the 'unmatched' trade values ascribed to orphan and lost trade. For example, out of reported import of $356.7 billion in 2016, the 'matched' transactions amounted to $ 214.9 billion (60 percent) and out of reported export of $260.3 billion, the 'matched' transactions amounted to $192.8 billion (74 percent). This means that a significant part of the reported data is excluded from drawing conclusions on illicit flows through trade mis-invoicing.

SCOPE, DATA AND METHODOLOGY

The study covers India's trade with 19 of its major trading partners: Australia, China, Hong Kong, Indonesia, Japan, Malaysia, South Korea, Singapore, Thailand (Asia); Belgium, France, Germany, Italy, Switzerland, UK (Europe); Saudi Arabia (Middle East), South Africa (Africa); and Brazil, USA (Americas). These countries accounted for about 59 percent of India's trade in March 2020.

The study uses the trade data from the UN Comtrade (http://Comtrade.un.org/data/) for the period 2000 to 2018. The 6-digit HS Code data for the 19 trade partners contains import and export transactions in 5008 commodities. As Import connotes inflow of goods and outflow of funds while Export connotes outflow of goods and inflow of funds, import under-invoicing (UI) and export over-invoicing (OI) will connote illicit inflows and import over-invoicing and export under-invoicing will connote illicit outflows. If India's import (Mi) from country j is country j's Export (Ej) to India, and India's export to country j (Ei) is country j's import from India (Mj); and the import (CIF) is deflated for insurance & freight to make it comparable with exports, reported on FOB basis, the illicit flows can be depicted as follows:

(1) Illicit Inflow into India: (a) through Import under-invoicing i.e., negative values of [(Mi/a)-Ej] and Export over-invoicing i.e., positive values of [Ei-(Mj/a)]; and
(2) Illicit outflows from India: (a) Import over-invoicing i.e., positive values of [(Mi/a)-Ej] and Export under-invoicing i.e., negative values of [Ei-(Mj/ a)]

Where 'a' is a deflator for converting the CIF import values to an equivalent of FOB exports. The data was analysed using **Tableau** and **MS-Excel**.

The unmatched transactions can be categorized as Lost Exports and Orphan Imports as follows:

1. **Lost Exports:** where the export has been reported from one side but the corresponding import has not been reported from the other side. These can be of two types:

(a) Ei without Mj: transactions in which India has recorded export but the partner country has not recorded the corresponding import.

(b) Ej without Mi: transactions where the partner countries have reported export to India but India has not reported the corresponding import from partner countries.

2. Orphan imports: where the import has been reported by one side without any corresponding export recorded by the other side. These can be of two types:

(c) Mi without Ej: transactions where import has been recorded by India without any corresponding export recorded by the partner country.

(d) Mj without Ei: transactions in which import has been recorded by the partner country without the corresponding export recorded by India.

ANALYSIS AND FINDINGS

India reported more unmatched transactions than partner countries

Of the 1.68 million rows of trade data reported by India, 73 percent had corresponding data reported by the partner countries (matched records), while 27 percent fell under the Unmatched category. In value terms, the percentage was 86 percent Matched and 14% Unmatched (**Table1**).

Table 1: Details of Matched and Unmatched records analysed

	Trade Flow	No. of Records	Trade value ($)	Matched Records (no.)		%	Trade Value $	%	Unmatched Records		%	Trade Value $	%
Reported by India	Import (Mi)	828,259	3185 billion	Mi-matched-Ej	590,966	71	2526 billion	79	Mi-without-Ej	237,293	29	659 billion	21
	Export (Ei)	860,336	1947 billion	Ei-matched-Mj	633,288	74	1868 billion	96	Ei-without-Mj	227,048	26	79 billion	4
	Total	**1,688,595**	**5132 billion**		**1,224,254**	**73**	**4394 billion**	**86**		**464,341**	**27**	**738 billion**	**14**
Reported by Partners	Import (Mj)	824,336	2130 billion	Mj-matched-Ei633288	633,288	77	2088 billion	98	Mj-without-Ei	191,048	23	42 billion	2
	Export (Ej)	720,842	2844 billion	Ej-matched-Mi	590,966	82	2738 billion	96	Ej-without-Mi	129,876	18	106 billion	4
	Total	**1,545,178**	**4974 billion**		**1,224,254**	**79**	**4826 billion**	**97**		**320,924**	**21**	**148 billion**	**3**
				Total matched records	1,224,254								
				Total unmatched records	785,265								
				Total rows of database	**2,009,519**								
Note 1: Matched records are those in which trade values for a commodity have been reported both by reporter and partner country													
Note 2: Unmatched records are those in which trade values for a commodity have been reported by either reporter or partner. These are either lost exports or orphan imports													

(Source: Author's calculations from UN Comtrade data)

The data reported by the partner countries contained 1.55 million rows of trade data, of which 79 percent had corresponding values reported by India (Matched). In terms of value, the percentage was 97 percent (Matched) and 3 percent Unmatched. Thus, the data reported by the partner countries shows a higher percentage of matching, both in terms of the number of rows and the value of trade (**Table 1**).

The percentage of unmatched records reported by India shows a declining trend

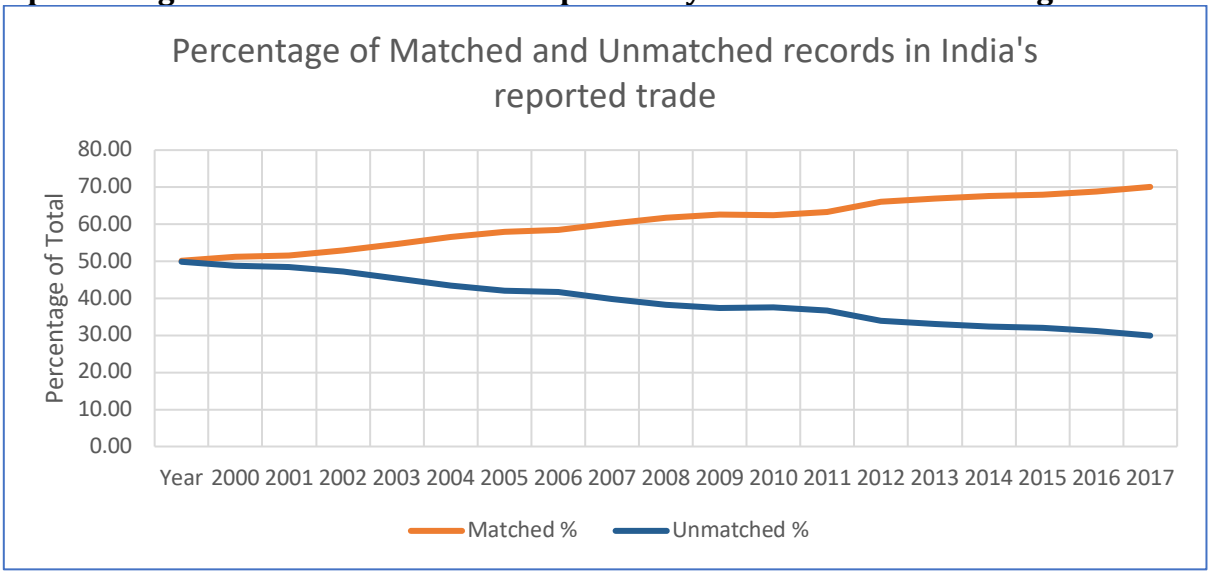


Chart 1: Trend in Matched and Unmatched Transactions
(Source: Author's calculations from UN Comtrade data)

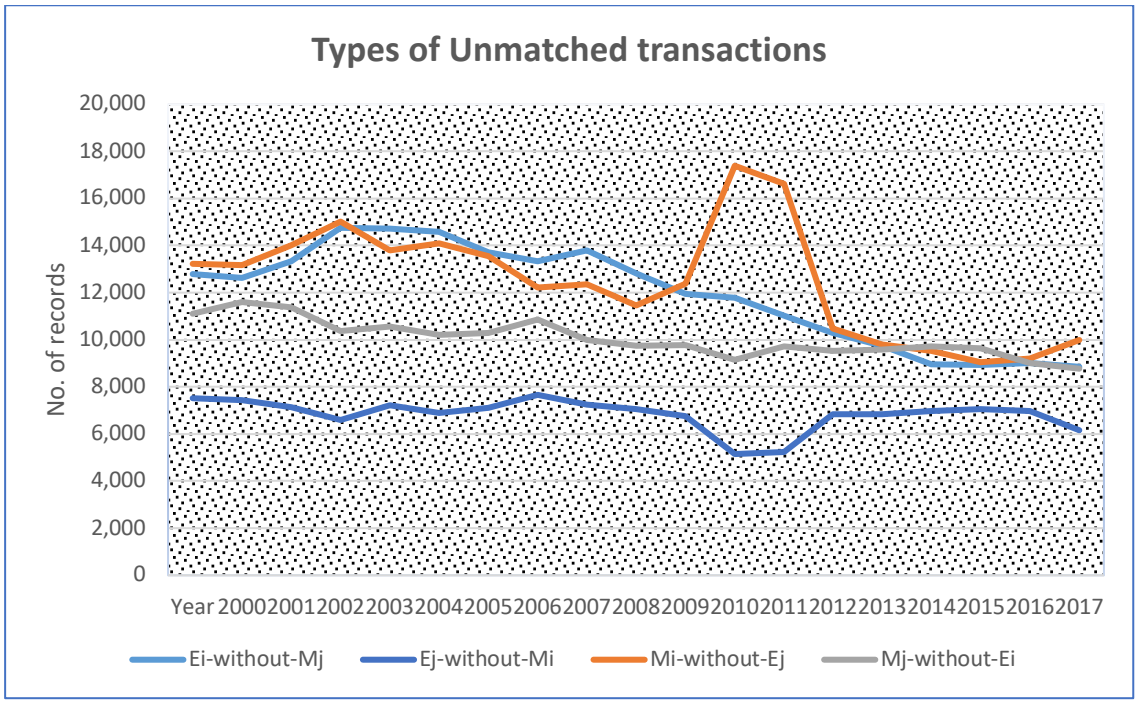


Chart 2: Trend in different types of un-matched transactions
(Source: Author's calculations from UN Comtrade data)

Chart 1 shows that the percentage of unmatched transactions in the trade reported by India has been coming down over the years 2000-2018, which may indicate qualitative improvement in the data reported to Comtrade. **Chart 2** shows similar trend for the four types of unmatched transactions, in varying degrees. **Chart 2** corroborates the conclusion drawn from **Chart 1** that the reporting may have become qualitatively better over time.

The number of records and the amounts of lost and orphan trade are significant

Table 2 shows that the number of records showing lost exports and orphan imports run into thousands of rows and billions of dollars and therefore will have implications for the IFF computed through the Partner Country Method, which relies primarily on matched transactions. Of the four types of unmatched transactions the orphan imports reported by India are the highest, both in the number and amounts. At an intuitive level, the unmatched transactions could partly be as a result of classification errors. For example, a part of the missing Mj in Ei-without-Mj ($78.69 billion) could be accounted for the $42.49 billion Mj in Mj-without-Ei. This relationship is also visible in **Chart 2**, where the sharp rise in the number of records in Mi-without-Ej category during 2011-2013 has a corresponding dip in the number of records in the Ej-without-Mi category in the same period.

Table 2

Trade Type	Amount (US$ billion)	Nos of Rows
Ei-without-Mj (lost export)	78.69	227,048
Mj-without-Ei (orphan import)	42.49	191,048
Mi-without-Ej (orphan import)	659.25	237,293
Ej-without-Mi (lost export)	106.34	129,876

(Source: Author's calculations from UN Comtrade data)

The amount of Lost Exports recorded by India (Ei-without-Mj) shows uptrend

While the number of rows with lost exports (Ei-without-Mj values) shows a downward trend, the values of lost exports show an upward trend over time (**Chart 3**). The maximum amount of lost exports is in case of exports to Singapore ($17.47 billion) followed by Malaysia ($6.05 b), USA ($6.04 b), China ($ 5.59 b) and Saudi Arabia ($4.28 b). The maximum number of rows with lost exports are however seen in the exports to Saudi Arabia, Japan, Hong Kong, USA and Malaysia in that order.

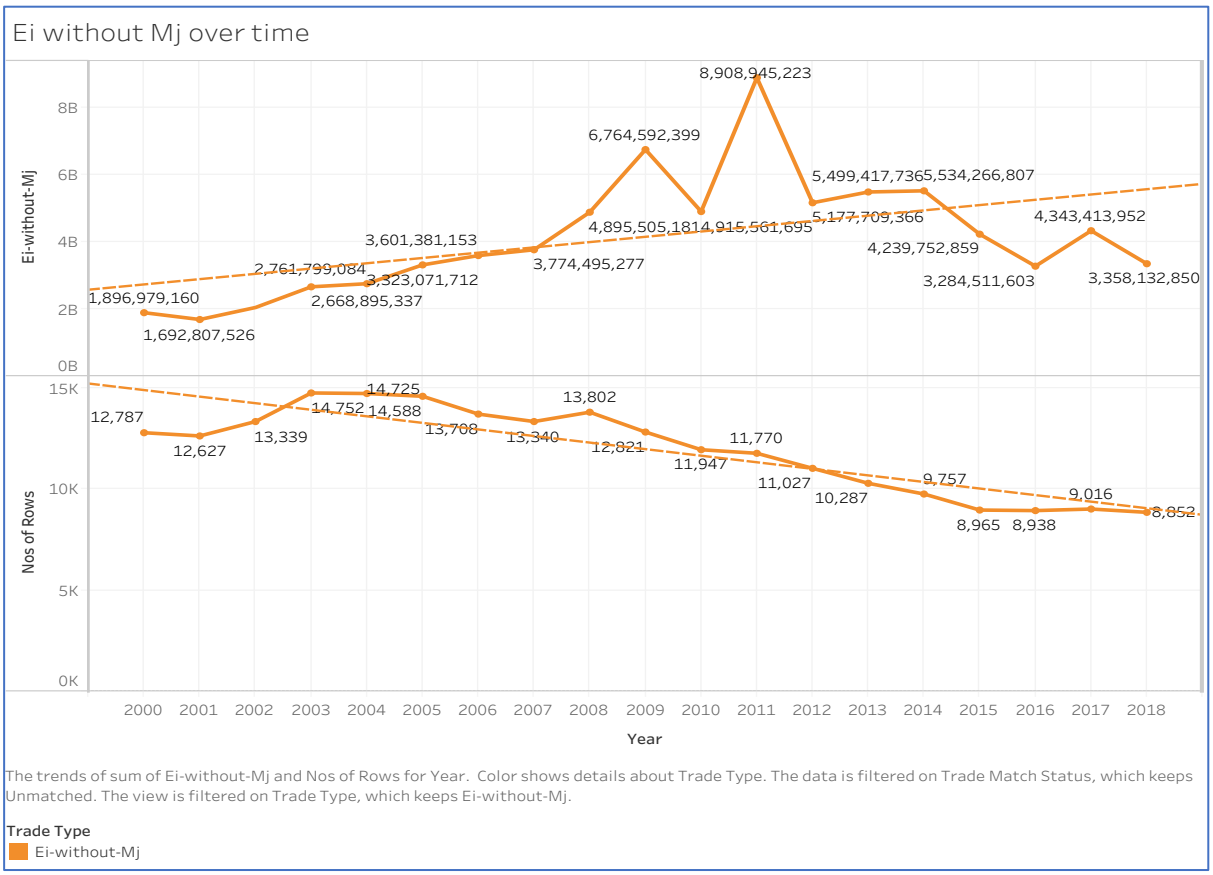


Chart 3: Lost exports recorded by India
(Source: Author's calculations from UN Comtrade data)

Only a small percentage of commodities account for bulk of the value of lost exports reported by India (Ei-without-Mj)

Lost exports were seen in case of 5053 commodities totalling $78.69 billion, ranging from $4 to $6.5 billion. The top 100 commodities account for 66.21 percent of the lost exports while the top 5 commodities accounted for 27.48 percent of the lost exports (**Table 3**).

Table 3: Data pertaining to Ei-without-Mj			
Count:	5053		**% of total (by value)**
SUM (Ei-without-Mj)	78,692,747,915	Top 100 commodities	66.21
Average	15,573,470.79	Top 50 commodities	57.52
Minimum	4	Top 25 commodities	48.38
Maximum	6,527,628,934	Top 5 commodities	27.48
Median	1,673,702.00		
Standard deviation	159,319,749		

(Source: Author's calculations from UN Comtrade data)

The amount of Orphan imports recorded by partner countries (Mj-without-Ei) shows uptrend

There are 4,996 commodities involved with an import value of $42.49 billion over 2000-18 **(Table 4)**.

Table 4: Statistical information about commodities showing Mj without Ei	
Count:	4995
Sum:	42,487,293,255
Minimum:	1
Maximum:	1,549,603,469
Average:	8,505,965
Median:	1,322,050
Standard deviation:	45,197,859

(Source: Author's calculations from UN Comtrade data)

The amount of Mj- without- Ei shows an uptrend over 2000-18, but the number of rows that display orphan imports shows a downtrend (**Chart 4**). Saudi Arabia displays the highest amount of orphan imports (Mj-without-Ei) followed by Singapore, China, UK and USA. However, in terms of the number of rows in which Mj-without-Ei is seen, Switzerland, Thailand and South Africa occupy the top spots.

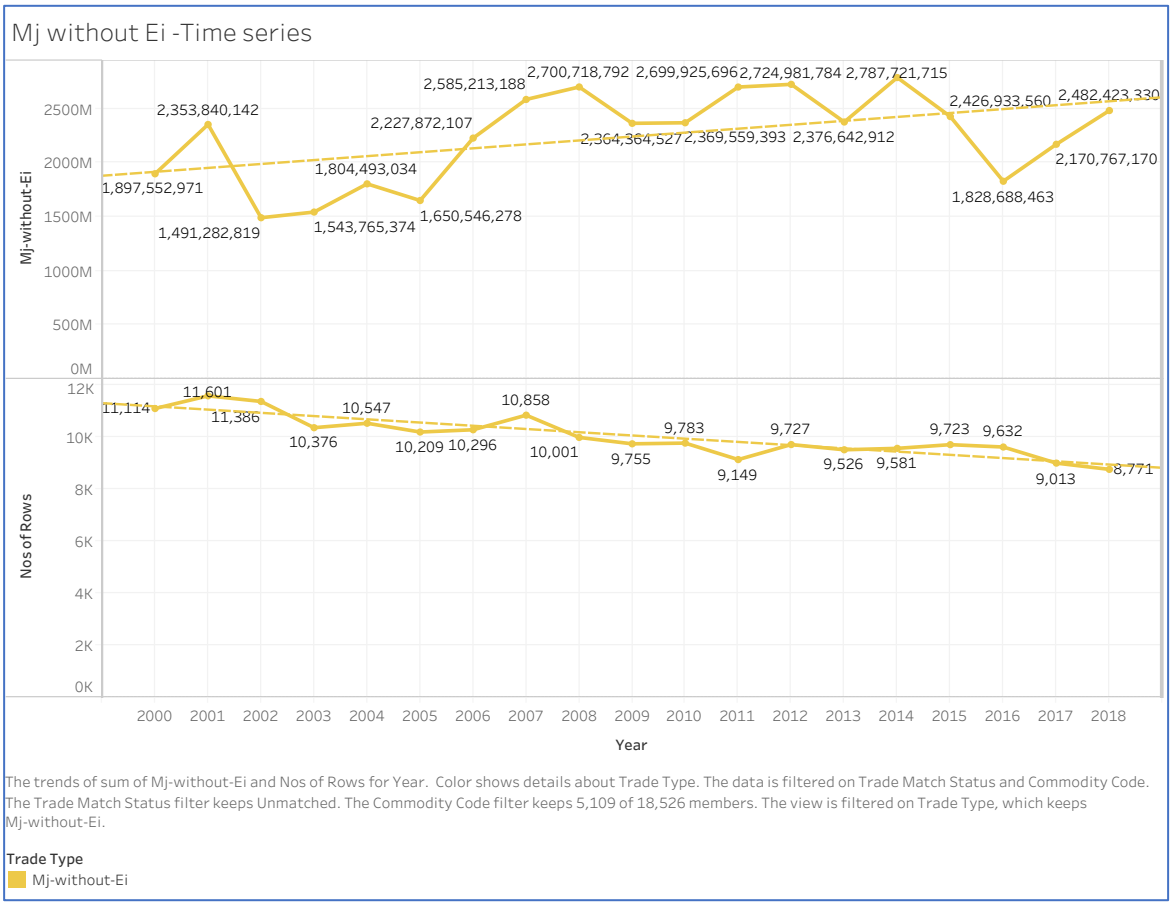


Chart 4: Orphan imports recorded by partner countries
(Source: Author's calculations from UN Comtrade data)

Only a small percentage of commodities account for bulk of the orphan imports recorded by partner countries (Mj without Ei)

Only 2 percent (100 commodities) of the 4995 commodities that display orphan imports (Mj without Ei) account for 50.72 percent of the $42.49 billions orphan imports recorded by the

partner countries (**Table 5**). Of these, top 25 commodities (0.5 percent) account for 30.06 percent of the amount.

Table 5	
Commodities	**Percent of amount**
top 5 (0.1%)	12.28%
top 25 (0.5%)	30.06%
top 50 (1%)	40.23%
top 100 (2%)	50.72%

(Source: Author's calculations from UN Comtrade data)

The amount of Orphan imports recorded by India (Mi without Ej) shows uptrend

While the amount of orphan imports shows uptrend, the number of records with orphan imports shows a downtrend over 2000-18 (**Chart 5**). Note the spike in both in 2010-12.

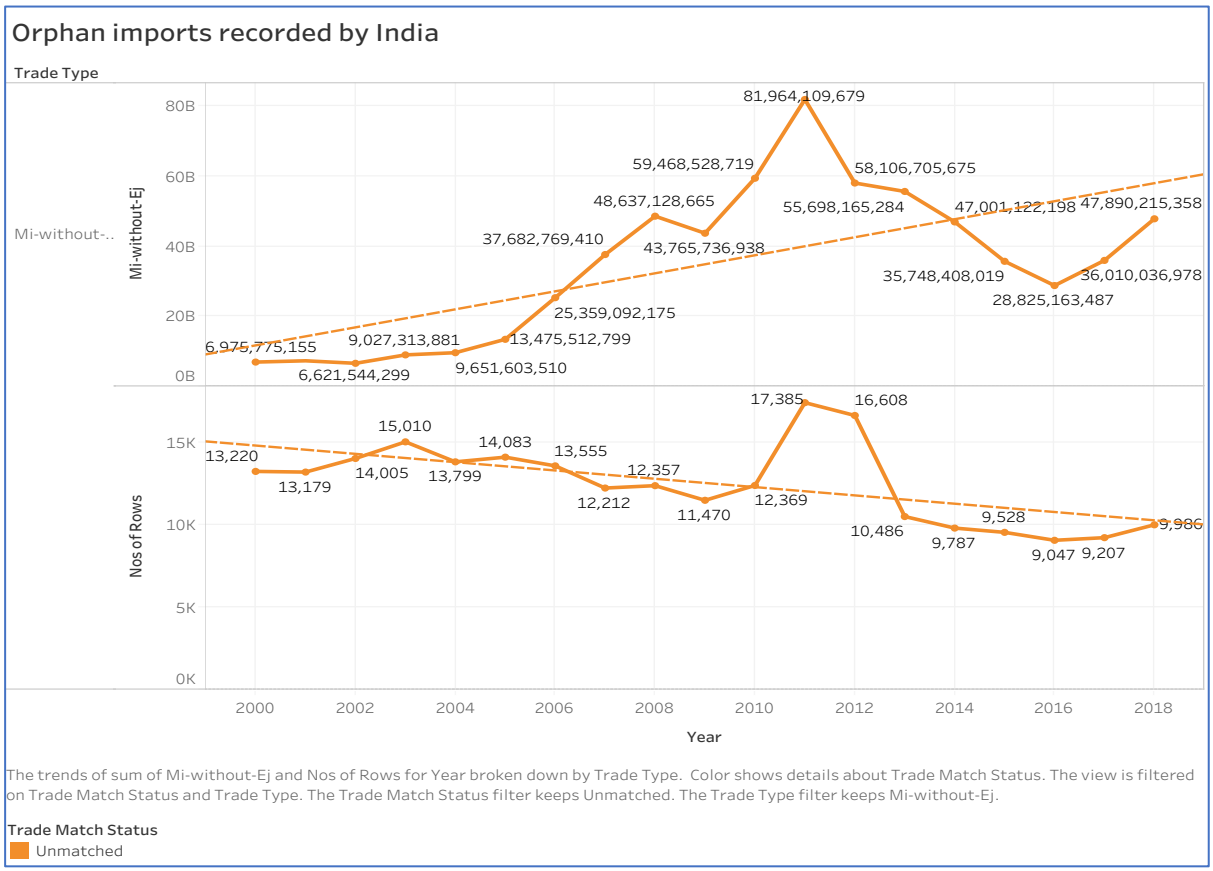


Chart 5: Orphan imports recorded by India
(Source: Author's calculations from UN Comtrade data)

Saudi Arabia accounted for most of the Mi-without-Ej, followed by Australia, Switzerland, S. Africa and China. However, in terms of the number of rows in which these orphan imports appeared, it was HK China (not Saudi Arabia), that held the top position followed by Japan, France, Malaysia and USA.

Only a small percentage of commodities accounted for bulk of the orphan imports recorded by India

Our database contained 237, 293 rows that displayed orphan imports on the Indian side (Mi without Ej). These involved 5017 commodities with the combined amount of $659.25 billion. **Table 6** contains the statistics for this data.

Table 6:
Statistics about orphan imports recorded by India (Mi-without-Ej)

Count:	5017	**Commodities**	**% of amount**
SUM(Mi-without-Ej)	$659,248,243,882	Top 5 (0.1%)	75.01%
Average:	$131,402,878.99	Top 25 (0.5%)	87.53%
Minimum:	$69	Top 50 (1%)	90.60%
Maximum:	$243,648,992,984	Top 100 (2%)	93.02%
Median:	$2,014,855.00		
Standard deviation:	$4,210,211,930		

(Source: Author's calculations from UN Comtrade data)

The amount of orphan imports ranged from $69 to $243.65 billion with a standard deviation of $4.2 billion. Only 2 percent (top 100) commodities accounted for over 93 percent of the value of the orphan imports recorded by India.

Lost exports recorded by partner countries (Ej-without-Mi) shows an uptrend

The time series shows a slight uptrend in the values of lost exports (Ej-without-Mi) and a downtrend in the number of rows in which these values appear (**Chart 6**).

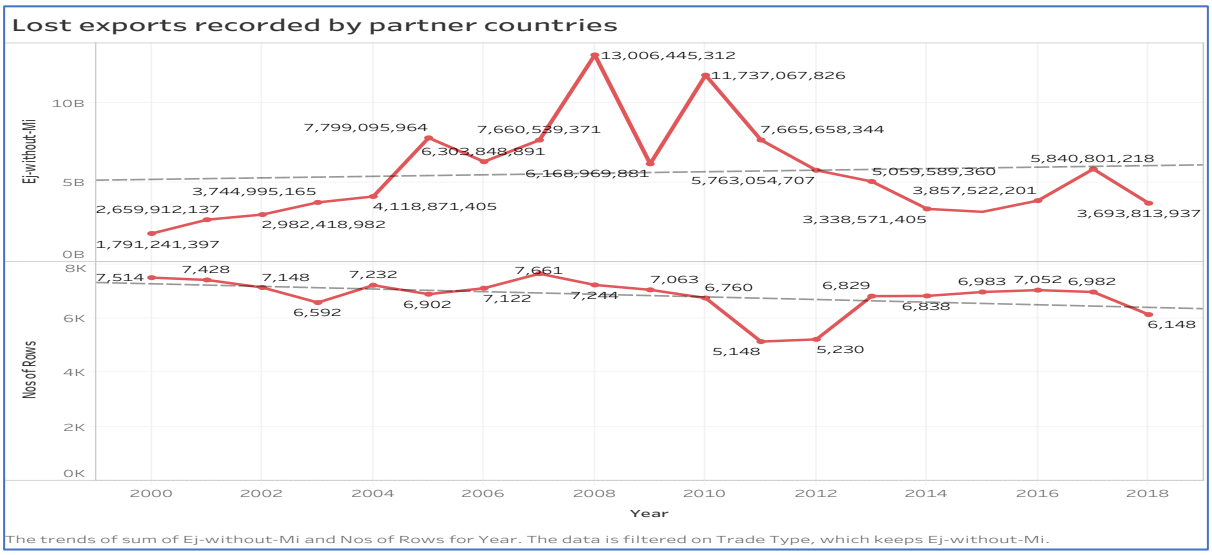


Chart 6: Lost exports recorded by partner countries
(Source: Author's calculations from UN Comtrade data)

Australia accounts for the maximum amount ($22.61 b), followed by South Africa, Indonesia, Germany and USA. However, in terms of the number of rows in which lost exports appear, Singapore tops the list followed by Thailand and S. Africa.

Only a small percentage of commodities account for bulk of lost exports recorded by partner countries

In our database there were 129,876 records containing lost exports (Ej-without-Mi) of $106.34 billion (**Table 1**). The statistical summary of the data is in **Table 7**.

Table 7:
Statistics about lost exports (Ej-without-Mi) recorded by partner countries

Count:	5016	**Commodities**	**% of amount**
SUM(Ej-without-Mi)	$106,345,818,087	Top 5 (0.01%)	56.70%
Average:	$21,201,319.40	Top 25 (0.50%)	72.04%
Minimum:	$1	Top 50 (0.98%)	77.26%
Maximum:	$34,410,709,613	Top 100 (1.97%)	81.70%
Median:	$926,709.50		
Standard deviation:	$538,049,735		

(Source: Author's calculations from UN Comtrade data)

A small percentage of commodities accounts for a majority of lost exports on the partner country side. Less than 2 percent (top 100) commodities account for nearly 82 percent of the lost exports (Ej without Mi). The top 5 commodities account for nearly 57 percent of the lost exports.

INTERPRETING THE EFFECTS OF ORPHAN IMPORTS AND LOST EXPORTS

The Partner Country Method (PCM) for computing Trade Mis-invoicing requires comparing the trade values for the same transactions reported by the two (reporting and partner) countries and analysing the trade gap, if any, in the reported values. The studies using the PCM have to exclude the Unmatched records in the Comtrade database that have trade values reported on only one side (the so-called lost exports and orphan imports), as a comparison with the corresponding amount on the other side is not possible. Our analysis of India's trade data for 19 trading partners during the period 2000-2018 involving over 5,000 commodities indicates that:

1. Most of the traded commodities display both Matched (trade values reported by both sides) and Unmatched (trade values reported by only one side) transactions.
2. In the Matched category, most of the commodities show differences in the amounts reported by the two sides, even after applying the deflator of 1.1 to the CIF import values. These differences, depending on the sign (plus or minus), indicate either over-or under-invoicing in most of the imported and exported commodities. However, only a very small percentage (less than 5) of commodities account for bulk (over 50 percent) of the mis-invoicing.
3. Similarly, in the Unmatched category also, while most of the commodities display one-sided, un-matched transactions (Lost Exports and Orphan Imports), only a small percentage accounts for the bulk of amounts involved in such transactions, as discussed in the foregoing paragraphs. The number of the records that display such orphan imports and lost exports and the amounts involved are sizeable and, therefore, any conclusion on trade misinvoicing or IFF, drawn from the application of Partner Country Method, would be incomplete if the lost exports and orphan imports are excluded from consideration.

The question is how to interpret these transactions? **Table 8** summarises the number of commodities and the amounts involved in each category.

Table 8

		No. of commodities	**Amount $billion**
1	Commodities displaying Import Over-invoicing	1656	244.77
2	Commodities displaying Import Under-invoicing	3352	686.54
3	Commodities displaying Export Over-invoicing	2313	277.33
4	Commodities displaying Export Under-invoicing	2695	307.31
5	Commodities displaying lost export (Ei without Mj)	5053	78.69
6	Commodities displaying orphan import (Mj without Ei)	4995	42.49
7	Commodities displaying orphan import (Mi without Ej)	5017	659.25
8	Commodities displaying lost export (Ej without Mi)	5039	106.35

(Source: Author's calculations from UN Comtrade data)

In summary, of the 5008 commodities for which the import and export transactions were analysed, 33 percent displayed import over-invoicing while 67 percent displayed import under-invoicing. Similarly, 46 percent displayed export over-invoicing while 54 percent displayed export under-invoicing. **Table 8** also shows that the amounts of lost and orphan trade are significant, when compared with the amounts of computed over- or under-invoicing.
Hypothetically, the lost exports or orphan imports could be because of:

1. Misclassification: on either the reporter (India) side or on the partner country side. This means that the trade that should have been classified under the same HS code on both sides may have been classified under different HS code. This is quite possible as two different countries are involved in classification of the same commodity. However, the likelihood of such misclassification occurring consistently year after year will be unlikely and its persistence should merit investigation.

2. Falsification of exports or imports through mis-invoicing: is another possibility. Governments, especially in developing countries or countries that follow export-led growth model, provide incentives for exports. There could be a strong motivation to claim those incentives by falsifying the export records. However, since exports must be accompanied by a corresponding inflow of funds, strong controls to verify the exports and the related funds inflow as a pre-requisite for allowing the incentives may act as a deterrent. Since export related inflow of funds will be received through the banking channels, a monitoring system that is able to link the reported exports with the corresponding funds inflow will be an effective check. There are however two problems. Firstly, there is often a time gap between the recording of the exports and the receipt of the export proceeds. Secondly, it is possible to falsify the export records in order to claim export incentives if an alternative source of funding the export proceeds is found. Illicit outflows of funds through import over-invoicing or export under-invoicing could provide such alternative means. In such a scenario lost exports or orphan imports would assume a different meaning.

3. The above gives rise to the possibility of such transactions being a part of circular flow of illicit funds. For example, funds sent abroad through import over-invoicing or export under-

invoicing can be brought back through import under-invoicing, export over-invoicing or by falsifying the exports. This will result in transactions falling under the category of Lost and Orphan trade. Such transactions will not only facilitate circular inflow and outflow of illicit funds through trade mis-invoicing but also provide the additional benefit of export incentives. Such a possibility, for example, will make the analysis of Lost Exports recorded by India (Ei-without-Mj transactions) very interesting. If the system of checks is not robust, this can prove to be an attractive model for illicit flow of funds.

Although it may appear that mis-invoicing exports could be easier than mis-invoicing imports that involve payment of import duty and valuation by the customs authorities, our analysis (see **Table 8** above) shows that import mis-invoicing is more predominant than export mis-invoicing. Especially, the import under-invoicing appears to be the most predominant category in view of the strong incentive to save on import duties. Proving any of the above hypotheses will be investigative in nature and require transaction level information, which is outside the scope of this study, being based on the aggregated commodity data at the country level reported to UN Comtrade. However, an analysis of even the aggregated Comtrade data can provide an useful basis for further investigation.

We can re-organise the eight categories of commodities listed in **Table 8** into two broad groups: (a) commodities that fall under any of the categories 1 to 4 and (b) commodities that fall under any of the categories 1 to 4 and also under one or more of categories 5 to 8. While commodities in group (a) will not be impacted by the phenomenon of lost exports or orphan imports, the commodities under group (b) will be.

Let us discuss this with some specific examples. From our analysis of the 6-digit commodity code (HS6) level data we identified five such commodities which are listed in **Table 9** along with the quantities involved. We discuss each of these below.

Table 9: Commodities impacted by the orphan imports and lost exports

USD billion									
	HS Code	**Import Over-invoice**	**Import Under-invoice**	**Export Over-invoice**	**Export Under–invoice**	**Ei-without-Mj**	**Mj-without-Ei**	**Mi-without-Ej**	**Ej-without-Mi**
1	**100620**				**-2.79**		**1.55**		
2	**260111**				**-31.00**	**0.67**			
3	**270112**		**-75.33**						**34.41**
4	**270119**	**40.60**						**80.01**	
5	**270799**		**-3.78**			**0.82**			

(Source: Author's calculations from UN Comtrade data)

1. HS 100620: shows export under-invoice of $2.79 b and orphan import (Mj-without-Ei) of $1.55 b reported by the partner countries of India. In other words, while the export of this commodity to partner countries was under-reported by India to the extent of $2.79 billion, the partner countries reported import of this commodity from India to the extent of $1.55 billion which was not reported by India as export to these countries. Assuming that this was a case of mis-classification, the value of $1.55 b. not recorded in India could be reduced from the export under-invoice of $2.79 billion. However, it could also mean fake imports at the end of the partner country, for facilitating illicit outflows of funds. The real position will be revealed only by investigation.

2. HS 260111: shows export under-invoicing of $31 b and lost exports (Ei- without- Mj) of 0.67 billion reported by India. If it is a case of misclassification, then correct classification could reduce the amount of export under-invoicing to that extent. However, it could possibly also mean fake exports, as there are no corresponding imports recorded on the other side, with the intention of claiming export incentives from the Government. Again, the real position will be revealed from investigation.

3. HS 270112: shows an import under-invoice of $75.33 b and lost exports (Ej-without- Mi) of $34.41 billion reported by the partner countries. If $34.41billion of lost exports is a case of mis-classification at the end of the partner countries, then it could go to reduce the import under-invoice of $75.33 billion on the Indian side. Alternatively, Ej could as well be fake export recorded on the partner country side to receive illicit funds from outside or to claim export subsidy from the Government.

4. HS 270119: shows import over-invoice of $40.60 billion on the Indian side and orphan import (Mi-without- Ej) of 80.01 billion reported by India without any corresponding export reported by the partner countries. If the amount of $80.01 b. is taken as misclassification then the actual amount of import over-invoice would go up to that extent as $80.01 will be added to the import over-invoice figure of $40.60 billion. The other possibility could be the misclassification at the end of the partner country.

5. HS 270799: shows import under-invoice of $3.78 billion on the Indian side and lost exports (Ei-without-Mj) of $0.82 billion reported by India. The latter figure could be fake exports recorded on the Indian side to claim export incentives or import mis-classification on the partner countries' side, in which case it will be added to the import under-invoice of $3.78 billion for India.

Each of the above cases will require at the detailed (HS6) commodity level with full information on the partner countries and actual transacting party level information, which is not reported to the UN Comtrade. However, the analysis of the aggregated data, as discussed in the specific examples above, provides strong clues for the direction of investigation for determining the illicit flows.

SUMMARY AND CONCLUSIONS

Orphan imports and lost exports refer to import and export transactions that have been reported by only one of the two trading partners. The number of transactions and amounts

involved in orphan and lost trade observed in India's trade with 19 of its major trading partners over 2000-2018, are significant and amount to billions of dollars. Although the percentage of rows showing orphan and lost trade shows gradual decrease over 2000-2018, indicating perhaps a qualitative improvement in the data reported to Comtrade, the amounts involved show an uptrend. The phenomenon appears to be more pronounced in the imports reported by India. The orphan imports recorded by India are actually more than 15 times the orphan imports recorded by partner countries, although the amount of lost exports recorded by India was less than those recorded by the partner countries. Further, although the incidence of lost exports and orphan imports was seen in most of the over 5,000 commodities analysed, only a small percentage of commodities accounted for the majority of the amounts involved. These amounts are substantial, as compared to the computed amounts of import and export mis-invoicing and, therefore, their impact on the illicit financial flows implied by the mis-invoicing requires to be studied. The examples discussed in this paper amply underline that the estimates of illicit financial flows by computing trade gaps in the matched partner trade statistics will be incomplete without considering the impact of orphan imports and lost exports. The paper underlines that to in order to do so, the analysis will have to be at the most detailed level of commodity data, unlike many studies that rely on the aggregated, country level export and import data.

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References

Beja, E. (2006). Was capital fleeing Southeast Asia? Estimates from Indonesia, Malaysia, the Philippines, and Thailand. *Asia Pacific Business Review*, 12 (3), 261-283.
https://www.tandfonline.com/doi/abs/10.1080/13602380600578133 Accessed 15 July 2021

Biswas, Amit K and Marjit, Sugata (2007): Preferential trade and mis-invoicing: Some analytical implications, *International Review of Economics & Finance*, Elsevier, Vol. 16 (1), pages 130-138.

Buehn, A. and Eichler, S. (2011). Trade Misinvoicing: The Dark Side of World Trade. *World Economy*, 34 (8), 1263-1287.

https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-9701.2011.01375.x (accessed 2 June 2020)

Carrere, Celene and Christopher Grigoriou. 2014. Can Mirror Data Help to Capture Informal International Trade? Policy Issues in International Trade And Commodities Research Study Series No. 65. UNCTAD.

https://unctad.org/en/PublicationsLibrary/itcdtab65_en.pdf (accessed 2 June 2020)

Cheung, Y.-W., Steinkamp, S., & Westermann, F. (2020). Capital flight to Germany: Two alternative measures. *Journal of International Money and Finance*, 102, 102095. doi:10.1016/j.jimonfin.2019.102095

Fisman R., and S. Wei. (2004). "Tax Rates and Tax Evasion: Evidence from 'Missing Imports' in China," *Journal of Political Economy*, 112 (2), pp. 471-496.

Forstater, Maya. 2018. "Illicit Financial Flows, Trade Misinvoicing, and Multinational Tax Avoidance: The Same or Different?" CGD Policy Paper. Washington, DC: Center for Global Development.
https://www.cgdev.org/publication/illicit-financial-flows-trade-misinvoicing-and-multinational-tax-avoidance (accessed 4 June 2020)

Gara, Mario, Giammatteo, Michele & Tosti, Enrico. (2018). Magic mirror in my hand…How trade mirror statistics can help us detect illegal financial flows.

https://www.researchgate.net/publication/325847232_Magic_mirror_in_my_handHow_trade_mirror_statistics_can_help_us_detect_illegal_financial_flows/citation/download accessed 24 May 2020

Global Financial Integrity. 2010. *Illicit Financial Flows from Africa: Hidden Resource for Development*. Washington, DC: Global Financial Integrity.

Global Financial Integrity. 2010. $854 Billion Removed from Africa by Illicit Financial Flows from 1970 to 2008 http://www.gfintegrity.org/pressrelease/854-billion-removed-africa-illicit-financialflows-1970-2008/ [accessed March 15, 2015].

Global Financial Integrity. 2013. Illicit financial flows from developing countries: 2002-2011 http://iff.gfintegrity.org/iff2013/Illicit_Financial_Flows_from_Developing_Countries_2002-2011-HighRes.pdf [accessed March 15, 2015].

Global Financial Integrity. 2014. Illicit financial flows from developing countries 2003-2012, Illicit Financial Outflows from the Top 10 Developing Economies, 2003-2012, available at: http://www.gfintegrity.org/wp-content/uploads/2014/12/Illicit

Global Financial Integrity (2015): "A Brief Biography of Illicit Financial Flows" https://www.gfintegrity.org/wp-content/uploads/2015/09/Ford-Book-Final.pdf

Global Financial Integrity. December 8 2015. Illicit Financial Flows from Developing Countries 2004-2013. https://gfintegrity.org/report/illicit-financial-flows-from-developing-countries-2004-2013/

GFI. January 2019. Illicit Financial Flows to and from 148 Developing Countries: 2006-2015 https://gfintegrity.org/report/2019-iff-update (Accessed 3 April 2020)

Global Financial Integrity, June 2019. India: Potential Revenue Losses Associated with Trade Misinvoicing:

(https://gfintegrity.org/wp-content/uploads/2019/06/GFI-India-2019.pdf). Accessed on 4 April 2020.

Jha, R. and Truong, D. N. (2014). Trade Misinvoicing and Macroeconomic Outcomes in India. The Australian National University, Australia South Asia Research Centre, ASARC Working Papers.

Kar, D. (2010). The Drivers and Dynamics of Illicit Financial Flows from India: 1948-2008. Washington DC: Global Financial Integrity.

McDonald**,** D. C. (1985). Trade Data Discrepancies and the Incentive to Smuggle: An Empirical Analysis. International Monetary Fund Staff Papers, 32 (4), 668-692.

Ndikumana, Leonce. 2016. Trade Misinvoicing in Primary Commodities in Developing Countries: The cases of Chile, Cote d'Ivoire, Nigeria, South Africa and Zambia. Geneva: UNCTAD.

Nitsch V. (2016). "Trillion-dollar estimate: Illicit financial flows from developing countries," Darmstadt Discussion Papers in Economics, 227, 15 p.

Slim, Sadri & Carton, Christine. (2018). Trade misinvoicing in OECD countries: what can we learn from bilateral trade intensity indices?

(https://www.researchgate.net/publication/326132374_Trade_misinvoicing_in_OECD_countries_what_can_we_learn_from_bilateral_trade_intensity_indices/citation/download, accessed 24 May 2020)

UNECA (2015). Illicit Financial Flows, Report of the High-Level Panel on illicit financial flows from Africa 27 p. https://repository.uneca.org/ds2/stream/?#/documents/0ca955c2-2e56-5120-a605-9e8a7566c7d3/page/29 accessed 7 September 2021.

UN Comtrade (2014) Commodity Trade Statistics Database, available at http://comtrade.un.org/

UNCTAD (2016a) Trade misinvoicing in primary commodities in developing countries: the cases of Chile, Côte d'Ivoire, Nigeria, South Africa and Zambia, UNCTAD/SUC/2016/2, 1st version, accessed 16 Dec 2016