

Presentation at the Workshop on  
TAX, POVERTY AND FINANCE FOR DEVELOPMENT  
UNIVERSITY OF ESSEX, 6-7 JULY 2006  
Association for Accountancy and Business Affairs  
in association with the Tax Justice Network

## Estimates of Capital Movements from African Countries to the U.S. through Trade Mispricing

Simon J. Pak  
Associate Professor of Finance  
The Pennsylvania State University  
Great Valley School of Graduate Professional Studies  
Tel: (610)725-5343 email: [SimonPak@psu.edu](mailto:SimonPak@psu.edu)

\* I wish to thank Dr. Maria E. de Boyrie at New Mexico State University for her help in literature review.

### ABSTRACT

This study attempts to estimate the magnitude of capital outflows from every country in Africa to the U.S. by evaluating every reported import and export transactions between African countries and the United States during the ten year period 1996 - 2005. The capital outflows from Africa to the U.S. grew significantly, from \$1.9 billion in 1996 to \$4.9 billion in 2005, through both low-priced export and high-priced import.

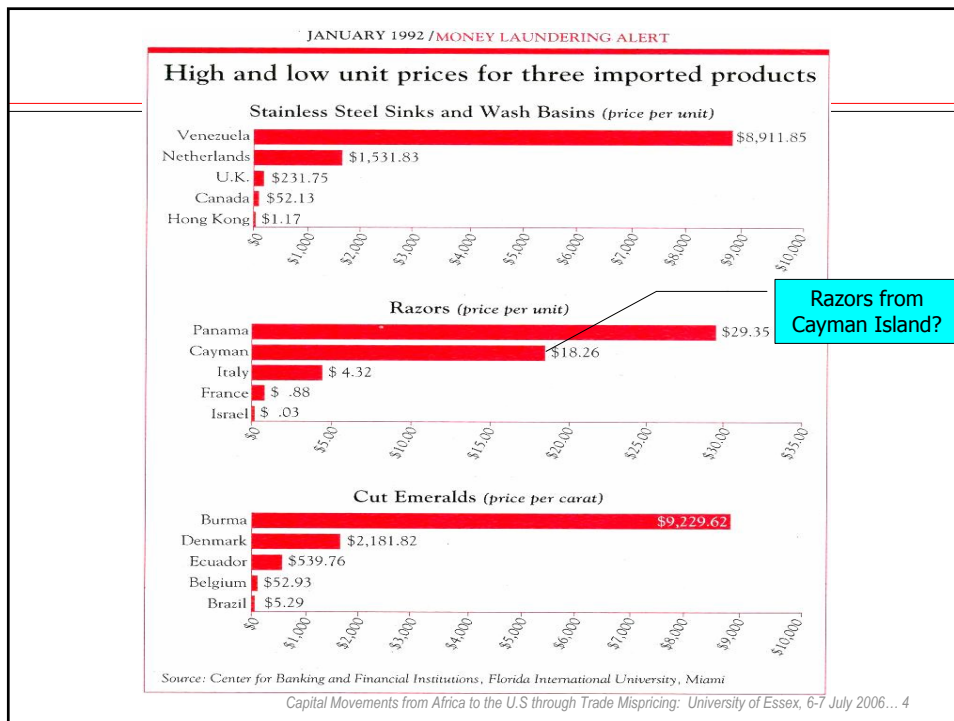
For some countries such as South Africa, Morocco, Ghana, Gabon, Botswana, Lesotho, Madagascar, Swaziland, and Namibia, capital outflows took place more through low-priced export than through high-priced import during 2000-2006 period. For some other countries such as Egypt, Algeria, Nigeria, Kenya, Ethiopia, Cameroon, Senegal, Guinea and Uganda, capital outflows took place more through high-priced import than through low-priced export.

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 2*

# Outline

- Examples of Abnormal Prices in Trade
- Trade mispricing & Capital Movement
- What Causes Trade Mispricing?
- How to Detect Abnormally Priced Trades in a cost effective way? (de Boyrie, Pak, Zdanowicz)
- Applications of Price Filters
  - Chen/Sunrider vs. U.S.– Customs document fraud & tax evasion (Pak and Zdanowicz)
  - Effects of 1998 Swiss Money Laundering Law (de Boyrie, Pak, and Zdanowicz)
- Estimates of Capital Outflows from Africa to U.S. 1996-2005

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 3



## U.S. Imports At High Average Price

<u>COMMODITY</u>	<u>COUNTRY</u>	<u>COUNTRY AVERAGE PRICE</u>	<u>WORLD AVERAGE PRICE</u>
Untrimmed Pillowcases (No)	France	909.29	.62
Unrecorded Mag. Discs (No)	Spain	698.16	.43
Sand (Ton)	Spain	1,993.67	11.20
Flashbulbs (No)	France	321.90	.66
Balls For Ball Point Pens(No)	France	1.43	.007
Single Edge Razor Blades (No)	France	5.33	.04
Cordless Telephones (No)	France	4,232.50	47.65
Raw Cane Sugar (Kg)	U.K.	1,407.00	.50
Slip Joint Pliers (No)	U.K.	489.75	.88

Over-priced Import:  
Capital Flight? Money Laundering? Income Tax Evasion?

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 5*

## U.S. Exports At Low Average Prices

<u>COMMODITY</u>	<u>COUNTRY</u>	<u>COUNTRY AVERAGE PRICE</u>	<u>WORLD AVERAGE PRICE</u>
HERRING-BONE TIRES (No)	FRANCE	7.69	192.25
ENRICHED 235 URANIUM (KG)	SPAIN	15.50	172.22
MACHINE GUNS (No)	FRANCE	364.08	2,022.67
MILITARY RIFLES (No)	U.K.	106.87	387.55
ERYTHROMYCIN (GM)	IRAN	.08	1.20

Under-priced Export:  
Capital Flight? Money Laundering? Income Tax Evasion?

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 6*

## Trade Mispricing & Capital Movement

- **Two Views on Trade Misinvoicing**
  - a measure of Capital Flight
    - Ndikumana and Boyce, *Development and Change* 1998
    - Zhu, Li and Epstein (2005)
  - a tool to evade tax
    - Gibson & Tsakalotos (1993), Hermes et. al (2003) argue trade misinvoicing may be unrelated to capital flight.
- **Trade misinvoicing/mispricing facilitates**
  - capital movement
  - tax reduction
  - duty reduction
  - money laundering
- **This paper attempts to estimate the amount of capital movement through trade misinvoicing from African countries to the U.S. based on the U.S. Customs data, regardless of the motivation of the misinvoicing**

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 7

## Estimating Trade Misinvoicing in Africa

- **Mostly using IMF's Direction of Trade Yearbooks (DOT)**
  - Difference between the amount of world trade as reported by S. Africa and the amount trade as reported by South Africa's trading partners in the IMF's DOT – Underinvoicing during 1970-80: Export 20%, Import 4% (Rustomjee, *Transformation, 1991*)
  - Boyce & Ndikumana (*J. of Dev. Studies, 2001*) – Most of 25 low income sub-Saharan countries: Substantial export underinvoicing (using IMF's DOT yearbooks)
    - Identified Nigeria as the one with the largest export underinvoicing and import overinvoicing, totaling \$16 billion
- **IMF's DOT – aggregated reporting, quality of data**
- **This study uses disaggregated U.S. Customs Import/Export Data**

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 8

## What Causes Trade Mispricing?

- **May be related to**
  - Capital flight
  - Import duty fraud
  - Income tax evasion / Transfer pricing
  - Money laundering
- **Other Explanations:**
  - Clerical/Recording errors
  - Product heterogeneity for a given HS10 code
    - \$25,000 fax machine from Japan – prototype industrial sample

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 9

## How to Detect Abnormal Pricing?

“Money Laundering and Income Tax Evasion: The Determination of Optimal Audits and Inspections to Detect Abnormal Prices in International Trade,” *Journal of Financial Crime*, Vol. 12, No. 2, 2004. (de Boyrie, M.E., Pak, S.J., and Zdanowicz, J. S.)

- **Audits & Inspections – Practices**
  - Customs Agents
    - Lack of benchmark pricing data - Difficult to determine abnormality
  - Pre Shipment Inspection firms
    - All specified inbound cargos inspected
- **Challenges in Detection**
  - Over 50 million transactions annually in U.S. Exports and Imports
    - Examination of trade documents
    - Physical inspection of cargo
    - Delays in the movement of goods

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 10

## How to Detect Abnormal Pricing?

- **An Alternative Statistical Approach**
  - Determine the benchmark upper and lower bounds of prices
    - Based on statistical Analysis of historical prices
    - For each commodity category by country
  - Transactions with prices outside the benchmark prices
    - Higher probability of being abnormal than the population
    - The narrower bounds of the benchmark prices, the more numerous the transactions with prices outside the benchmark prices

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 11*

## Criteria for Price Abnormality: A Price Filter Matrix

- **Price Filter Matrix may be constructed from the U.S. Trade data:**
  - For each commodity code and each country
    - The average price, the standard deviation, upper- and lower quartile prices

Upper bound = the mean +  $\alpha\sigma$  or **Upper Quartile Price**  
Lower bound = the mean -  $\alpha\sigma$  or **Lower Quartile Price**

- Total Number of Cells in 1999  
= (8,635 + 17,179) x (233+1) = 6.04 million cells

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 12*

## Why use Upper- and Lower- Quartiles?

- **IRS Reg 482 on transfer pricing**
- **Effectiveness of Inter-quartile Price Filters**
  - Probabilities of an Importer/Exporter having more than half of transactions with prices above **the Upper Quartile Price:**
    - 1 in 26,000 chances (0.004%) with a total of **50** transactions
    - 1 in 47 million chances ( $2.13 \times 10^{-6}$  %) with a total of **100** transactions
    - 1 in 114 trillion chances ( $8.78 \times 10^{-13}$  %) with a total of **200** transactions
  - Probabilities of an Importer/Exporter having more than half of transactions with prices above **the 4<sup>th</sup> Quintile Price:**
    - 1 in 2 million chance ( $4.92 \times 10^{-5}$ %) with a total of **50** transactions
    - 1 in 193 billion chance ( $5.18 \times 10^{-10}$ %) with a total of **100** transactions
    - 1 in  $1.31 \times 10^{+21}$  chance ( $7.63 \times 10^{-20}$ %) with a total of **200** transactions

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 13*

## DATA SOURCE

- **U.S. Merchandise Trade Data from U.S. Census Bureau**
- **Two CD's each month**
  - Contain all import (>\$1,250) and export (>\$2,500) transactions
    - Quantity & Dollar value
    - Ten digit harmonized commodity code
      - 8,890 export codes and 16,862 import codes in 2005
    - Country – 230 countries in 2005
    - Customs district – 46 customs districts
    - Month of export or import

Dec 2005 DVD	Exports	Imports
Disk size	410 MB	817 MB
Transactions	25,764,503	47,406,763
Records	1.25 million	1.76 million

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 14*

## Price Matrix for U.S. Import from Mexico

Price Matrix: 1998 US Imports from Mexico				US-World Trades			US- Mexico Trades			
HS Code	Description	Unit	Trans	Lower Oil	Median	Upper Oil	Trans	Lower Oil	Median	Upper Oil
010110010	HORSES, LIVE, PUREBRED BREEDING, MALE	NO	307	2000.0000	4489.8995	9632.0000	27	235.2653	400.0000	900.0000
010110020	HORSES, LIVE, PUREBRED BREEDING, FEMALE	NO	343	2864.0000	3888.1829	4743.6000	0	0.0000	0.0000	0.0000
0101190010	HORSES, LIVE, IMPORTED FOR IMMEDIATE SLAUGHTER, NESOI	NO	284	491.5975	519.4828	554.3205	50	487.8462	491.5975	519.4020
0101190000	HORSES, LIVE, NESOI	NO	4045	1538.2654	2277.8287	13812.3214	234	469.2500	670.1951	785.0886
0101201000	ASSES, LIVE, PUREBRED BREEDING	NO	2	2000.0000	2250.8800	2500.0000	0	0.0000	0.0000	0.0000
0101202000	ASSES, LIVE, EXCEPT PUREBRED BREEDING ANIMALS	NO	3	43.8506	1023.5800	1929.0000	0	0.0000	0.0000	0.0000
0101204000	MULES AND HINNIES, LIVE, NESOI	NO	2	1000.0000	1250.8800	1500.0000	0	0.0000	0.0000	0.0000
0102100010	BOVINE ANIMALS, LIVE, PUREBRED BREEDING, DAIRY, MALE	NO	11	289.1630	736.4286	2081.0000	0	0.0000	0.0000	0.0000
0102100020	BOVINE ANIMALS, LIVE, PUREBRED BREEDING, DAIRY, FEMALE	NO	87	766.0115	847.8838	1062.6250	0	0.0000	0.0000	0.0000

Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 15

## Price Matrix for U.S. Export to Mexico

Price Matrix: 1998 US Exports to Mexico				US-World Trades			US- Mexico Trades			
HS Code	Description	Unit	Trans	Lower Oil	Median	Upper Oil	Trans	Lower Oil	Median	Upper Oil
010110000	HORSES, LIVE, PUREBRED BREEDING	NO	829	2501.8532	5840.7708	16861.5000	46	971.7391	1104.9565	1500.0000
0101190000	HORSES, LIVE, EXCEPT PUREBRED BREEDING ANIMALS	NO	1940	543.6221	1680.8800	5053.0000	67	1000.0000	1143.8462	1507.2368
0101200000	ASSES, MULES AND HINNIES, LIVE	NO	26	260.0769	686.7727	1599.0000	1	374.7937	374.7937	374.7937
0102100010	BOVINE ANIMALS, LIVE, PUREBRED BREEDING, DAIRY, MALE	NO	71	727.6512	1080.4255	1296.0400	58	710.5263	980.3125	1136.9946
0102100020	BOVINE ANIMALS, LIVE, PUREBRED BREEDING, DAIRY, FEMALE	NO	316	734.2367	1030.8379	1220.0711	246	669.5213	982.9125	1074.8600
0102100030	BOVINE ANIMALS, LIVE, PUREBRED BREEDING, EXCEPT DAIRY, MALE	NO	254	1008.5714	1528.7791	2700.0000	91	819.5200	1033.3333	1314.6750
0102100050	BOVINE ANIMALS, LIVE, PUREBRED BREEDING, EXCEPT DAIRY, FEMALE	NO	140	448.9821	597.8892	861.1111	108	433.3864	560.3145	597.0892
0102900000	BOVINE ANIMALS, LIVE, NESOI	NO	5180	443.1697	473.2164	545.0950	3143	443.4541	466.7957	517.4705
0103100000	SWINE, LIVE, PUREBRED BREEDING ANIMALS	NO	128	219.4196	395.3901	624.2500	49	180.1425	284.2109	427.4048
0103910000	SWINE, LIVE, NESOI, WEIGHING LESS THAN 50 KG EACH	NO	14	40.5910	51.3672	67.7910	5	49.9135	67.7910	402.1462
0103920000	SWINE, LIVE, NESOI, WEIGHING 50 KG OR MORE EACH	NO	887	56.4963	71.6708	73.2748	879	56.4963	71.6708	73.2748
0104100000	SHEEP, LIVE	NO	935	39.2055	40.8119	48.7558	831	39.2055	40.5725	47.1514
0104200000	GOATS, LIVE	NO	218	32.3856	39.9340	43.1617	200	32.3856	38.4097	43.1617
0105110010	CHICKENS, LIVE, BREEDING STOCK, WHETHER OR NOT PUREBRED, WEIGHING NOT OVER 185 G EACH, LAYER-TYPE (EGG-TYPE)	NO	337	1.2500	3.6711	4.4886	74	1.2124	1.5688	1.6985
0105110020	CHICKENS, LIVE, BREEDING STOCK, WHETHER OR NOT PUREBRED, WEIGHING NOT OVER 185 G EACH, BROILER-TYPE (MEAT-TYPE)	NO	2481	0.7300	1.3863	2.5956	62	2.0038	2.3484	8.0000

Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 16



## Outline

- Trade mispricing & Capital Movement
- What Causes Trade Mispricing?
- How to Detect Abnormally Priced Trades in a cost effective way? (de Boyrie, Pak, Zdanowicz)
- **Applications of Price Filters**
  - Chen/Sunrider vs. U.S.– Customs document fraud & tax evasion (Pak and Zdanowicz)
  - Effects of 1998 Swiss Money Laundering Law (de Boyrie, Pak, and Zdanowicz)
- **Estimates of Capital Outflows from Africa to U.S. 1996-2005**

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 17*

## An Illustration: Chen/Sunrider case

- **Chen/Sunrider was accused of over-invoiced imports**
  - Imported herbs at very high prices from China and Taiwan between 1989 and 1991 to evade U.S. income tax
  - Two Court Cases
    - IRS vs. Chen/Sunrider: IRS Section 482 violation
    - The US vs. Chen/Sunrider: US Customs Document Fraud case (Dr. John Zdanowicz at Florida International University and Simon Pak at Penn State University were the expert witness consultants for the U.S.)

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 18*

## Price Filter - Chen/Sunrider case

TABLE 3-1 1990 Imports of "Other Mushrooms" by All Other US Importers  
(HTSUSA=0712302000,KG) from China (Taiwan)

	Entry No.	Line No.	Date	Qty (KG)	Line Value	Price per KG	
1	EntryNo....	001	900511	910	\$3,576	\$3.93	<i>minimum price</i>
2	EntryNo....	001	901016	2,939	\$21,222	\$7.22	
3	EntryNo....	003	900129	1,701	\$14,870	\$8.74	
4	EntryNo....	003	900827	227	\$2,160	\$9.52	
5	EntryNo....	009	900810	1,288	\$13,202	\$10.25	
6	EntryNo....	001	900606	1,588	\$17,350	\$10.93	
7	EntryNo....	001	901213	98	\$1,146	\$11.69	
8	EntryNo....	001	900918	1,165	\$16,400	\$14.08	
9	EntryNo....	001	900313	3,685	\$59,138	\$16.05	
10	EntryNo....	001	900430	3,685	\$59,293	\$16.09	
11	EntryNo....	001	900424	454	\$7,700	\$16.96	<i>lower quartile price</i>
12	EntryNo....	001	900612	680	\$12,300	\$18.09	
13	EntryNo....	001	901227	320	\$8,000	\$25.00	
14	EntryNo....	001	900604	55	\$1,635	\$29.73	
15	EntryNo....	001	900126	2,703	\$86,360	\$31.95	
16	EntryNo....	001	901203	100	\$3,200	\$32.00	
17	EntryNo....	001	900207	2,613	\$89,222	\$34.15	
18	EntryNo....	001	900207	2,871	\$99,502	\$34.66	
19	EntryNo....	001	900314	2,830	\$98,612	\$34.85	
20	EntryNo....	001	900515	1,388	\$48,520	\$34.96	
21	EntryNo....	001	900517	2,703	\$94,525	\$34.97	<i>median price</i>

Continued ...

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 19

## Price Filter - Chen/Sunrider case

TABLE 3-1 1990 Imports of "Other Mushrooms" by All Other US Importers  
(HTSUSA=0712302000,KG) from China (Taiwan)

	Entry No.	Line No.	Date	Qty (KG)	Line Value	Price per KG	
21	EntryNo....	001	900517	2,703	\$94,525	\$34.97	<i>median price</i>
22	EntryNo....	001	900212	2,703	\$94,526	\$34.97	
23	EntryNo....	001	900326	2,703	\$94,526	\$34.97	
24	EntryNo....	001	900906	2,703	\$95,002	\$35.15	
25	EntryNo....	001	901009	2,703	\$95,002	\$35.15	
26	EntryNo....	001	900802	272	\$9,564	\$35.16	
27	EntryNo....	001	900723	2,695	\$94,880	\$35.21	
28	EntryNo....	001	900815	1,207	\$42,560	\$35.26	
29	EntryNo....	001	900829	1,207	\$42,560	\$35.26	
30	EntryNo....	001	901001	1,207	\$42,560	\$35.26	
31	EntryNo....	001	901011	1,207	\$42,560	\$35.26	<i>upper quartile price</i>
32	EntryNo....	001	901024	1,207	\$42,560	\$35.26	
33	EntryNo....	001	901217	1,207	\$42,560	\$35.26	
34	EntryNo....	001	900830	1,207	\$42,560	\$35.26	
35	EntryNo....	001	900322	2,762	\$97,542	\$35.32	
36	EntryNo....	001	900409	2,776	\$99,099	\$35.70	
37	EntryNo....	001	900228	1,207	\$43,491	\$36.03	
38	EntryNo....	001	900320	2,703	\$97,446	\$36.05	
39	EntryNo....	001	901001	2,400	\$87,389	\$36.41	
40	EntryNo....	001	900312	91	\$3,368	\$37.01	
41	EntryNo....	001	900709	91	\$3,370	\$37.03	<i>maximum price</i>
	<b>TOTAL</b>			<b>68,261</b>	<b>\$1,971,058</b>	<b>\$28.88</b>	<i>average price</i>

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 20

## 0712302000 OTHER MUSHROOMS [KG]

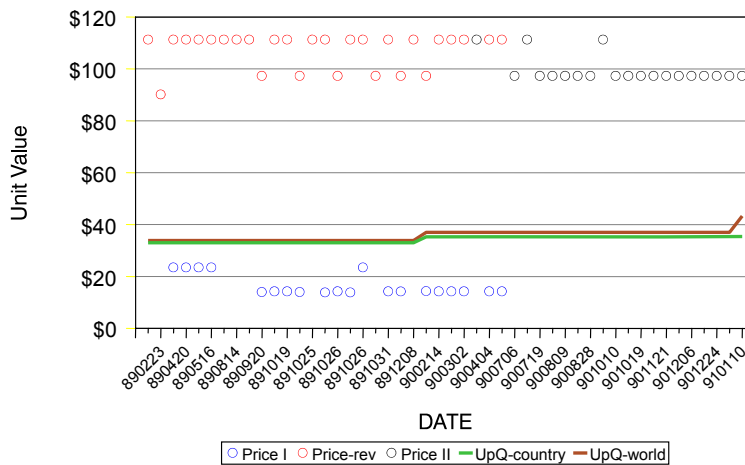
Reference Prices of *US-TAIWAN* Transactions *Excluding* Defendant's Transactions by Year

	<b>1989</b>	<b>1990</b>	<b>1991</b>
Highest	\$41.90	\$37.03	\$39.70
<b>Upper Quartile</b>	\$33.03	\$35.26	\$35.38
Median	\$31.95	\$34.97	\$26.42
Average	\$27.88	\$28.88	\$20.85
Lower Quartile	\$29.19	\$16.96	\$6.50
Lowest	\$1.23	\$3.93	\$3.37

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 21

### Chart 4: Other mushrooms

TSUSA: 0712302000(KG) CHINA(TAIWAN)



Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 22

Chart 5-1: Proportion of Imports with Prices Higher Than  
U.S. - Country Upper Quartile Prices

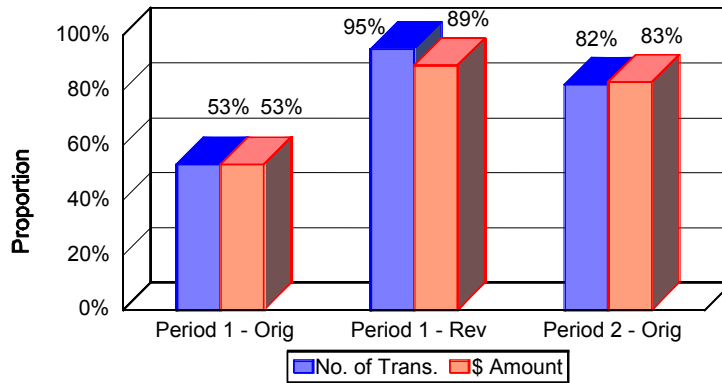
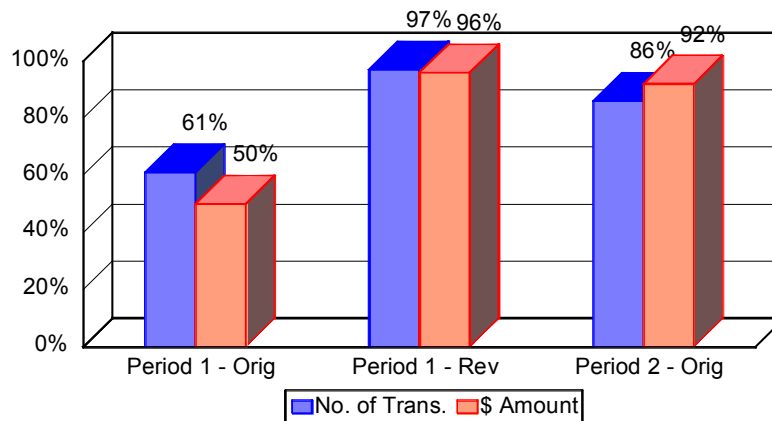


Chart 5-2: Proportion of Imports with Prices Higher Than  
U.S.- World Upper Quartile Prices



## Chen/Sunrider case - The Results

- **IRS vs. Chen/Sunrider**

On the IRS Section 482 violation charge,  
Mr. Chen paid IRS over \$48 million for tax and  
penalty (6 Transfer Pricing Report 842, 3/25/98)

- **The US vs. Chen/Sunrider**

On the Customs Document Fraud charge,  
Mr. Chen Paid \$4 million fine to US Customs and  
sentenced to a two-year jail term

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 25

## Switzerland : 1998 Money Laundering Law

de Boyrie, M.E., Pak, S.J., and Zdanowicz, J.S. "The Impact Of Switzerland's Money Laundering Law On Capital Flows Through Abnor`mal Pricing In International Trade," *Applied Finance and Economics*, Vol. 15, No. 4, February 2005, pp 217-230

**Starting April 1998, bankers and other financial institutions are required to:**

- report *customers* suspected of wrongdoing and suspicious transactions;
- report suspicious *transactions* to Swiss banking authorities; and
- *block the funds* from these transactions.

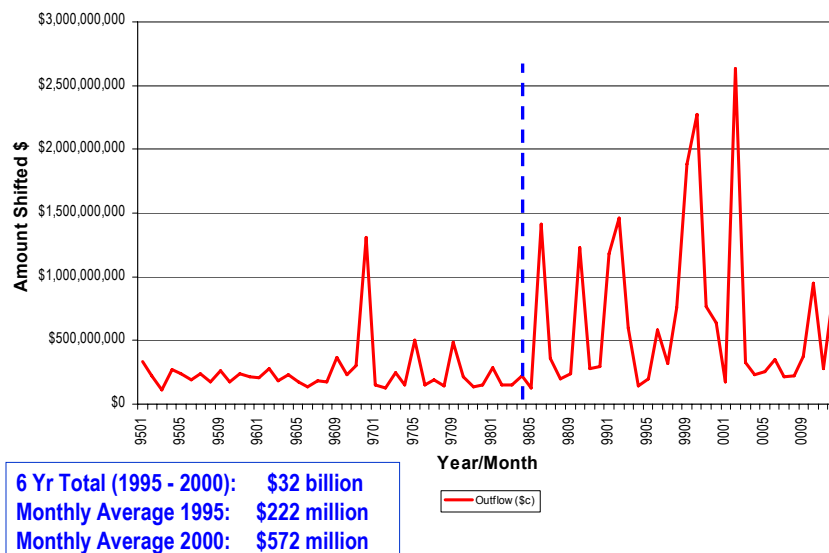
Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 26

## Switzerland: Objective of The Research

- When the regulatory pressure on *financial institutions* to report suspicious transactions increases
  - Money-laundering transactions may shift to other sectors such as *international trade*.
- To determine the impact of Switzerland's money laundering law on the movement of money through false invoicing in international trade:
  - Estimate the amount of money moved
    - through over- and under- invoicing
    - from Switzerland to the U.S between 1995 and 2000

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 27

### Chart 1. Capital Outflows from Switzerland (\$)



Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 28

## Switzerland's 1998 Money Laundering Law

### Impact of the Law on Money Moved Through Swiss-U.S. Trade

Before: \$370 million / month

After: \$776 million / month

Increase: 110%

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 29

## Limitations of Price Matrix Filter Approach

- Heterogeneity for a given HS10
  - Upper/Lower quartile ranges mitigate the problem somewhat.
- Aggregated data
  - By HS10, Month, Country, and Customs District
- No distinction between
  - Related party transactions v.s. unrelated party transactions

Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 30

## Outline

- Trade mispricing & Capital Movement
- What Causes Trade Mispricing?
- How to Detect Abnormally Priced Trades in a cost effective way? (de Boyrie, Pak, Zdanowicz)
- Applications of Price Filters
  - Chen/Sunrider vs. U.S.– Customs document fraud & tax evasion (Pak and Zdanowicz)
  - Effects of 1998 Swiss Money Laundering Law (de Boyrie, Pak, and Zdanowicz)
- **Estimates of Capital Outflows from Africa to U.S. 1996-2005**

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 31*

## Estimates of Capital Outflows from Africa to U.S. 1996-2005

- **Examples of Abnormally Priced Trades**
  - Nigeria – U.S. (2005)
  - Ghana – U.S. (2005)
- **Estimates of Annual Capital Outflows from Africa to U.S. 1996-2005**
  - Sample Countries
  - All Countries in Africa
- **Capital Outflows of the Top 30 African Countries, 2000-2005**

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 32*



## 2005 Nigeria's Low-Priced Export to the U.S.

### 2005 Nigeria's Export to the U.S. - Abnormally Low Priced

Description	Amount	QTY	unit	Price	US-World Median Price	Price Ratio	Month
REPTILES, LIVE	\$2,716	2,757	NO	\$0.99	\$5.11	0.19	JUN
CASHEW NUTS, SHELLED	\$7,194	14,742	KG	\$0.49	\$4.91	0.10	JAN
COFFEE, NOT ROASTED	\$25,105	36,562	KG	\$0.69	\$2.18	0.32	JUN
GUM ARABIC	\$41,280	60,000	KG	\$0.69	\$3.51	0.20	APR
BRAN	\$868,820	9,146	T	\$94.99	\$196.50	0.48	JUL

Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 33

## 2005 Nigeria's High-Priced Import from the U.S.

### 2005 Nigeria's Import from the U.S. - Abnormally High Priced

Description	Amount	QTY	unit	Price	US-World Median Price	Price Ratio	Month
GOLF CLUBS, COMPLETE	\$4,976	1	NO	\$4,976	\$82	61	NOV
OPTICAL FIBERS	\$48,014	35	FBM	\$1,372	\$6	219	NOV
CASSETTE TAPE RECORDERS/PLAYERS	\$5,640	4	NO	\$1,410	\$56	25	AUG
ELECTRIC HAIR DRYERS	\$3,800	1	NO	\$3,800	\$25	154	JUN
GENERATORS, INTERNAL COMBUSTION ENGINES	\$2,596	1	NO	\$2,596	\$63	41	APR
STARTER MOTORS, INT. COMB. ENG.	\$4,363	1	NO	\$4,363	\$41	107	JAN
IGNITION COILS, FOR INT. COMB. ENG.	\$6,192	24	NO	\$258	\$7	36	AUG

Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 34

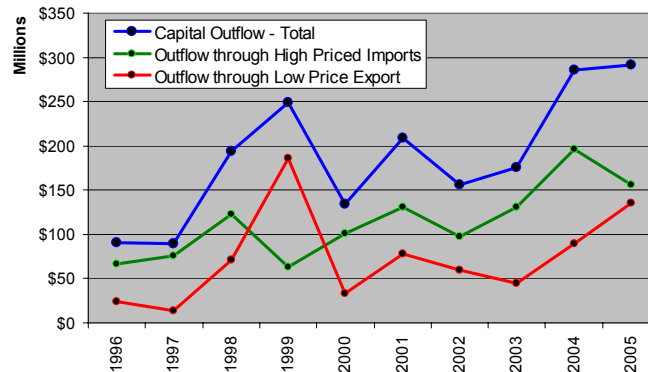
## 1996-2005 Nigeria's Capital Outflow to the U.S.

YEAR	Import from the U.S.	Export to U.S.	Overvalued Import (deviation from Upper Quartile Prices)	Undervalued Export (Deviation from Lower Quartile Prices)	Capital Outflow (\$ million)	% of Trade Volume
1996	\$816	\$5,849	\$67	\$24	\$91	1.4%
1997	\$814	\$6,349	\$76	\$14	\$90	1.3%
1998	\$820	\$4,195	\$123	\$72	\$194	3.9%
1999	\$628	\$4,361	\$63	\$186	\$249	5.0%
2000	\$718	\$10,549	\$101	\$34	\$135	1.2%
2001	\$957	\$8,786	\$131	\$78	\$208	2.1%
2002	\$1,057	\$5,964	\$97	\$59	\$156	2.2%
2003	\$1,029	\$10,394	\$131	\$44	\$175	1.5%
2004	\$1,552	\$16,246	\$196	\$90	\$286	1.6%
2005	\$1,615	\$24,188	\$156	\$135	\$291	1.1%
<b>Total</b>	<b>\$10,007</b>	<b>\$96,881</b>	<b>\$1,141</b>	<b>\$735</b>	<b>\$1,876</b>	<b>1.8%</b>

Capital Movements from Africa to the U.S. through Trade Mispricing; University of Essex, 6-7 July 2006... 35

## Annual Capital Outflows (\$) from Nigeria to the U.S. 1996 - 2005

Capital outflows from Nigeria to the U.S. have: (i) tripled; (ii) been primarily through high priced imports since 1996.



Capital Movements from Africa to the U.S. through Trade Mispricing; University of Essex, 6-7 July 2006... 36

## 2005 Ghana's Low-Priced Export to the U.S.

### 2005 Ghana's Export to the U.S. - Abnormally Low Priced

Description	Amount	QTY	unit	Price	US-World Median Price	Price Ratio	Month
INDUSTRIAL DIAMONDS EXCEPT MINERS	\$9,002	20,835	CAR	\$0.43	\$131.94	0.00	May
DIAMONDS EXCEPT INDUSTRIAL, UNWORKED	\$210,883	5,999	CAR	\$35.15	\$1,361.73	0.03	June
DRUMS	\$3,139	1,792	NO	\$1.75	\$51.91	0.03	March
MAHOGANY WOOD	\$31,017	799	M3	\$38.82	\$958.26	0.04	March
WOODEN BEDS	\$5,000	1,000	NO	\$5.00	\$119.99	0.04	Sept
NONINDUSTRIAL DIAMONDS WEIGHING > 0.5CT EACH	\$11,016	70	CAR	\$157.37	\$2,342.50	0.07	May
VENEER SHEETS & SHEETS FOR PLYWOOD	\$19,456	30,810	M2	\$0.63	\$6.15	0.10	May

Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 37

## 2005 Ghana's High-Priced Import from the U.S.

### 2005 Ghana's Import from the U.S. - Abnormally High Priced

Description	Amount	QTY	unit	Price	US-World Median Price	Price Ratio	Month
GENERATORS FOR INTERNAL COMBUSTION ENGINES	\$60,000	1	NO	\$60,000	\$63.03	952	Nov
GENERATORS FOR INTERNAL COMBUSTION ENGINES	\$544,000	17	NO	\$32,000	\$63.03	508	March
ELECTRIC HAND SAWS, NESOI	\$666,000	25	NO	\$26,640	\$152.77	174	Sept
RADIAL TIRES OF A KIND USED ON MOTOR CARS (INCLUDING STATION WAGONS AND RACING CARS)	\$3,360	1	NO	\$3,360	\$42.81	78	March
NEW RADIAL TIRES, OF RUBBER, NOT HAVING A HERRING-BONE OR SIMILAR TREAD, NESOI	\$119,423	20	NO	\$5,971	\$188.15	32	August

More expensive than a car!

Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 38

## 1996-2005 Ghana's Capital Outflow to the U.S.

**GHANA** Trade with the U.S. (US \$ million) [Quartile Price Filters]

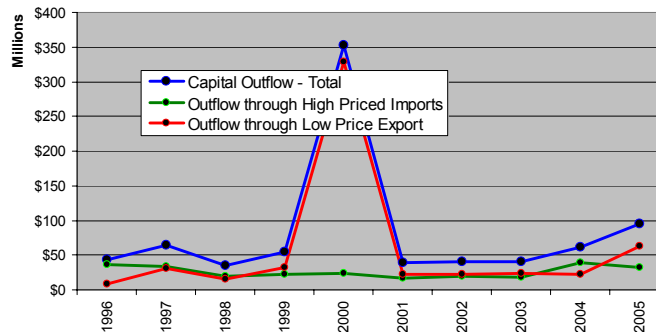
YEAR	Import from the U.S.	Export to U.S.	Overvalued Import (deviation from Upper Quartile Prices)	Undervalued Export (Deviation from Lower Quartile Prices)	Capital Outflow	% of Trade Volume
1996	\$295	\$171	\$36	\$8	\$44	9.4%
1997	\$314	\$154	\$34	\$31	\$65	13.8%
1998	\$223	\$144	\$19	\$16	\$35	15.6%
1999	\$235	\$209	\$22	\$33	\$54	12.2%
2000	\$191	\$205	\$24	\$328	\$352	89.1%
2001	\$200	\$187	\$17	\$22	\$40	10.3%
2002	\$193	\$116	\$19	\$22	\$41	13.3%
2003	\$209	\$82	\$17	\$24	\$41	14.1%
2004	\$306	\$145	\$39	\$23	\$62	13.7%
2005	\$338	\$158	\$33	\$62	\$95	19.2%
<b>Total</b>	<b>\$2,505</b>	<b>\$1,572</b>	<b>\$261</b>	<b>\$568</b>	<b>\$830</b>	<b>20.3%</b>

Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 39

## Annual Capital Outflows (\$)

from Ghana to the U.S. 1996 - 2005

Capital outflows from Ghana to the U.S.:  
 (i) Doubled between 2003 and 2005;  
 (ii) 2000 is an abnormal year



Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 40

## What happened in 2000 Ghana's Export?

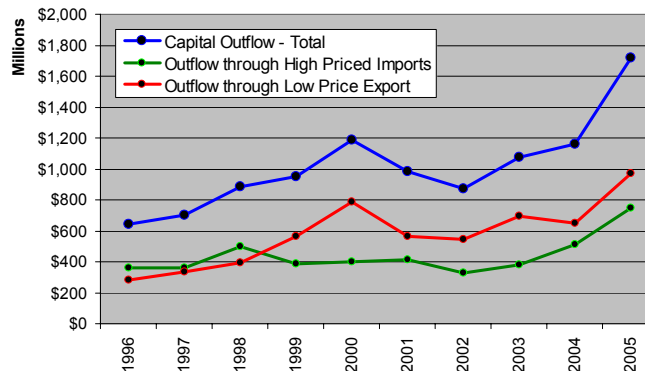
- Ghana Exported Diamonds to the U.S. through New York during February 2002 (air cargo), 37 times
  - Item: Diamonds except industrial, unworked or simply sawn, cleaved or bruted (HS 10 Code: 7102310000)
  - Weight: 664,680 Carat (=132.94KG, 1 ct=0.2 gram)
  - Value: \$10,723,165
  - Shipping weight via air: 37 KG - less than the diamond weight
- Price \$16.13/carat ( $\leftarrow$  \$10,723,165/ 664,680 ct)
  - US - World Lower Quartile Price in 2000: **\$485.14/ct**
  - Undervalued amount =  $(485.14 - 16.13) * 664680 =$  **\$311 million**
- If we assume Shipping weight 37 kg (= 185,000 CT) is the correct weight  $\rightarrow$  Price= \$57.96/carat
  - Then the undervalued amount = **\$79 million**

*Capital Movements from Africa to the U.S. through Trade Mispricing; University of Essex, 6-7 July 2006... 41*

## Annual Capital Outflows (\$)

from South Africa to the U.S. 1996 - 2005

Capital outflows from South Africa to the U.S.: (i) more than doubled in 10 years; (ii) more through low priced export than through high priced imports since 1999.

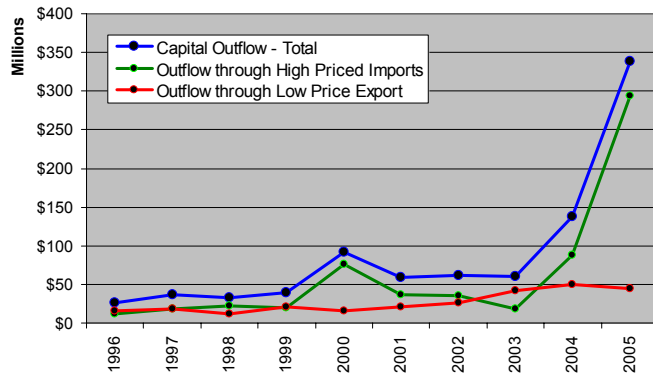


*Capital Movements from Africa to the U.S. through Trade Mispricing; University of Essex, 6-7 July 2006... 42*

## Annual Capital Outflows (\$)

### from Kenya to the U.S. 1996 - 2005

Capital outflows from Kenya to the U.S.: (i) Primarily through high priced imports since 2000; (ii) Rapid growth during the last two years

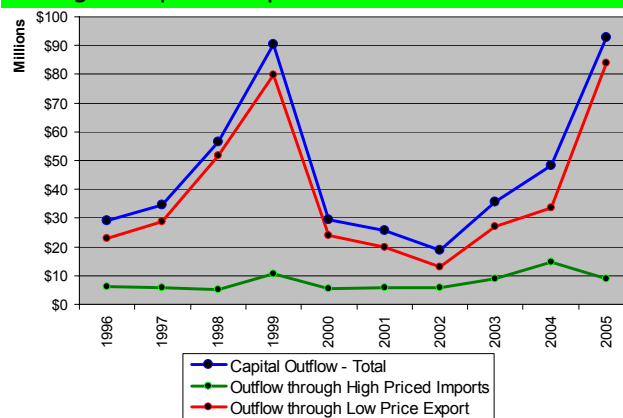


July 2006... 43

## Annual Capital Outflows (\$)

### from Gabon to the U.S. 1996 - 2005

Capital outflows from Gabon to the U.S.: Primarily through low priced export



Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 44

## Annual Capital Outflows from Africa to the U.S. 1996 - 2005

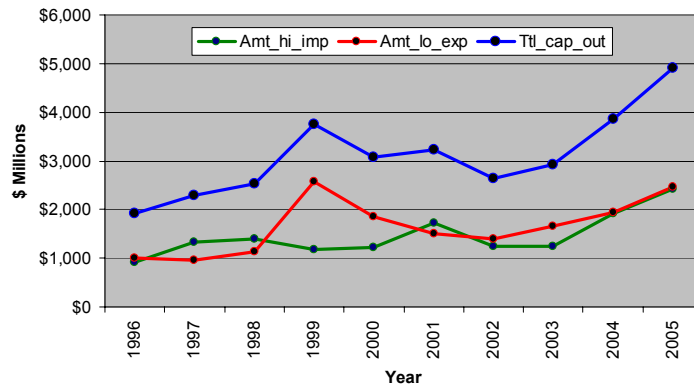
Capital Outflows from All Countries in Africa to the U.S., 1996 - 2005

year	Capital Outflow from Africa to the U.S (\$ million)			Capital Outflow from Africa to the U.S (% of trade value)		
	Through high priced imports from the U.S.	Through low priced exports to the U.S.	Total	Outflow through high priced imports as % of African import value	Outflow through low priced exports as % of African export value	Total Outflow through trade as % of African trade volume (import & export)
1996	\$906	\$1,004	\$1,910	8.5%	5.5%	6.6%
1997	\$1,332	\$950	\$2,282	11.7%	4.8%	7.3%
1998	\$1,388	\$1,138	\$2,526	12.4%	7.2%	9.4%
1999	\$1,187	\$2,575	\$3,762	12.0%	15.2%	14.0%
2000	\$1,228	\$1,845	\$3,073	11.2%	6.7%	8.0%
2001	\$1,722	\$1,504	\$3,226	13.9%	5.9%	8.5%
2002	\$1,238	\$1,394	\$2,632	11.6%	6.3%	8.0%
2003	\$1,246	\$1,667	\$2,914	11.7%	5.2%	6.8%
2004	\$1,913	\$1,939	\$3,852	14.2%	4.2%	6.5%
2005	\$2,432	\$2,471	\$4,903	15.7%	3.8%	6.1%
<b>TOTAL</b>	<b>\$14,592</b>	<b>\$16,488</b>	<b>\$31,080</b>	<b>12.5%</b>	<b>5.7%</b>	<b>7.7%</b>

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 45*

## Annual Capital Outflows (\$) from Africa to the U.S. 1996 - 2005

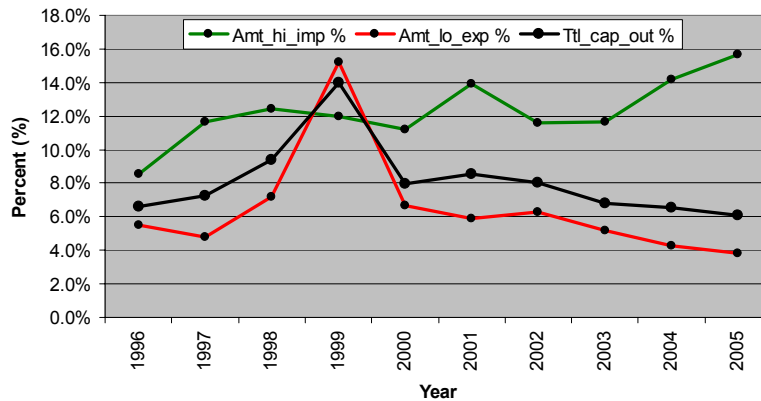
Between 1996 and 2005, Capital outflows more than doubled – both through low priced export and high priced import



*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 46*

## Annual Capital Outflows (%) from Africa to the U.S. 1996 - 2005

In 2005, Capital outflows through low priced export as a fraction of the export value (3.8%) is much smaller than the capital outflows through high priced import as a fraction of the import value ( 15.7%)



*Capital Movements from Africa to the U.S. through Trade Mispricing; University of Essex, 6-7 July 2006... 47*

## Capital Outflows from Top 30 African Countries to the U.S. through Trade, 2000-2005

	Through high priced imports from the U.S.	Through low priced exports to the U.S.	Total	Outflow through high priced import as % of African import value	Outflow through low priced export as % of African export value
<b>TOTAL for All African Countries (2000-5)</b>	<b>\$9,778,518,053</b>	<b>\$10,821,348,848</b>	<b>\$20,599,800,454</b>	13.3%	5.0%
<b>TOTAL for Top 30 African Countries (2000-5)</b>	<b>\$9,399,492,538</b>	<b>\$10,743,227,649</b>	<b>\$20,142,720,187</b>	13.4%	5.0%
South Africa	\$2,788,366,139	\$4,211,092,515	\$6,999,458,654	15.1%	14.5%
Egypt *	\$2,318,648,934	\$1,254,390,482	\$3,573,039,416	12.3%	16.3%
Algeria *	\$910,811,102	\$813,147,163	\$1,723,958,266	16.5%	2.7%
Nigeria	\$812,066,366	\$439,654,186	\$1,251,720,551	11.7%	0.6%
Morocco *	\$253,793,063	\$925,469,582	\$1,179,262,645	8.8%	35.4%
Kenya	\$548,475,282	\$198,721,316	\$747,196,598	23.7%	14.4%
Angola	\$270,048,750	\$365,753,800	\$635,802,550	9.3%	1.4%
Ghana	\$150,007,720	\$481,331,421	\$631,339,141	10.4%	53.9%
Equatorial Guinea	\$217,558,614	\$264,048,076	\$481,606,690	20.1%	5.6%
Tunisia *	\$120,969,670	\$137,212,938	\$258,182,608	8.3%	16.2%
Gabon	\$49,640,819	\$201,578,721	\$251,219,540	10.8%	1.6%
Botswana	\$27,285,368	\$195,864,855	\$223,150,223	10.8%	55.0%
Lesotho	\$3,716,159	\$216,882,035	\$220,598,194	20.3%	11.2%
Chad	\$105,972,150	\$97,204,886	\$203,177,035	24.4%	4.2%
Ethiopia	\$165,382,709	\$13,547,409	\$178,940,118	9.9%	6.2%
Madagascar	\$20,899,595	\$154,801,882	\$175,701,477	12.9%	8.5%

*Capital Movements from Africa to the U.S. through Trade Mispricing; University of Essex, 6-7 July 2006... 48*

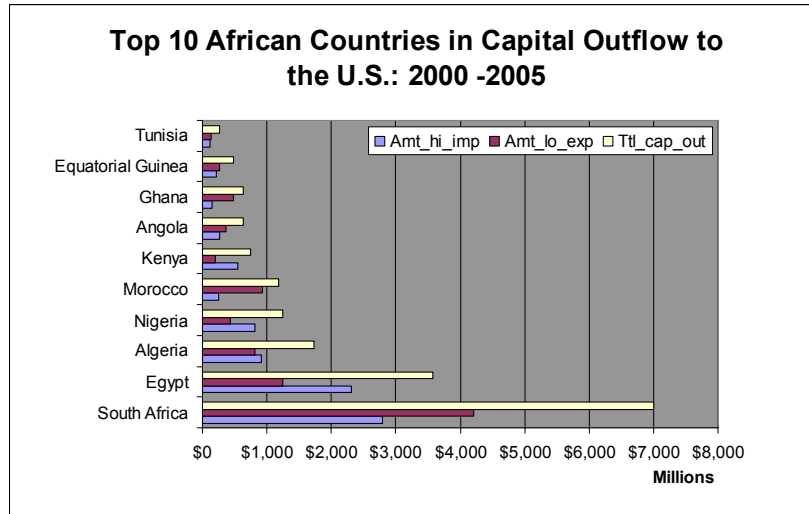


## Capital Outflows from Top 30 African Countries to the U.S. through Trade, 2000-2005

	Through high priced imports from the U.S.	Through low priced exports to the U.S.	Total	Outflow through high priced import as % of African import value	Outflow through low priced export as % of African export value
<b>TOTAL for All African Countries (2000-5)</b>	<b>\$9,778,518,053</b>	<b>\$10,821,348,848</b>	<b>\$20,599,800,454</b>	13.3%	5.0%
<b>TOTAL for Top 30 African Countries (2000-5)</b>	<b>\$9,399,492,538</b>	<b>\$10,743,227,649</b>	<b>\$20,142,720,187</b>	13.4%	5.0%
Swaziland	\$20,890,580	\$144,670,318	\$165,560,898	17.0%	18.3%
Ivory Coast	\$75,000,449	\$83,947,936	\$158,948,385	12.2%	2.4%
Cameroun	\$83,122,812	\$52,174,004	\$135,296,816	11.8%	4.7%
Namibia	\$21,770,352	\$104,909,543	\$126,679,895	3.6%	16.7%
Congo (Brazzaville)	\$62,226,912	\$61,889,101	\$124,116,014	13.2%	1.5%
Mauritius	\$36,885,844	\$80,235,251	\$117,121,095	21.4%	4.9%
Senegal	\$101,943,750	\$11,760,197	\$113,703,947	17.3%	9.6%
Tanzania	\$56,408,478	\$45,844,788	\$102,253,266	12.2%	27.2%
Malawi	\$12,441,238	\$60,342,795	\$72,784,033	10.0%	13.2%
Congo (Kinshasa)	\$23,498,197	\$46,846,543	\$70,344,741	10.7%	4.2%
Guinea	\$55,416,383	\$10,172,587	\$65,588,970	12.9%	2.2%
Zimbabwe	\$29,418,663	\$27,825,299	\$57,243,962	11.0%	5.2%
Liberia	\$25,460,004	\$24,824,971	\$50,284,976	9.2%	6.7%
Uganda	\$31,356,437	\$17,083,047	\$48,439,484	12.5%	11.5%

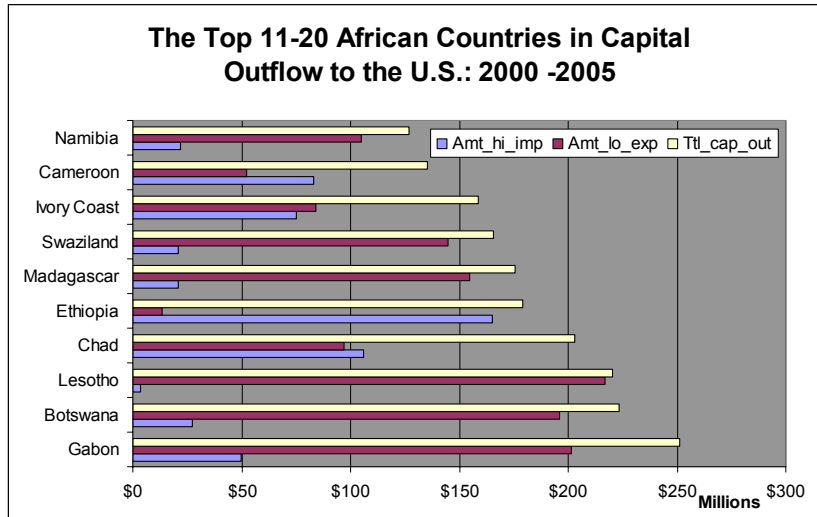
*Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 49*

**South Africa, Morocco, Angola, Ghana, Equatorial Guinea, Tunisia: Larger Capital outflows through low priced exports since 2000.**



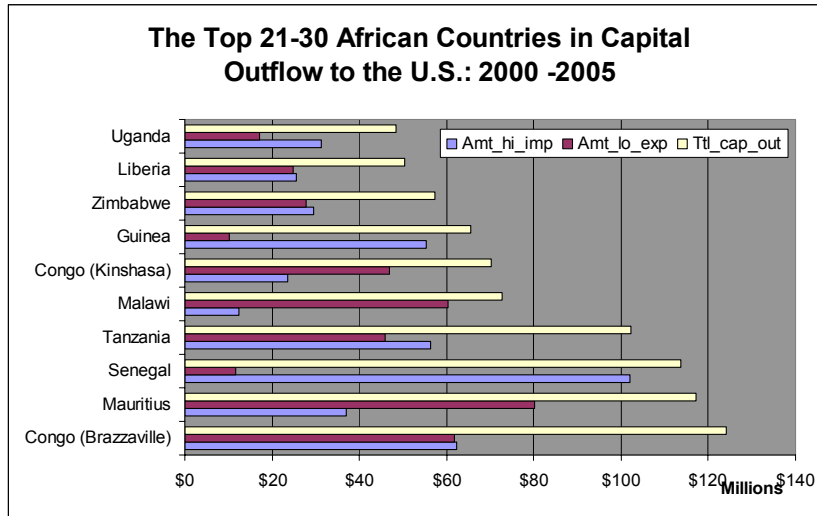
*Capital Movements from Africa to the U.S. through Trade Mispricing: University of Essex, 6-7 July 2006... 50*

Gabon, Botswana, Lesotho, Madagascar, Swaziland, Ivory Coast, Namibia: Larger Capital outflows through low priced exports since 2000.



Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 51

Mauritius, Malawi, Congo (Kinshasa) : Larger Capital outflows through low priced exports since 2000.



Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 52

## CONCLUSION

- **Tightening Financial Regulations alone is not sufficient in reducing Capital Outflow**
  - Minimizing Capital outflow through Import/Export Mispricing requires systematic inspections and audits of export & import
- **Price Filter Matrix**
  - Can Be Built For Each HS Code & Country Combination
  - May Be Highly Effective In Auditing Suspicious Individual Importers And Exporters
  - Can Be Used To Estimate The Amount Of Over- And Under-Invoicing In Export/Import Transactions
  - Can Be Used for Real-time Inspection Of Cargo
    - Prevention Of Money Laundering, Duty Fraud, Income Tax Evasion, Capital Flight
    - Need for Import/Export database for other Countries in addition to the U.S.

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 53*

## CONCLUSION

- **Annual Capital Outflows from Africa to the U.S.**
  - Between 1996 and 2005, Capital outflows from Africa to the U.S. more than doubled – both through low priced export and high priced import - from \$1.9 billion in 1996 to \$4.9 billion in 2005/
  - In 2005, capital outflows through low priced export as a fraction of the export value (3.8%) is much smaller than the capital outflows through high priced import as a fraction of the import value ( 15.7%)

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 54*

## CONCLUSION

- Annual Capital Outflows from sample African countries to the U.S. 1996 - 2005
  - Capital outflows from Gabon to the U.S.: Primarily through low priced export
  - Capital outflows from Kenya to the U.S.
    - Primarily through high priced imports since 2000
    - Rapid growth during the last two years
  - Capital outflows from Nigeria to the U.S. : (i) tripled between 1996 and 2005; (ii) been primarily through high priced imports since 1991
  - Capital outflows from South Africa to the U.S.: (i) more than doubled between 1996 and 2005; (ii) more through low priced export than through high priced imports since 1999.

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 55*

## CONCLUSION

- More than half of the top 30 African countries in capital outflow during 2000-2005 have a larger capital movement from low priced exports during 2000-06 than from high priced imports
  - South Africa, Morocco, Angola, Ghana, Equitorial Guinea, Tunisia
  - Gabon, Botswana, Lesotho, Madagascar, Swaziland, Ivory Coast, Namibia
  - Mauritius, Malawi, Congo (Kinshasa)

*Capital Movements from Africa to the U.S through Trade Mispricing: University of Essex, 6-7 July 2006... 56*