Measurement of Tax and Commercial Illicit Flows

Method 1: Partner Country Method (PCM)

1 December 2021

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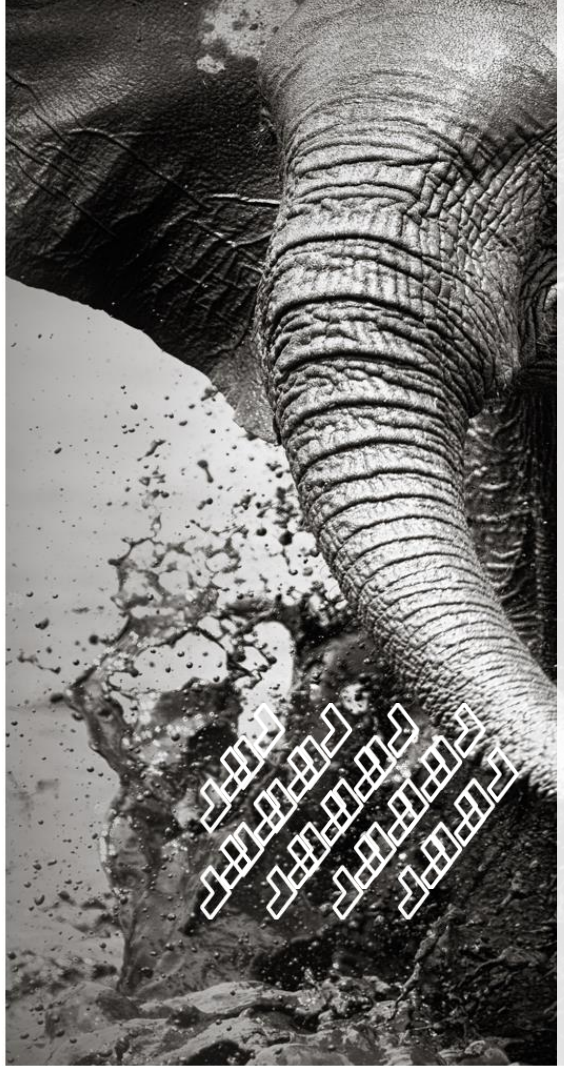


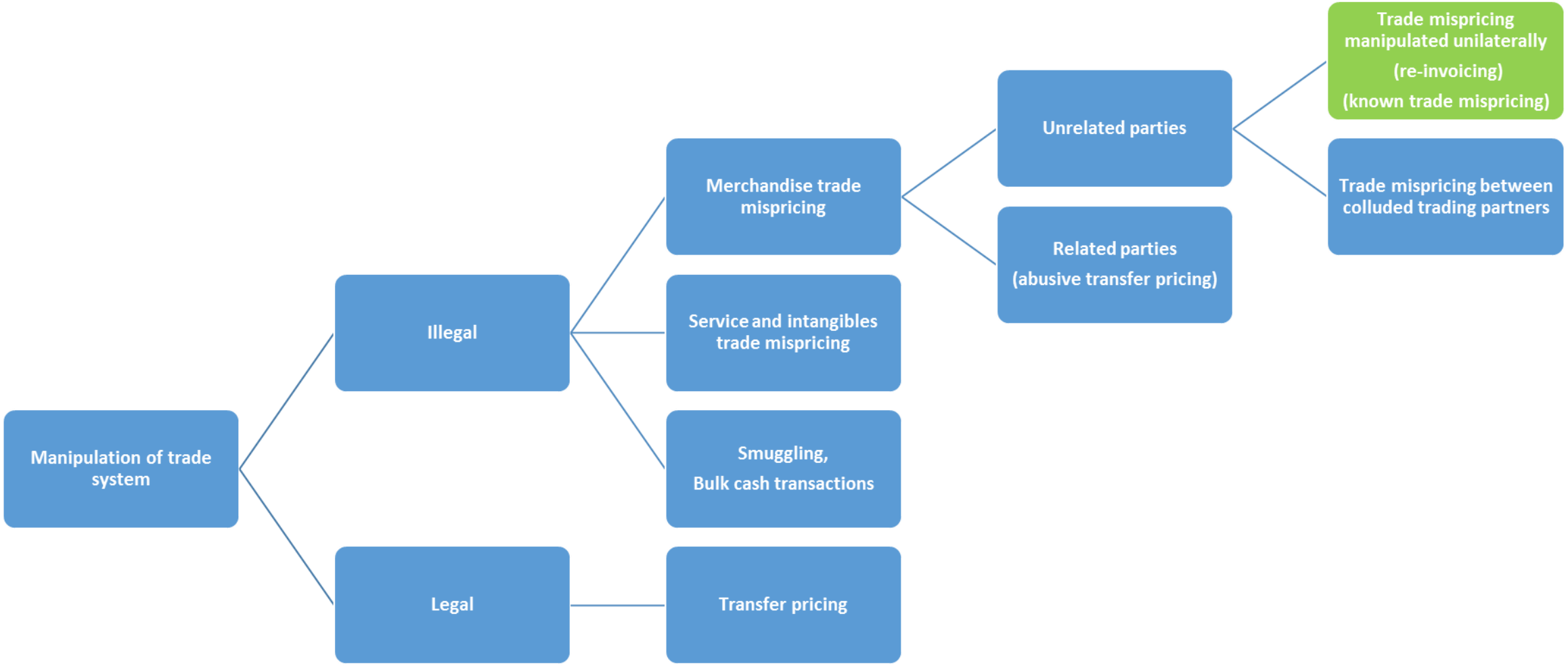
01

Overview of the South African Case

Example of the PCM model, and its developments since 2013

Measuring Trade Anomalies

Illustration of Limitations



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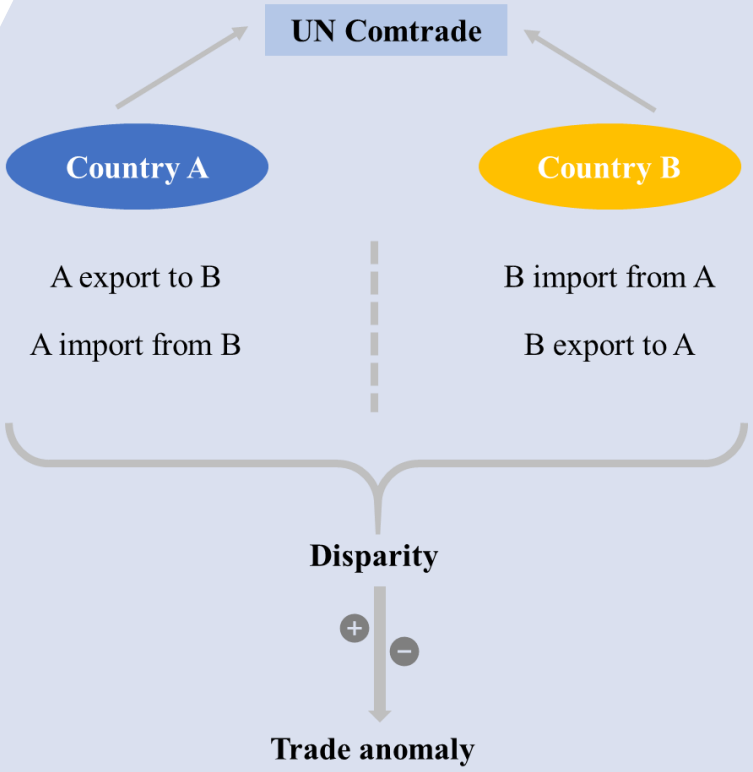
Measuring Trade Anomalies

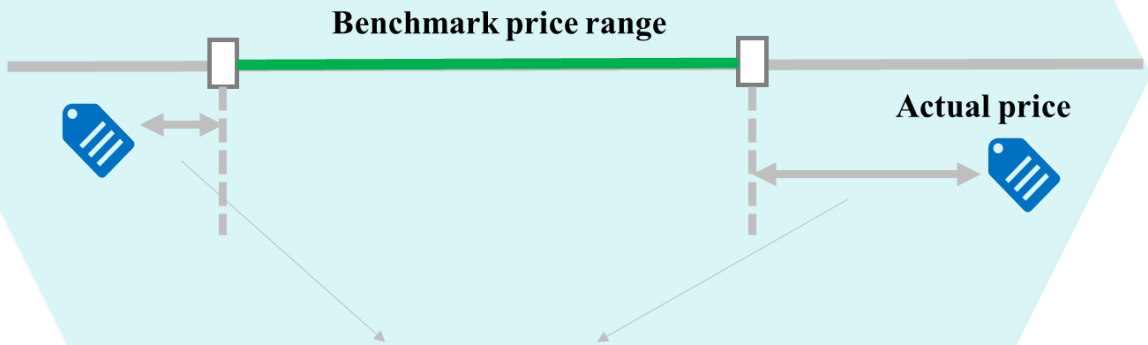
Methods

Partner Country Method



- mirror data analysis
- likely to under-estimate IFFs

Price Filter Method



Price anomaly

- unit price analysis
- likely to over-estimate IFFs

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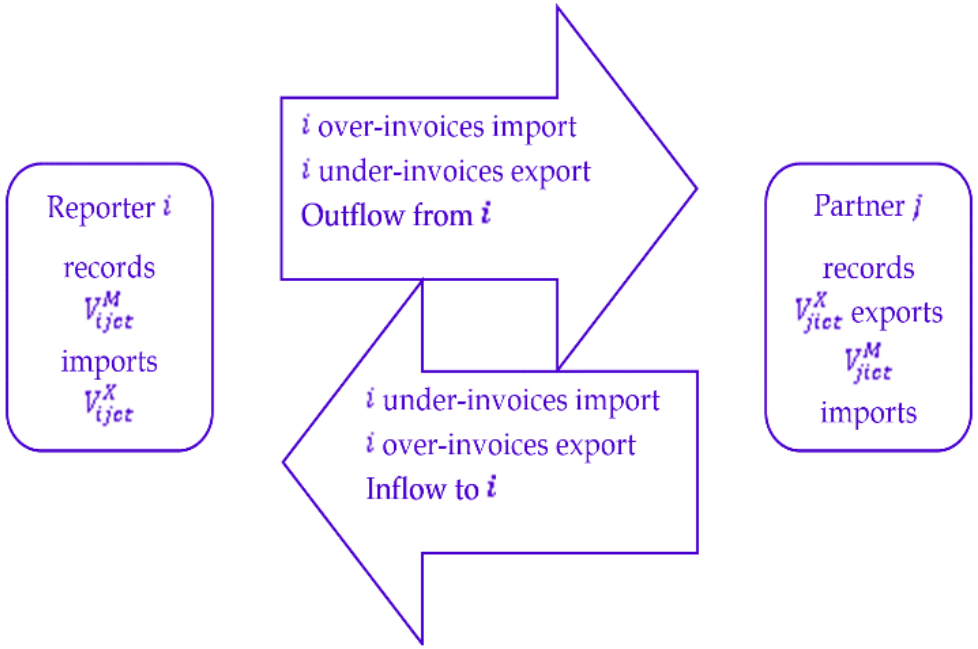
Partner Country Method

Methods

discrepancies in official trade records between trade partners
adjust for trade system (general v.s. special)
adjust for indirect trade
adjust for partner countries attribution (consignments for imports, re-exports and merchanting)
adjust for valuation (f.o.b v.s c.i.f)
adjust for commodity codes and descriptions (e.g., country-specific HS codes)
adjust for special classifications (e.g., HS 98 and HS 99)
adjust for frequency of data adjustments or revisions
adjusted trade discrepancies
consider for the timing difference
consider for confidentiality
consider for mark-ups via third country
consider for change of ownership
consider for information coverage
consider for legal informal trade
consider for variations in declaration of product classification at the customs border
consider for variations in data compilation and estimation methods
consider for exchange rate
consider for reporting error
trade misinvoicing



Partner Country Method

Case study

Bilateral inbound trade of mobile phones

Inbound Trade	CAN imports	CHN exports
Official data	3 329	1 362
Published asymmetry		1 967
Adjustment: *CAN imports of CHN goods from countries of export (consignment) other than CHN	1 280	
Adjusted official data	2 049	1 362
Remaining asymmetry		687

Source: Bojan Nastav presentation Part II – Methods Partner Country Method

Partner Country Method

Scenario

Scenario	Possible Sign	Interpretation	Mis-invoicing Plausibility
Country *i* Exports to Country *j* **OR** **Country *j* Imports from Country *i***	> *	Country ***i*** under-invoicing / under-reporting Exports	Tax evasion and capital flight, exchange controls, smuggling/mis-declaration, import quotas in Country ***j***.
		Country *j* over-invoicing Imports from Country ***i***	TNCs and MNCs: Tax evasion, capital flight into Country ***i***, exchange controls.
	<	Country ***i*** over-invoicing Exports	Export incentives
		Country ***j*** under-invoicing Imports from Country ***i***	TNCs and MNCs: Import quotas in Country ***j***, grey stock and smuggling.
Country *i* Imports from Country *j* **OR** **Country *j* Exports to Country *i***	<	Country ***i*** under-invoicing / reporting of Imports	TNCs and MNCs: Import quotas, grey stock, smuggling and mis-declaration.
		Country ***j*** over-invoicing Exports to Country ***i***	Export incentives, capital flight from Country ***i***, exchange controls.
	> *	Country ***i*** over-invoicing Imports	TNCs and MNCs: Tax evasion, capital flight from Country ***i***, mis-declaration.
		Country ***j*** under-invoicing its Exports to Country ***i***	Tax evasion and capital flight to Country ***i*** , exchange controls, smuggling/mis-declaration, import quotas in Country ***i***

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Partner Country Method

Practical guidance

Limitations	Overcoming limitations

• Endogeneity of statistical price filters
• Heterogeneity of products
• Inability to identify legitimate unusual prices
  ○ Long-term contracts
  ○ Volatile prices
• Inability to detect with small differences
• Not capturing mis-recording of quantities
	• Set price filter at a detailed level
	  ○ Lowest level of classification
	  ○ Description of the commodity
	• Use free-market prices for the filter
	  ○ Avoid endogeneity
	  ○ Alt: moving averages of observed prices
	• Consult experts

Source data

- International trade flows (flows, price, quantity, value, products, trading partners)
- Customs or other national authorities
- Transaction-level data
  - Use microdata before adjustments
- International sources:
  - UNCTAD commodity prices
  - World Bank commodity market prices
  - UN Comtrade Standard Unit Value

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Source: Bojan Nastav presentation Part II – Methods Partner Country Method

Partner Country Method: The South African Case Study

Related studies

Study	Evidence from South Africa	Data and methodology
AU/ECA Report (2015)	• South Africa lost **USD 81,8 billion** in trade-based IFFs (trade mis-invoicing) between **1970-2008**	• UN Comtrade • Use mirror pair trade data to estimate anomalies in import and export data reported between the trading partners
Ndikumana, Naidoo, and Aboobaker (2020)	• South Africa lost over **USD 300 billion through capital flight from 1970 to 2017**, including through over-invoicing of imports and under-invoicing of exports. • Net trade mis-invoicing amounted to **USD 146 billion over the 1998-2017** period alone. • Export under-invoicing appears to be especially rampant in the case of mineral resources such as gold, silver, platinum and diamond.	• World Bank's International Debt Statistics (IDS) Database and IMF Direction of Trade Statistics (DOTS) database • Balance of Payments (BoP) residual method: capital flight is measured as discrepancies between recorded inflows and outflows of foreign exchange as reported in the Country's official Balance of Payments • Measure trade misinvoicing at the bilateral and product level using anomalies in trade mirror statistics
Global Financial Integrity (2019)	• Using DOTS-based estimates of IFFs, South Africa experienced **USD 10,2 billion** of illicit outflows in 2015 • Using Comtrade-based estimates of IFFs, South Africa experienced **USD 5,9 billion** of **illicit outflows in 2015**	• IMF Direction of Trade Statistics (DOTS) database and UN Comtrade. • Use mirror pair trade data to estimate anomalies in import and export data reported between the trading partners.

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Partner Country Method: The South African Case Study

Related studies

Study	Evidence from South Africa	Data and methodology
Global Financial Integrity (2020)	• The total value gaps (trade mis-invoicing) identified in trade between South Africa and all of their global trading partners have an average of **USD 19,988 million** from 2008-2017 (or 19.4 percent of total trade) • The total value gaps (trade mis-invoicing) identified in trade between South Africa and 36 advanced economies have an average of USD 9,841 million from 2008-2017 (or 19.1 percent of total trade)	• UN Comtrade. • Value gap analysis: identify any gaps found in the reporting data when the reported values by both partners do not match.
Nicolaou and Wu (2016)	• South Africa's gross trade mispricing amounts to **USD 42,7 million** in 2015, while the net effects amounting to **USD 41,2 million**	• UN Comtrade. • Use mirror pair trade data to estimate anomalies in import and export data reported between the trading partners. • Apply an actual measure of the CIF parameter by country and product category. • Apply the Walker Money Laundering Attractiveness Index to determine the direction of flow between countries. The index is a gauge of where the proceeds of crime, which includes tax evasion, are likely to be laundered. • Includes data noise from non-reported gold, diamonds

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Partner Country Method: The South African Case Study

Related studies

Study	Evidence from South Africa	Data and methodology
Cobham and Jansky (2018)	• **USD 5,83 billion to USD 6,73 billion** revenue loss from corporate tax avoidance for South Africa in 2013.	• World Institute for Development Economics Research Government Revenue Database. • Re-estimate IMF model: a distinction between spillover effects through real investment decisions and through avoidance techniques and quantify the revenue impact of the latter.
Janský & Palanský (2019)	• Using global model, South Africa has tax revenue loss of **USD 948,4 million** in 2016 • Using developed and developing countries model, South Africa has tax revenue loss of **USD 1,197 million in 2016** • In the extended model, South Africa experience **USD 204 million** shifted profits tax revenue loss and **USD 57,1 million in 2016**	• IMF's Coordinated Direct Investment Survey (CDIS) and IMF's Balance of Payments Statistics (BOP). • FDI approach to estimate profit shifting: estimate the relationship between the rate of return on FDI and the share of FDI from tax havens and derive an estimate of the scale of profit shifting by multiply the responsiveness of the reported rate of return to the share of FDI from tax havens by the actual value of FDI from tax havens, adjust to pre-tax values, and multiply by the relevant statutory tax rate to generate tax loss estimate. • The extended model allows for effects that are heterogeneous across regions and income groups to influence the relationship between the share of FDI from tax havens and the rate of return on FDI.

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Partner Country Method: The South African Case Study

1 Data downloading

Approach

A's imports from B

A's export to B

B's exports to A

B's imports from A

2 Adjust for exchange rate

3 Conversion Factor adjustment: FOB vs CIF

4 Conversion Factor adjustment: time lags

5 Calculate difference

5 Calculate difference

6 Adjust directions

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Partner Country Method: The South African Case Study

Illustration of Trade Mispricing

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Partner Country Method: The South African Case Study

The results from the research -FIC model

Description	2011 millions	2012 millions	2013 millions
Net Export Mispricing	R -314,071	R -438,472	R -473,401
Net Import Mispricing	R -55,793	R -86,106	R -43,244
Total NET Trade Mispricing	R -369,864	R -524,578	R -516,645
Exchange Rate (Rands/USD)	R 7.25	R 8.21	R 9.65
Trade Mispricing in Dollars	($50,994)	($63,896)	($53,537)
Net effect on South Africa (OUTFLOWS LESS INFLOWS)	R 258,278	R 352,366	R 430,157
EXPORT UNDER-INVOICING (Outflow)	R -350,861	R -477,852	R -511,420
IMPORT OVER-INVOICING (Outflow)	R 109,589	R 102,510	R 117,742
EXPORT OVER-INVOICING (Inflow)	R 36,790	R 39,380	R 38,019
IMPORT UNDER-INVOICING (Inflow)	R -165,382	R -188,616	R -160,986
OUTFLOW	R 460,451	R 580,362	R 629,162
INFLOW	R 202,172	R 227,996	R 199,005

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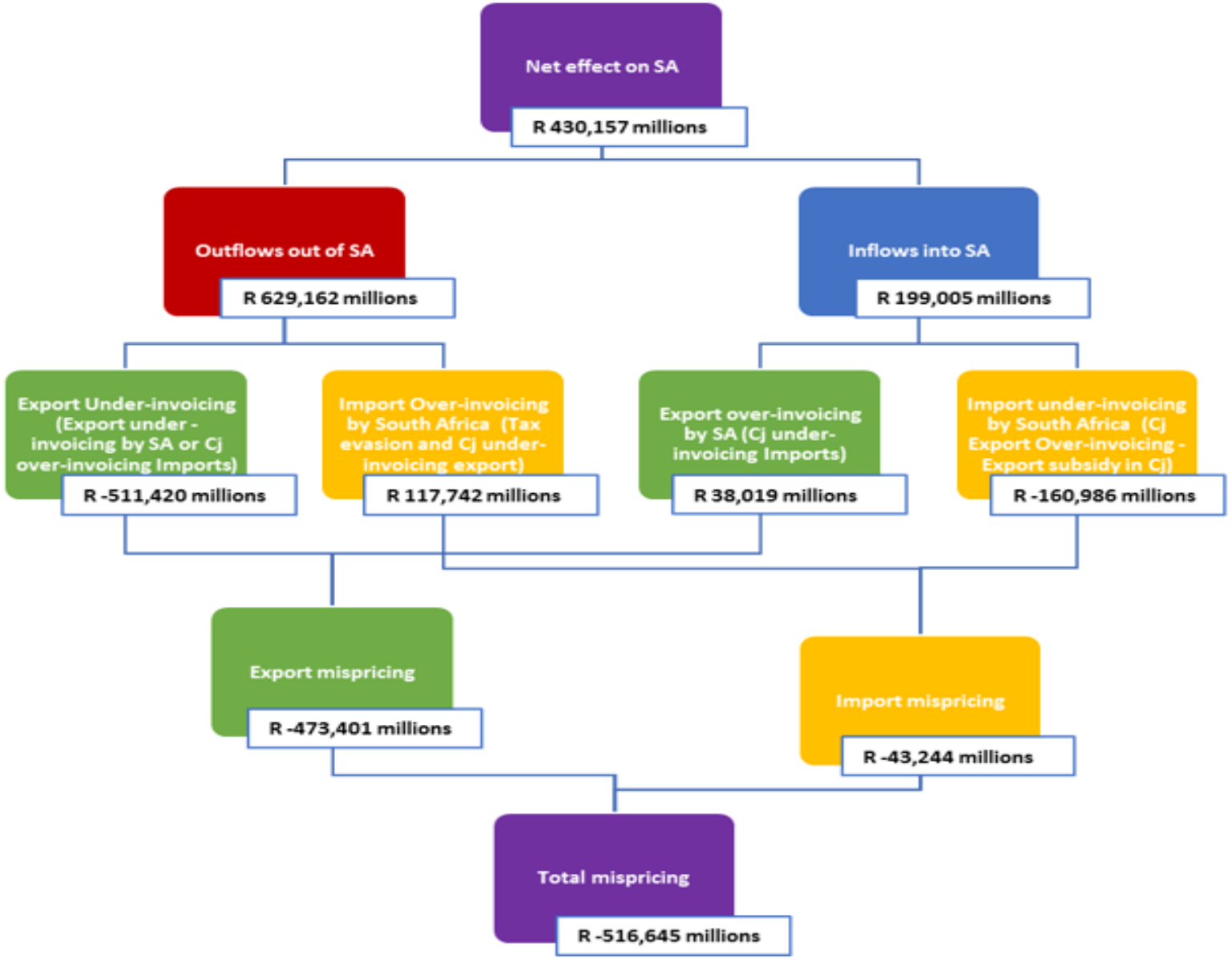
Partner Country Method: The South African Case Study

The results from the research – 2013 -FIC model



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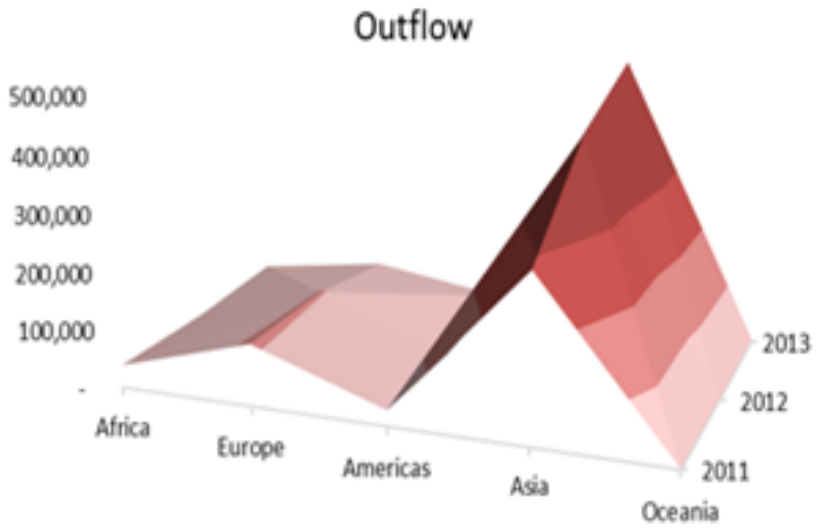
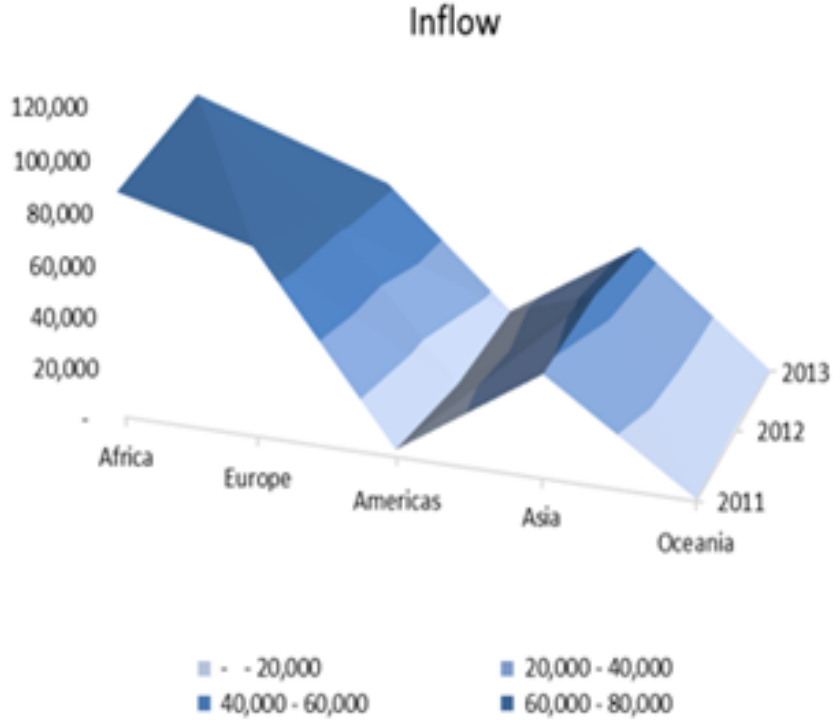
Partner Country Method: The South African Case Study

The results from the research – 2011-2013 -FIC model

	outflow			inflow			net effect (Postive=outflow)		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Africa	39,262	30,234	34,380	87,742	110,297	78,356	(48,479)	(80,063)	(43,976)
Europe	106,923	102,248	65,924	72,450	66,132	62,146	34,473	36,116	3,778
Americas	27,233	17,814	30,346	2,788	3,606	12,248	24,445	14,207	18,098
Asia	286,440	429,750	491,966	38,363	46,247	45,944	248,078	383,503	446,022
Oceania	592	316	6,546	830	1,713	312	(238)	(1,397)	6,234
TOTAL	460,451	580,362	629,162	202,172	227,996	199,005	258,278	352,366	430,157





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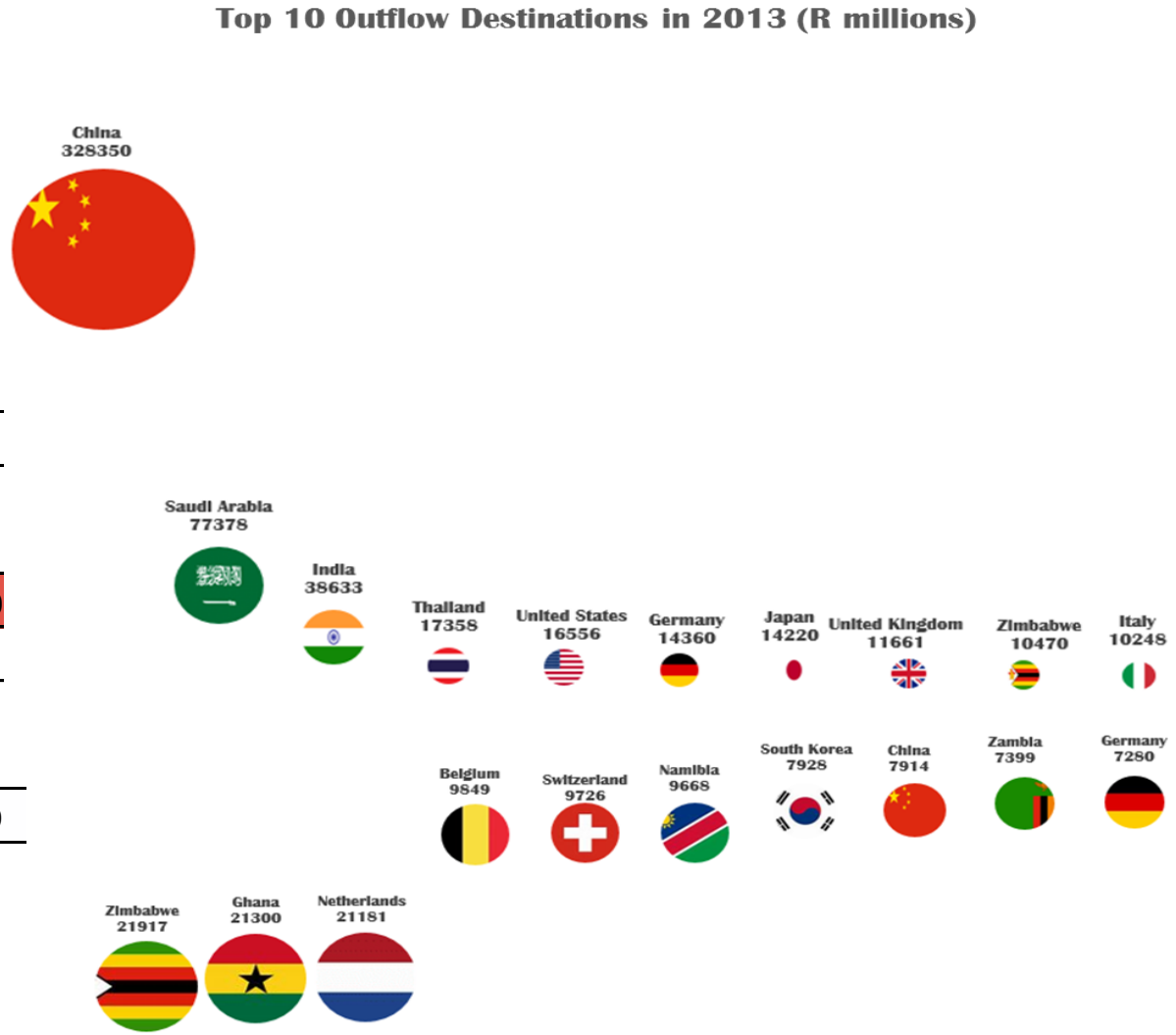
Partner Country Method: The South African Case Study

The results from the research –2011- 2013 -FIC model

OUTFLOW					
Import Over-invoicing			Export Under-invoicing		
2011	2012	2013	2011	2012	2013
109,589	102,510	117,742	350,861	477,852	511,420
INFLOW					
Import under-invoicing			Export over-invoicing		
2011	2012	2013	2011	2012	2013
165,382	188,616	160,986	36,790	39,380	38,019



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Partner Country Method: The South African Case Study

The results from the research –2011- 2013 -FIC model

	outflow			inflow			net effect (Postive=outflow)		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Live animals, animal products	1,134	1,365	1,375	2,437	2,393	2,582	(1,303)	(1,028)	(1,207)
Vegetable products	10,541	13,193	17,358	5,584	4,219	5,162	4,957	8,974	12,196
Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	1,292	1,464	879	453	1,399	779	839	64	100
Prepared foodstuffs, beverages, spirits, and vinegar; tobacco and manufactured tobacco substitutes	6,394	5,705	7,112	8,343	12,742	14,840	(1,949)	(7,036)	(7,727)
Mineral products	104,088	111,504	122,160	36,201	57,210	46,799	67,887	54,294	75,361
Products of the chemicals or allied industries	41,200	31,533	40,139	16,058	19,292	20,154	25,143	12,241	19,986
Plastics and articles thereof; rubber and articles thereof	4,640	5,008	3,753	5,195	7,201	5,652	(555)	(2,193)	(1,899)
Raw hides and skins, leather, fur skins and articles thereof; saddler and harness, travel articles, handbags and similar containers; articles of animal gut (other than silkworm-gut)	1,111	1,723	1,587	2,391	2,414	3,979	(1,281)	(691)	(2,391)
Wood and articles of wood, wood charcoal, cork and articles of cork, manufactures of straw, of esparto or of other plaiting material, basket ware and wickerwork	862	1,366	1,115	406	330	381	456	1,036	734
Textiles and textile articles.	3,178	3,406	3,066	14,754	17,389	16,867	(11,576)	(13,983)	(13,801)
Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof; prepared feathers and articles made therewith, artificial flowers, articles of human hair	462	735	516	1,518	4,674	4,395	(1,056)	(3,939)	(3,880)

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Partner Country Method: The South African Case Study

The results from the research –2011- 2013 -FIC model

	outflow			inflow			net effect (Postive=outflow)		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Articles of stone, plaster, cement, asbestos, mica or similar materials, ceramic products, glass and glassware	2,556	1,630	1,604	1,693	3,360	4,770	863	(1,730)	(3,166)
Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation jewelry, coins	161,449	181,157	141,598	111,401	117,915	89,692	50,048	63,242	51,906
Base metals and articles of base metal	21,223	22,643	23,639	19,718	19,614	22,816	1,505	3,029	822
Machinery and mechanical appliances, electrical equipment; parts thereof, sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	39,939	43,680	47,296	32,201	33,887	34,173	7,738	9,793	13,123
Vehicles, aircraft, vessels and associated transport equipment	18,684	14,602	21,183	45,291	50,509	67,838	(26,606)	(35,907)	(46,654)
Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus, clocks and watches, musical instruments; parts and accessories thereof	5,012	5,533	15,511	4,418	5,549	5,701	594	(16)	9,810
Miscellaneous manufactured articles	3,510	2,731	2,797	2,873	7,440	8,996	638	(4,709)	(6,199)
Works of art, collectors' pieces and antiques	351	331	419	118	369	534	233	(39)	(115)
Other unclassified goods	148,684	271,091	328,155	2,895	4,268	4,161	145,789	266,823	323,993

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Partner Country Method: The South African Case Study

The results from the research – 2011-2013 -FIC model

	2011 outflow	2011 inflow	
Other non-metal mineral products	180,218	129,337	Other non-metal mineral products
Other Sector	148,684	45,291	Transport equipment
Petroleum products, chemicals, rubber and plastic	133,716	41,211	Petroleum products, chemicals, rubber and plastic
Metals, metal products, machinery and equipment	45,385	37,614	Metals, metal products, machinery and equipment
Transport equipment	18,684	18,663	Textiles, clothing and leather goods
Electrical machinery and apparatus	15,776	14,304	Electrical machinery and apparatus
Agriculture, forestry and fishing	11,676	10,617	Wood, paper, publishing and printing
Food, beverages and tobacco	7,686	8,796	Food, beverages and tobacco
Radio, TV, instruments, watches and clocks	5,012	8,021	Agriculture, forestry and fishing
Textiles, clothing and leather goods	4,751	4,418	Radio, TV, instruments, watches and clocks
Wood, paper, publishing and printing	3,927	2,895	Other Sector
Other Manufacturing	2,131	1,918	Furniture
Furniture	1,379	955	Other Manufacturing

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Partner Country Method: The South African Case Study

The results from the research – 2011-2013 -FIC model

	2012 outflow	2012 inflow	
Other Sector	271,091	142,996	Other non-metal mineral products
Other non-metal mineral products	201,983	61,981	Petroleum products, chemicals, rubber and plastic
Petroleum products, chemicals, rubber and plastic	128,849	50,509	Transport equipment
Metals, metal products, machinery and equipment	48,667	36,673	Metals, metal products, machinery and equipment
Electrical machinery and apparatus	17,656	24,478	Textiles, clothing and leather goods
Transport equipment	14,602	16,828	Electrical machinery and apparatus
Agriculture, forestry and fishing	14,558	14,141	Food, beverages and tobacco
Food, beverages and tobacco	7,169	6,613	Agriculture, forestry and fishing
Textiles, clothing and leather goods	5,864	5,970	Furniture
Radio, TV, instruments, watches and clocks	5,533	5,549	Radio, TV, instruments, watches and clocks
Wood, paper, publishing and printing	4,669	4,268	Other Sector
Other Manufacturing	2,107	2,661	Wood, paper, publishing and printing
Furniture	624	1,469	Other Manufacturing

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Partner Country Method: The South African Case Study

The results from the research – 2011-2013 -FIC model

	2013 outflow	2013 inflow	
Other Sector	328,155	116,558	Other non-metal mineral products
Other non-metal mineral products	162,189	67,838	Transport equipment
Petroleum products, chemicals, rubber and plastic	147,065	50,508	Petroleum products, chemicals, rubber and plastic
Metals, metal products, machinery and equipment	49,494	43,597	Metals, metal products, machinery and equipment
Electrical machinery and apparatus	21,441	25,241	Textiles, clothing and leather goods
Transport equipment	21,183	15,619	Food, beverages and tobacco
Agriculture, forestry and fishing	18,733	13,392	Electrical machinery and apparatus
Radio, TV, instruments, watches and clocks	15,511	7,744	Agriculture, forestry and fishing
Food, beverages and tobacco	7,991	7,740	Furniture
Textiles, clothing and leather goods	5,169	5,701	Radio, TV, instruments, watches and clocks
Wood, paper, publishing and printing	4,718	4,161	Other Sector
Other Manufacturing	2,126	3,051	Wood, paper, publishing and printing
Furniture	671	1,256	Other Manufacturing

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Partner Country Method: The South African Case Study

Trade Mispricing (Commodities) for South Africa – Outflows 2012

Rank	Country
1	China
2	Saudi Arabia
3	United Kingdom
4	Hong Kong
5	India
6	Thailand
7	Germany
8	Italy
9	Turkey
10	Mozambique

Rank	Product Category: Imports	Sector
1	27 Mineral fuels, oils and distillation products	Petroleum
2	99 Commodities not specified elsewhere	Other
3	84 Machinery, nuclear reactors, boilers	Machinery and Equipment
4	85 Electrical, electronic equipment	Electrical Machinery
5	28 Inorganic chemicals, precious metal compounds, isotopes	Basic chemicals

Rank	Product Category: Exports	Sector
1	99 Commodities not specified elsewhere	Other
2	71 Pearls, Precious stones, metals and coins	Mining
3	26 Ores, slag and ash	Iron and Steel
4	27 Mineral fuels, oils and distillation products	Petroleum
5	08 Edible fruit, nuts, peel of citrus fruit, melons	Food

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Partner Country Method: The South African Case Study

Trade Mispricing (Commodities) for South Africa – Inflows 2012

Rank	Country
1	Ghana
2	China
3	Germany
4	Netherlands
5	United Kingdom
6	Zimbabwe
7	Nigeria
8	United States
9	Mali
10	Botswana

Rank	Product Category Imports	Sector
1	71 Pearls, Precious stones, metals and coins	Mining
2	87 Vehicles, other railway, tramway	Iron and Steel
3	27 Mineral fuels, oils and distillation products	Petroleum
4	84 Machinery, nuclear reactors, boilers	Machinery and Equipment
5	85 Electrical, electronic equipment	Electrical Machinery

Rank	Product Category: Exports	Sector
1	27 Mineral fuels, oils and distillation products	Petroleum
2	26 Ores, slag and ash	Iron and Steel
3	87 Vehicles, other railway, tramway	Iron and Steel
4	71 Pearls, Precious stones, metals and coins	Mining
5	84 Machinery, nuclear reactors, boilers	Machinery and Equipment

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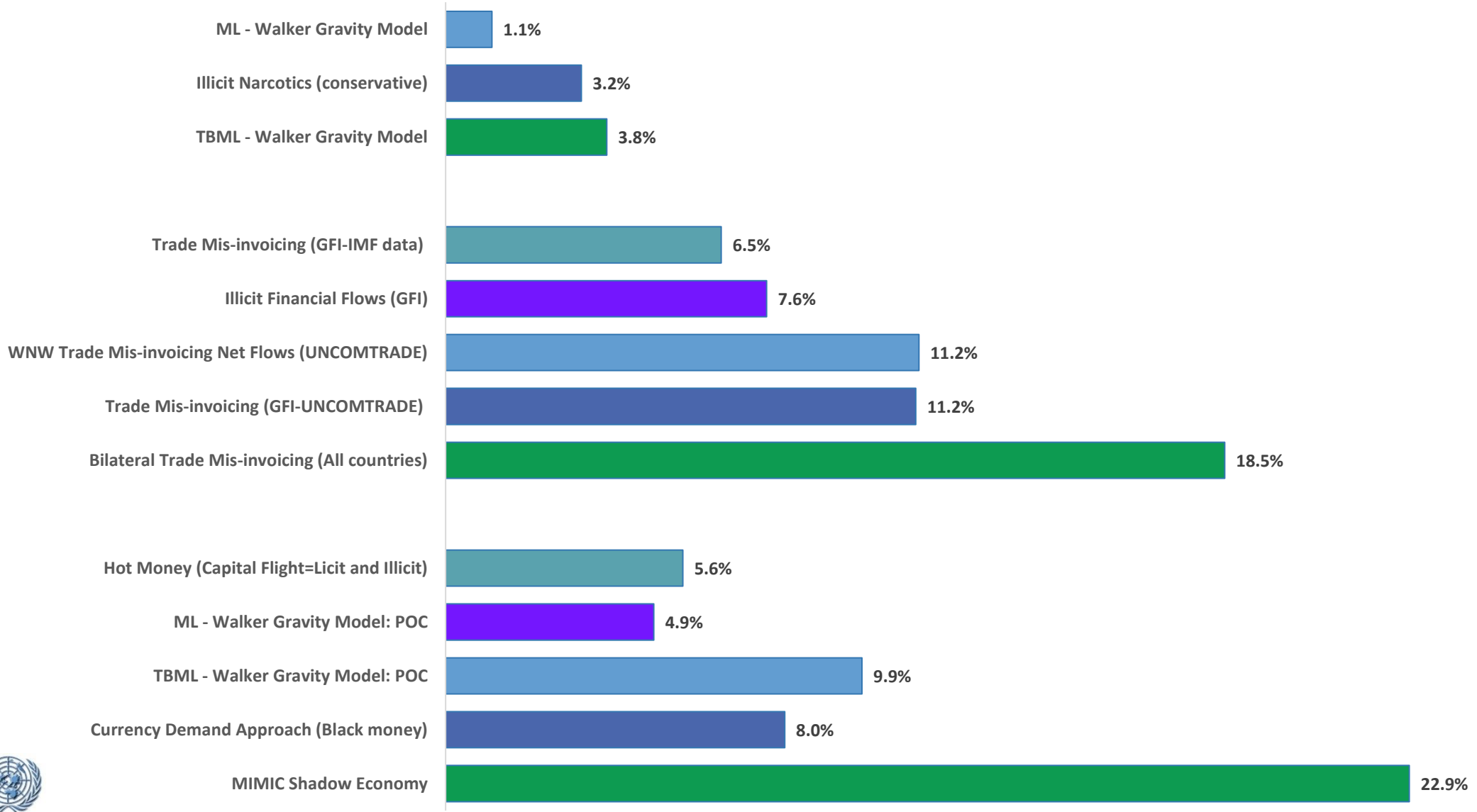
Partner Country Method: The South African Case Study

The results from the research - 2012



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Partner Country Method: The South African Case Study

Comments and insights

Description	GFI Trade Misinvoicing Outfl	FIC GFI method Trade Misinvoici	IL: FIC Walker method Trade
Data So		CC C)	
Meth	en S cour ed t	am isi utf	
Assump	% valic to d o fc cou	am isi utf	

- IMF DOTS data is FOB so c.i.f. adjustment not relevant across the board, therefore this model under-estimates the problem
- Services not accounted for therefore the problem is under-stated
- Source and destination problems

- See GFI Trade Misinvoicing notes
- Data variance accounts for 40% of the problem based on the way the data is compiled
- Source and destination problems

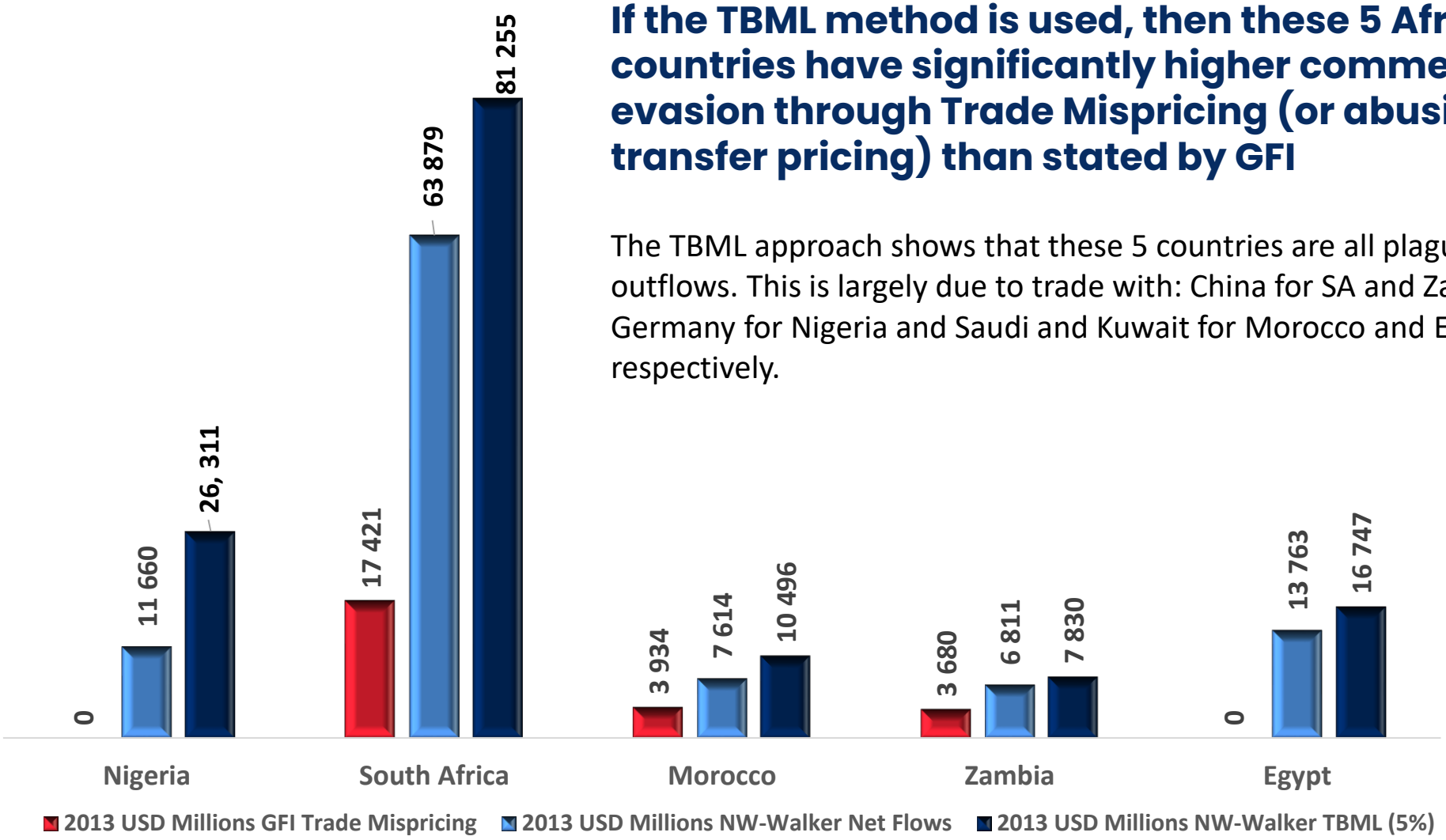
- Services not accounted for therefore the problem is under-stated
- Data variance could account for some of the problem Source and destination problems
- Increasing TBML trends are consistent with international literature.

"2006 FATF Study highlighted the increasing attractiveness of TBML as a method of laundering funds, as controls on laundering of funds through misuse of the financial system (both formal and alternate) and through physical movement of cash (cash smuggling) become tighter"

- MLs exploit weak customs authorities (and processes) in developing countries to launder money using trade
- **About 70% of 2013 is with China, miscellaneous category (gold).** See Cassara

Partner Country Method: The South African Case Study

Trade Mispricing & Trade Based Money Laundering – 5 African Countries



If the TBML method is used, then these 5 African countries have significantly higher commercial tax evasion through Trade Mispricing (or abusive transfer pricing) than stated by GFI

The TBML approach shows that these 5 countries are all plagued by net outflows. This is largely due to trade with: China for SA and Zambia; Germany for Nigeria and Saudi and Kuwait for Morocco and Egypt respectively.

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Partner Country Method: The African Case Study

Trade Mispricing & Trade Based Money Laundering – 5 African Countries

Nigeria outflow 2014	Dollar millions
Germany	3 315
South Korea	2 344
Brazil	1 352
Belgium	1 250
Japan	1 036
China	862
Switzerland	820
Latvia	646
Argentina	568
Taiwan (Chinese Taipei)	423

Nigeria inflow 2014	Dollar millions
China	5 677
Italy	3 569
Netherlands	3 018
Turkey	2 109
United Kingdom	1 898
France	1 615

South Africa outflow 2014	Dollar millions
China	33 769
Nigeria	8 080
Saudi Arabia	7 174
Hong Kong	2 806
United Kingdom	2 280
United States	2 274

South Africa inflow 2014	Dollar millions
Zimbabwe	1 866
India	1 171
Germany	1 124
Netherlands	1 110
Cote d'Ivoire	864
Belgium	719
United Kingdom	648
Hong Kong	640
Tanzania	639
Israel	611

Zambia outflow 2014	Dollar millions
China	3 048
United Arab Emirates	1 117
South Korea	370
Saudi Arabia	261
South Africa	229
Kuwait	227
Italy	211
India	179
Singapore	137
United Kingdom	129

Egypt outflow 2014	Dollar millions
Kuwait	3 276
Germany	2 692
Malta	857
China	774
Saudi Arabia	640
Greece	592
Italy	575
France	475
United States	353
United Kingdom	287
Luxembourg	48
Tanzania	48
Japan	42
Botswana	36

Egypt inflow 2014	Dollar millions
China	2 787
United Arab Emirates	2 084
United States	1 521
Russia	1 314
Netherlands	982
India	921
Turkey	664
Belgium	660
Indonesia	605
Italy	513
Ukraine	339
Belgium	334
Italy	292
Mexico	244

Morocco inflow 2014	Dollar millions
Spain	1 959
France	947
Netherlands	339
Sweden	234
Singapore	187
Romania	158
Belgium	156
United Kingdom	153
Italy	133
Portugal	125

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Partner Country Method: The South African Case Study

Data anomalies and challenges – using DOTS and UNCOMTRADE data and approaches

- **Mapping:** Linking standardised (or harmonised) national I-O tables to international bilateral trade matrices is problematic, resulting in classification anomalies.
- **Coverage** of data is not complete in all countries, some developing countries do not report and mirror data is used. Quarterly data updates result in analysis inconsistencies
- **Reporting:** Exporters and importers may report the same trade differently due to various factors e.g. (import cost, insurance and freight), timing, FOB, inclusion and exclusion of some commodities, etc…
- **UNCOMTRADE reporting standards:** creates variances in reporting as some countries use General method, other use Special, some apply strict rules others not
- **UNCOMTRADE AND IMF DOTS Source and destinations countries:** Reported trade is affected by transit destinations and reporting anomalies of source and destination countries. This results in incorrect statements of the variances (Up/down)
- **Services:** Missing traded services hence the need to include the Hot Money analysis.
- **Clandestine Activities:** Measuring illicit financial flows/TBML is difficult at the macro level since proxies need to be used to estimate clandestine activities not reported

Partner Country Method: The African Case Study

Trade Mispricing & Trade Based Money Laundering – 5 African Countries

TABLE 1: GER RESULTS, $ MILLIONS						
	CONVERSION FACTOR 1.1			CONVERSION FACTOR 1.05		
	2013	2014	2015	2013	2014	2015
GROSS TRADE MISPRICING (EXCLUDING REVERSALS)						
Nigeria	53,457	47,813	–	53,594	45,602	–
South Africa	74,090	67,393	36,841	98,797	87,734	51,176
Morocco	15,690	16,631	–	16,440	17,024	–
Zambia	12,734	12,524	9,284	13,323	13,034	9,697
Egypt	29,976	32,652	–	29,552	31,669	–
NET FLOWS (INCLUDING REVERSALS; INFLOWS LESS OUTFLOWS)						
Nigeria	(5,742)	(19,112)	–	(777)	(13,762)	–
South Africa	60,610	59,577	34,951	53,373	59,022	35,927
Morocco	1,947	2,284	0	4,723	5,179	0
Zambia	1,715	573	359	2,433	1,218	842
Egypt	(804)	(8,971)	–	3,252	(4,796)	–

Trade mispricing for Nigeria, South Africa and Zambia is decreasing. Morocco and Egypt exhibit increasing trade mispricing. Nigeria and Egypt show net inflows, while South Africa, Morocco and Zambia exhibit net outflows.

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Partner Country Method: The South African Case Study

the WCO Study

Matching bilateral trade of HS 6 digit 2010-2015

- South African reported imports from Comtrade
- Partner country reported exports from Comtrade

Account for unavoidable and structural factors

- CIF vs FOB (South Africa reports FOB for exports and thus need no adjustment)
- Chinese re-exports via Hong Kong
- **Apply reliability weights to the dollar-magnitude of the trade gaps**

$$\{1 - |Q^{RSA} - Q^{Partner}|/\max(Q^{RSA}, Q^{Partner})\}$$

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Measuring Trade Anomaly

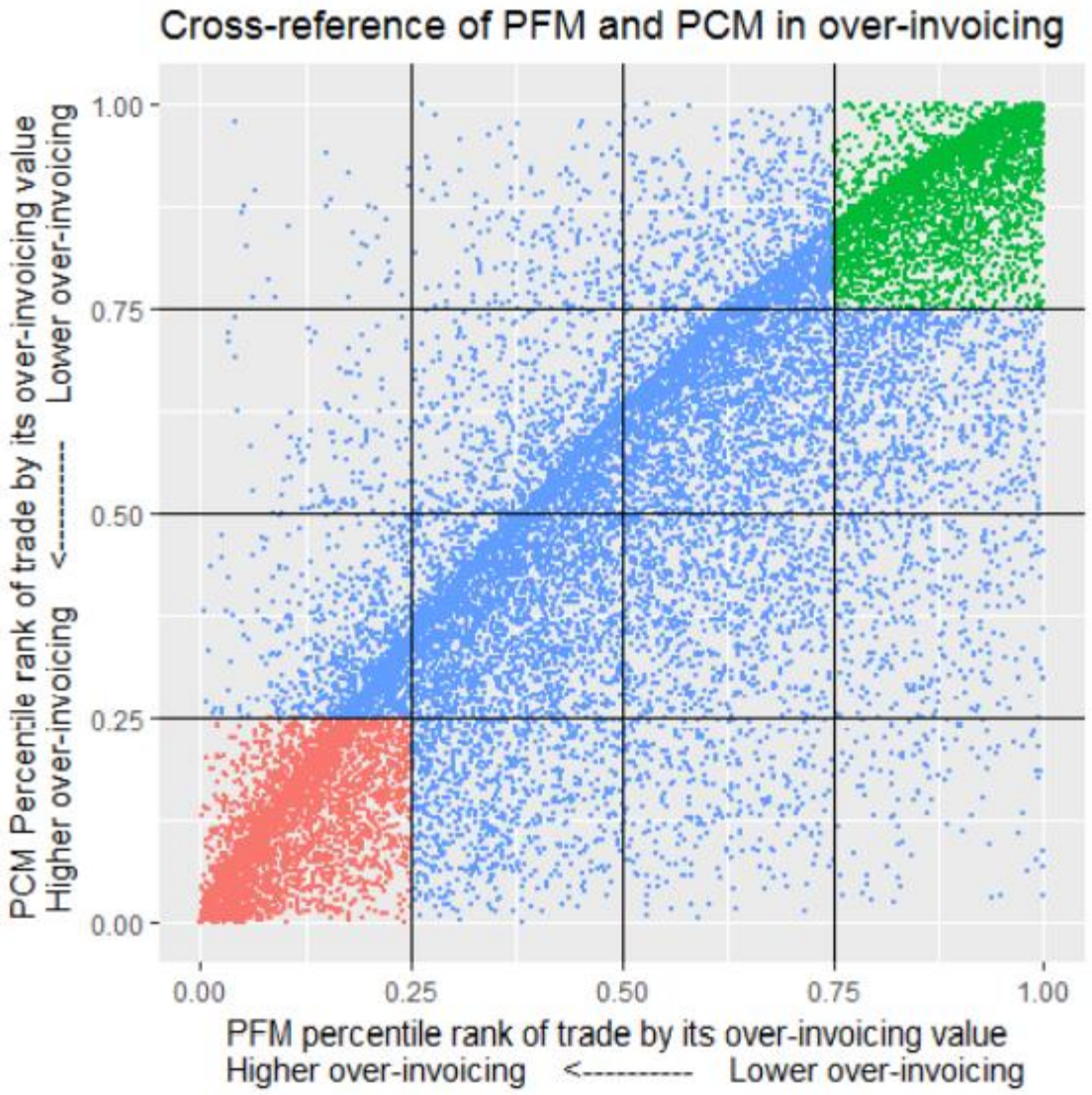
Recap

	Partner Country Method	Price Filter Method
Concept	Trade asymmetries	Abnormal prices
Assumptions	Partner's trade data are accurate	Prices outside price filter -> mispricing
Strengths	Partner country data available also globally	Not rely on partner data
Limitations	Confounding reasons	Endogeneity of statistical filters
Data sources	Trade data, 6-level HS	Transaction-level data
Mitigation of limitations	Involve Customs experts	Involve Customs experts

Source: Bojan Nastav presentation Part II – Methods Partner Country Method

Cross-reference of Two Methods

Practical guidance



Source: WCO. wco-guide-to-customs-valuation-and-transfer-pricing.

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The South African Case Study

PCM and PFM

Table 1

Comparison of Comtrade and SARS Databases: Selected Characteristics of South African Imports, 2010-2015

	Comtrade Database					SARS Database					
	Total Reported ($US, mn)	Detail (percent of total)			Average Reliability Weight (percent)	Total Reported ($US, mn)	Detail (percent of total)			Effective Potential Tariff Rate (percent)	
		Matched	Orphaned	Other			Pass 1	Pass 2	Pass 3	Comtrade	SARS
All years, goods, partners	***$ 526,964***	***69%***	***19%***	***11%***	***57%***	***$ 533,000***	***100%***	***98%***	***94%***	***5.6%***	***4.4%***
Year											
2010	$ 76,179	74%	19%	7%	57%	$ 76,063	100%	97%	94%	5.9%	4.7%
2011	$ 94,757	66%	20%	14%	56%	$ 94,665	100%	98%	95%	5.9%	4.4%
2012	$ 96,247	62%	21%	17%	56%	$ 96,206	100%	98%	93%	5.3%	4.3%
2013	$ 95,898	67%	18%	15%	57%	$ 95,840	100%	98%	94%	5.8%	4.3%
2014	$ 92,141	75%	18%	7%	61%	$ 92,018	100%	98%	94%	5.1%	4.2%
2015	$ 71,743	75%	19%	6%	52%	$ 78,207	100%	99%	96%	5.7%	4.6%
HS-2 digit commodity (ranked in order of significance to overall RSA imports)											
[1] Mineral fuels (HS-27)	$ 118,992	51%	49%	0%	43%	$ 118,493	100%	98%	93%	1.9%	1.2%
[2] Machinery (HS-84)	$ 80,463	61%	9%	31%	53%	$ 81,678	100%	98%	94%	1.8%	1.3%
[3] Electical machinery (HS-85)	$ 54,638	66%	4%	30%	52%	$ 55,450	100%	98%	95%	2.6%	2.1%
[4] Vehicles (HS-87)	$ 48,971	90%	3%	8%	65%	$ 49,601	100%	99%	96%	14.6%	14.1%
[5] Plastics (HS-39)	$ 13,659	94%	6%	0%	68%	$ 13,857	100%	99%	97%	3.4%	3.4%
[6] Optical, medical products (HS-90)	$ 13,440	38%	7%	55%	42%	$ 13,652	100%	97%	93%	0.2%	0.2%
[7] Pharmaceuticals (HS-30)	$ 12,865	94%	2%	3%	60%	$ 13,154	100%	99%	96%	0.1%	0.1%
[8] Organic chemicals (HS-29)	$ 9,651	82%	17%	1%	62%	$ 9,683	100%	99%	92%	0.6%	0.6%
[9] Chemical products, misc. (HS-38)	$ 9,230	84%	16%	0%	68%	$ 9,355	100%	99%	98%	0.8%	0.7%
[10] Rubber (HS-40)	$ 7,882	84%	7%	8%	59%	$ 8,003	100%	99%	96%	12.2%	11.5%
Partner countries (ranked in order of significance to overall RSA imports)											
[1] China	$ 81,335	85%	3%	12%	58%	$ 86,572	100%	99%	95%	9.7%	8.9%
[2] Germany	$ 45,344	75%	5%	19%	67%	$ 46,320	100%	99%	97%	4.1%	3.2%
[3] USA	$ 38,804	67%	9%	24%	53%	$ 39,444	100%	98%	94%	5.2%	4.0%
[4] Saudi Arabia	$ 32,991	8%	92%	0%	66%	$ 33,421	100%	99%	95%	1.0%	0.3%
[5] India	$ 24,928	86%	8%	6%	54%	$ 25,295	100%	99%	97%	8.5%	7.8%
[6] Nigeria	$ 22,371	79%	21%	0%	26%	$ 20,829	100%	100%	98%	0.0%	0.0%
[7] United Kingdom	$ 18,872	82%	4%	14%	62%	$ 19,160	100%	98%	95%	3.0%	2.6%
[8] Japan	$ 16,712	79%	4%	17%	47%	$ 16,893	100%	99%	96%	9.9%	8.6%
[9] Italy	$ 14,415	78%	2%	19%	62%	$ 14,619	100%	99%	96%	6.8%	5.6%
[10] France	$ 13,619	81%	6%	13%	61%	$ 13,888	99%	97%	94%	5.5%	4.9%

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The South African Case Study

PCM and PFM

Table 2.

Comparison of PCM and PCF Analyses of South African Imports, 2010-2015

	Partner Country Method (Comtrade database)					Price Filter Method (SARS database)				
	Total Analyzed ($US, mn)	Potential Misvaluation (percent of total)		Effective Potential Tariff Rate (percent)		Total Analyzed ($US, mn)	Potential Mispricing (percent of total)		Effective Potential Tariff Rate (percent)	
		High	Low	High	Low		High	Low	High	Low
All years, goods, partners	***$ 365,374***	***9%***	***12%***	***1.8%***	***8.1%***	***$ 502,811***	***6%***	***24%***	***2.7%***	***6.8%***
HS-2 digit commodity (ranked in order of significance to overall imports)										
[1] Mineral fuels (HS-27)	$ 60,367	8%	2%	1.6%	0.4%	$ 109,895	1%	2%	0.4%	1.4%
[2] Machinery (HS-84)	$ 48,705	12%	10%	0.5%	1.7%	$ 76,674	15%	30%	0.6%	2.8%
[3] Electical machinery (HS-85)	$ 35,814	13%	11%	0.7%	4.8%	$ 52,441	11%	51%	1.5%	3.1%
[4] Vehicles (HS-87)	$ 43,975	6%	13%	4.3%	12.2%	$ 47,619	6%	8%	11.4%	17.0%
[5] Plastics (HS-39)	$ 12,792	8%	13%	1.2%	3.6%	$ 13,489	1%	24%	2.3%	4.5%
[6] Optical, medical products (HS-90)	$ 5,163	10%	14%	0.1%	0.1%	$ 12,651	16%	55%	0.1%	0.4%
[7] Pharmaceuticals (HS-30)	$ 12,126	11%	16%	0.0%	0.1%	$ 12,629	10%	20%	0.0%	0.2%
[8] Organic chemicals (HS-29)	$ 7,886	10%	7%	0.2%	0.4%	$ 8,881	3%	18%	0.5%	0.7%
[9] Chemical products, misc. (HS-38)	$ 7,723	9%	10%	0.3%	0.4%	$ 9,160	8%	16%	0.2%	1.3%
[10] Rubber (HS-40)	$ 6,657	7%	14%	3.9%	7.0%	$ 7,675	3%	22%	10.2%	14.0%
Partner country exporters (ranked in order of significance to overall imports)										
[1] China	$ 69,503	12%	16%	2.3%	19.8%	$ 82,415	2%	82%	2.2%	12.3%
[2] Germany	$ 34,172	6%	20%	0.6%	4.6%	$ 44,735	11%	11%	5.1%	1.6%
[3] USA	$ 25,896	12%	8%	2.3%	5.9%	$ 37,249	13%	8%	3.9%	4.7%
[4] Saudi Arabia	$ 2,777	13%	6%	0.3%	1.7%	$ 31,675	0%	2%	0.2%	0.4%
[5] India	$ 21,470	12%	7%	3.2%	9.1%	$ 24,584	2%	26%	4.4%	9.8%
[6] Nigeria	$ 17,709	2%	0%	0.0%	0.3%	$ 20,453	1%	1%	0.0%	0.2%
[7] United Kingdom	$ 15,428	9%	13%	0.8%	2.3%	$ 18,287	8%	11%	2.3%	1.2%
[8] Japan	$ 13,152	7%	8%	1.4%	12.6%	$ 16,150	8%	6%	6.6%	7.8%
[9] Italy	$ 11,303	13%	8%	2.3%	6.2%	$ 14,009	12%	18%	4.7%	5.3%
[10] France	$ 11,038	9%	14%	2.7%	3.6%	$ 13,066	11%	9%	3.7%	6.1%

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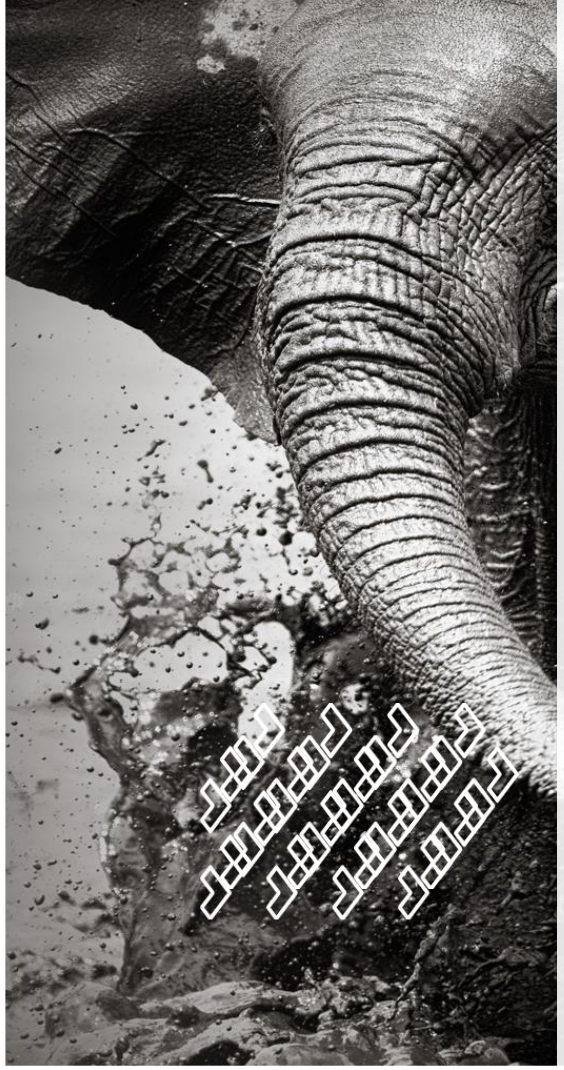
WCO(2018). Illicit Financial Flows via Trade Mis-invoicing Study Report 2018



02

Tutorial

Drawing on a data sample to compile the results for PCM

Partner Country Method: The South African Case Study

Steps to follow

1 Data downloading

A's imports from B

A's export to B

B's exports to A

B's imports from A

2 Adjust for exchange rate

3 Conversion Factor adjustment: FOB vs CIF

4 Conversion Factor adjustment: time lags

5 Calculate difference

5 Calculate difference

6 Adjust directions

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01 Open Excel file entitled: Tutorial

02 Calculate the exchange rate values

03 Calculate the adjustment using the conversion rates
Adjust the conversion rates with actual rates where this information is available

04 Formulas have been left in for your ease of reference that calculate the extent of the trade asymmetry

05 Move to the Results sheet and estimate the direction of the mis-invoicing

06 Attempt to do so on your own. Refer to the SOLUTIONS sheet to see how this was approached and to analyse the formulas

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