



Estimating and assessing the impact of IFF in the  
diamond and platinum mining sectors (Botswana,  
Namibia, South Africa, Zimbabwe)

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19<sup>th</sup> June, 2018

Regional Conference on "Corruption and the  
Challenge of Economic Transformation in  
Southern Africa"

Gaborone, Botswana

*\*Sponsored by TrustAfrica and OSISA\**



# Agenda



- Illicit Financial Flows
- Background & Literature
- Measurement
- Data & Measurement outcomes
- Brief Empirical Analysis & Results
- Conclusion & Remarks



# Introduction

- IFF out of SSA is large (Kar & Cartwright, 2011)
- In the IFF literature, there are three main categories namely:
  - 1.) IFF that emanates from corruption, in the form of embezzlement, and bribery by official in government;
  - 2.) IFF that emanates from laundering of money from different form of illegal activities;
  - 3.) IFF that emanates from tax evasion and attempts by firms to move money between borders

# Introduction

- ▶ Natural resource wealth is often linked with outflow of capital (Cerra et al, 2008; Letete, 2015)
  - ▶ Countries with high levels of capital flight are often rich in natural resources
  - ▶ Exploring the mining sector (Platinum and Diamond) is thus befitting
- ▶ Several measures estimate IFF & capital flight at the macro-level
  - ▶ **Measuring IFF at the industry/sector/product level is the next iteration in IFF analysis**
  - ▶ **Is there a significant relationship with macroeconomic variables?**

# Background & Measurement

- Illicit financial flows (& Capital flight)
  - Fedderke et al., 2002; Boyce and Ndikumana, 2001; Le and Zak, 2006; Kar and Cartwright, 2011; Mevel, 2015.
- Measuring IFF - **Trade-misinvoicing**, via *balance of payment errors, direct/indirect approach*
  - Fedderke & Liu 2001; Hummels & Lugovskyy, 2006; Mevel 2015; UNECA, 2015
  - **UN COMTRADE (United Nations Commodity Trade)**
  - CEPII (Centre d'Etudes Prospectives et d'Informations Internationales)
  - BACI
  - **IMF DOTS (International Monetary Fund Direction of Trade Statistics)**

# Measuring IFF

## ➤ UN COMTRADE

- 5000 products for 200 countries
- It reports bilateral trade stats at the product level, up to the 6<sup>th</sup> trade digit.
- Three different measures considered:
  - 1.) *Quantity Unit,*
  - 2.) *Net weight in Kilograms, and*
  - 3.) *trade value in US\$.*
- We made use of the 2<sup>nd</sup> and 3<sup>rd</sup> measure, to avoid measurement hurdles.



# Measuring IFF (Diamond & Platinum)

**UN COMTRADE** - It reports bilateral trade stats up to the 6<sup>th</sup> digit product level, we use the 4<sup>th</sup> level.

- ▶ At the 6-digit level, both products are often mixed with other products in the form of coating and jewelry mixes.
- ▶ Two commodity codes were identified to capture diamond and platinum respectively: 7102 & 7110.
  - ▶ 7102: – “Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitation jewelry; coin // Diamonds, whether or not worked, but not mounted or set.”; and
  - ▶ 7110: - “Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitation jewelry; coin // Platinum, unwrought or in semi-manufactured forms, or in powder form.”

# Measuring IFF (Diamond & Platinum)

Extracting potential IFF.

- ▶ UN COMTRADE alone isn't enough
  - ▶ CIF and FOB
  - ▶ USGS (U.S Geological Survey)?
  - ▶ World Bank
- ▶ World bank Platinum prices
- ▶ USGS diamond prices
- ▶ UN COMTRADE reported weights

\*all give the total computed value of trade, with the difference between reported imports (from RSA by reporting country), and reported exports (by RSA to its exporting partners)\*

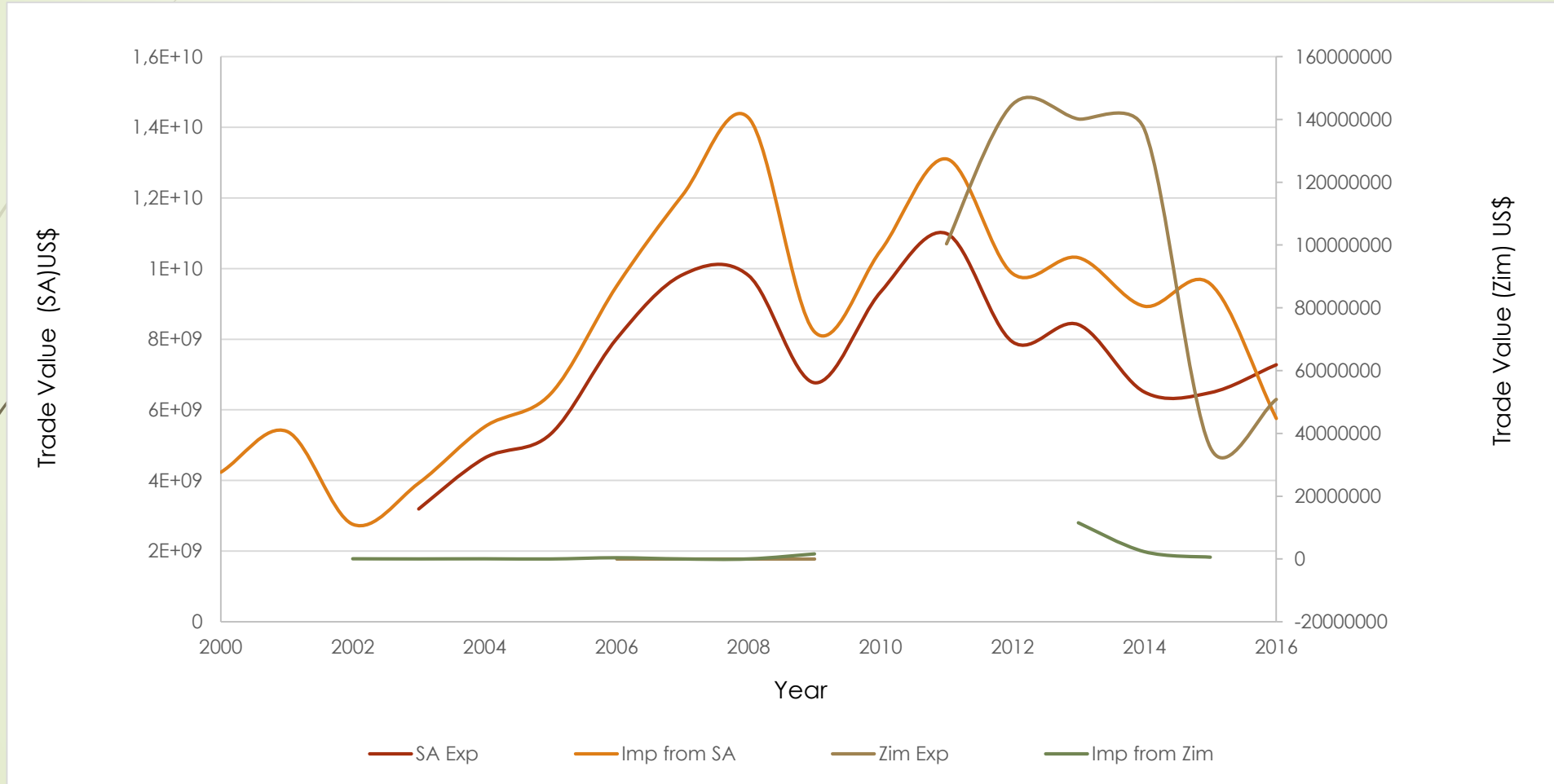


# Measuring IFF (Diamond & Platinum)

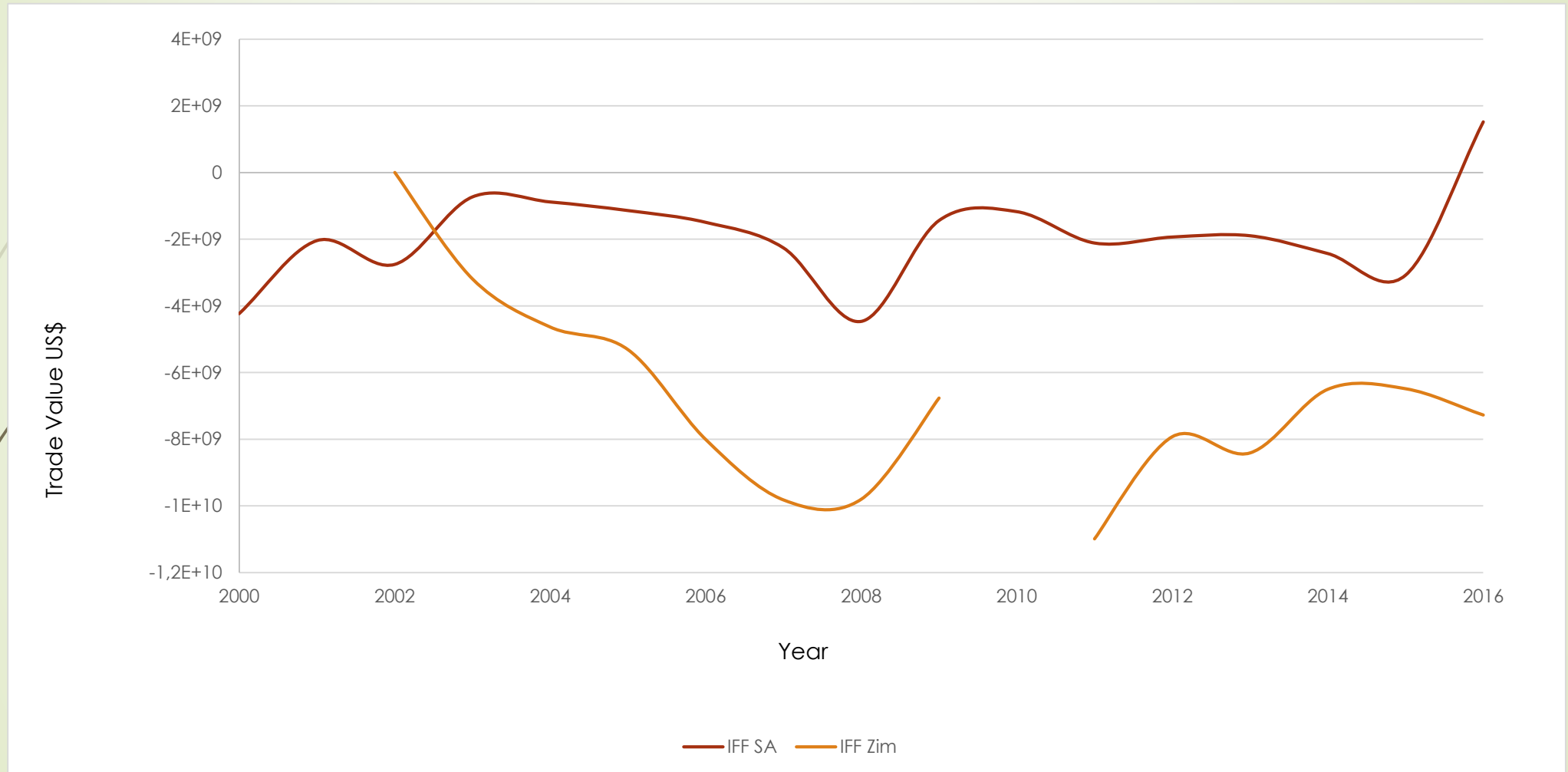
Extracting potential IFF.

- ▶ Calculation
- ▶ Trade value (unadjusted IFF) = Sum of all RSA (Botswana, Namibia, Zimbabwe) reported exports to trade partners (in trade value \$) – Sum of reported imports by trade partners from RSA (Botswana, Namibia, Zimbabwe) (in trade value \$)
  - ▶ This isn't adjusted for CIF or FOB
  - ▶ Difficulties obtaining values for CIF and FOB that can be aggregated across industries in each country
- ▶ Use weights instead: Computed IFF = (Sum of all RSA (Botswana, Namibia, Zimbabwe) reported exports to trade partners (in kilograms) \* Price) – ((Sum of reported imports by trade partners from RSA (Botswana, Namibia, Zimbabwe) (in kilograms) \* Price)

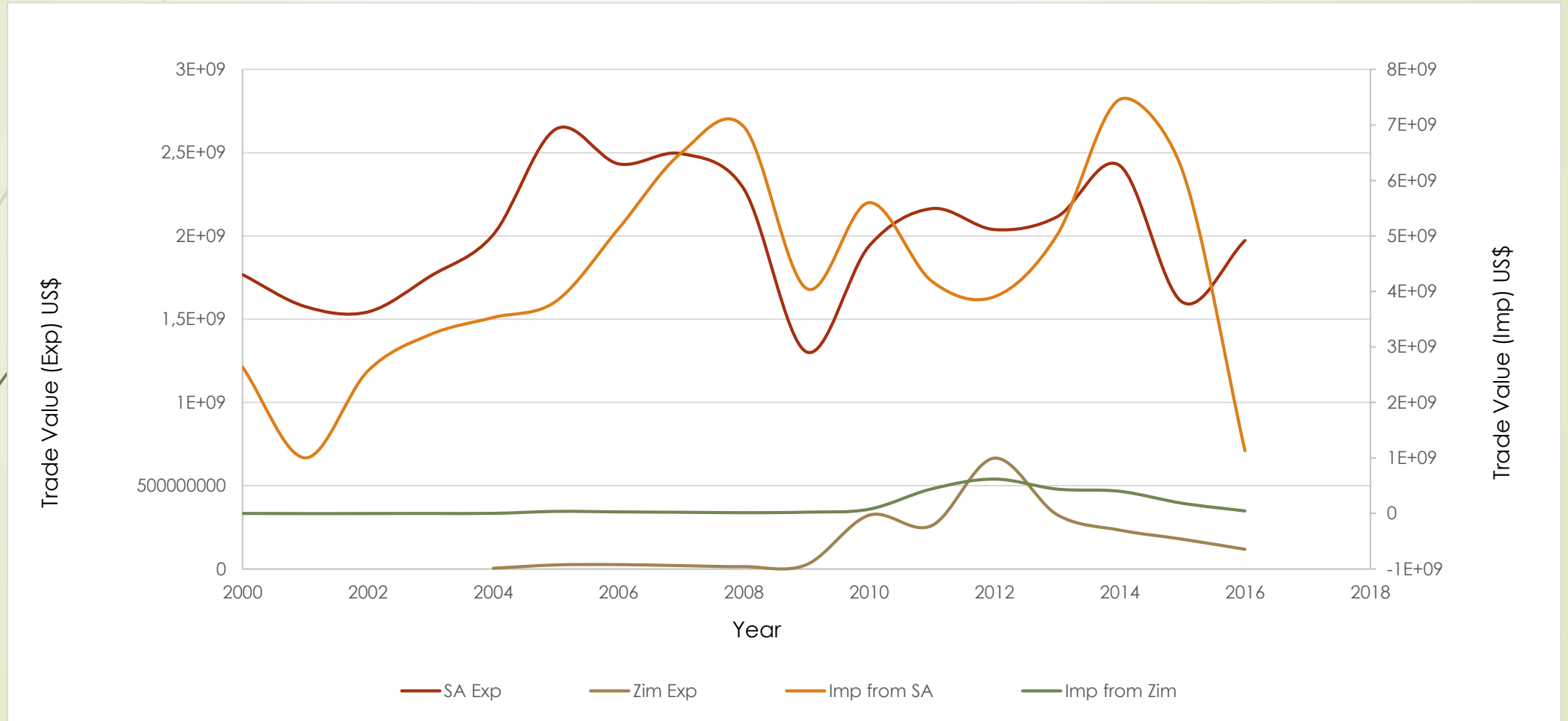
# Platinum Exports and reported Imports from trading partners, 2000-2016.



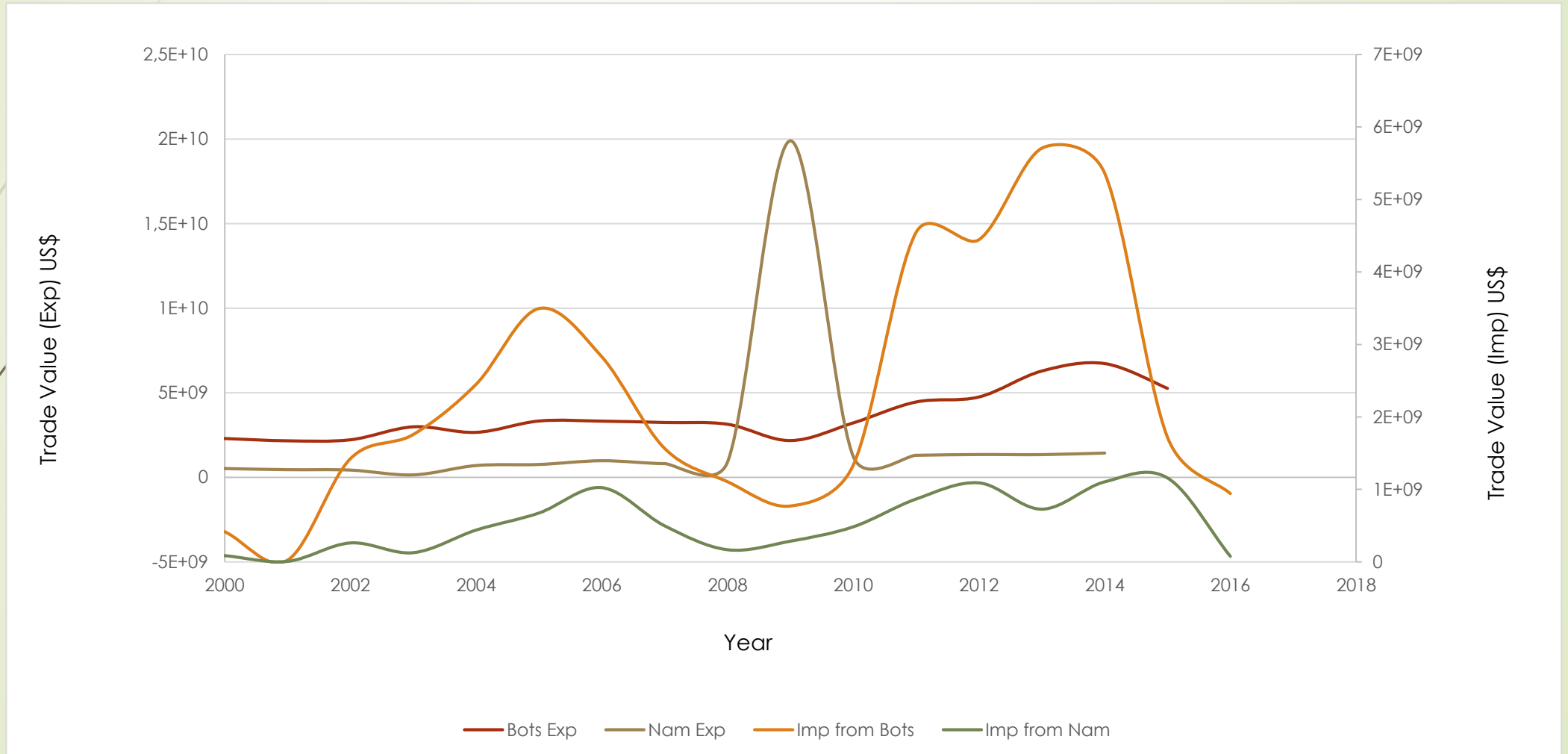
# Unadjusted IFF within the Platinum commodity market, 2000-2016



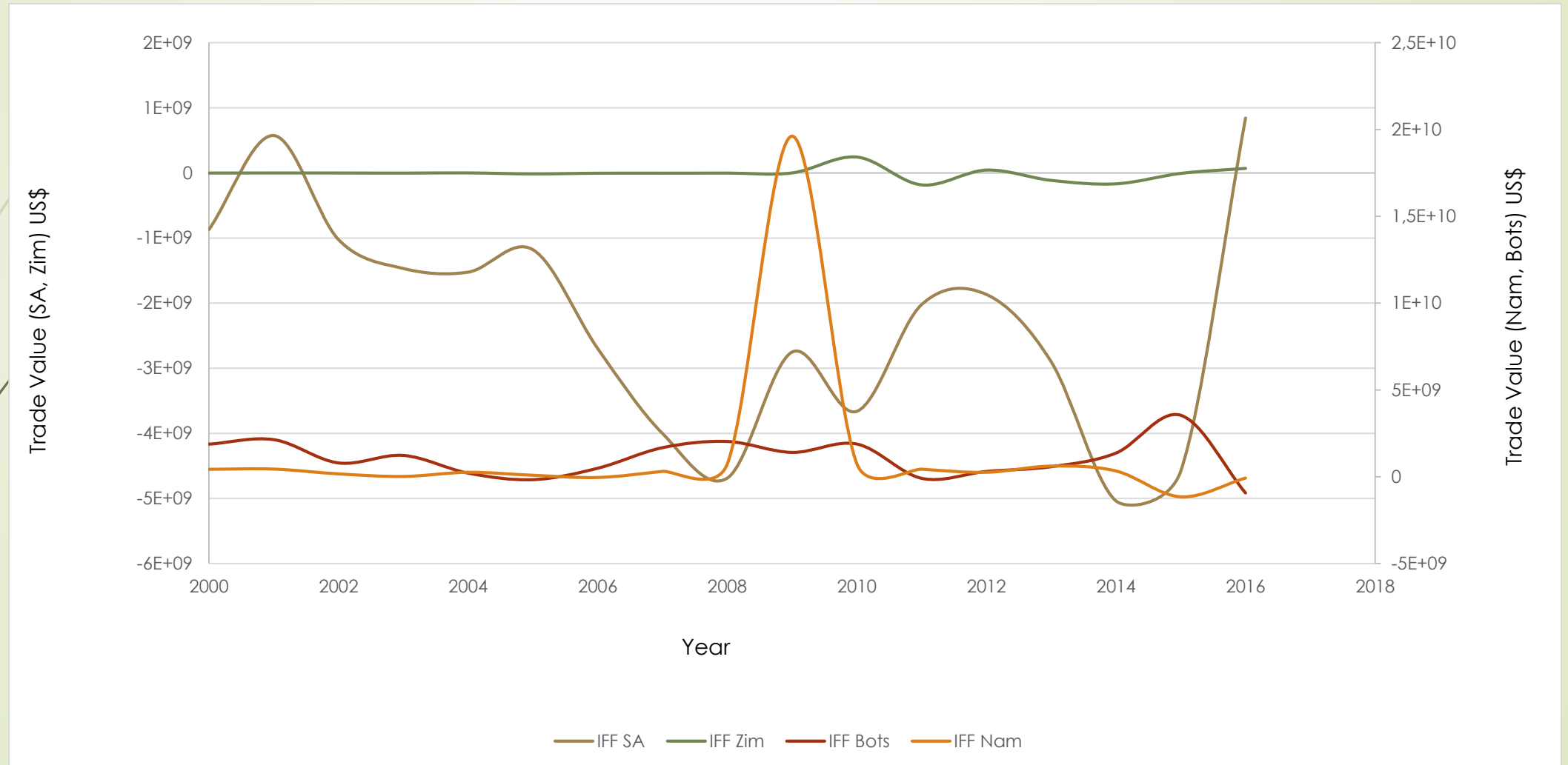
# Diamond exports and reported Imports from partners for South Africa & Zimbabwe, 2000-2016.



# Diamond Exports and reported Imports from partners for Botswana & Namibia, 2000-2016. Source: Various



# Unadjusted IFF within the Diamond commodity market, 2000-2016.





# IFF Overall (Diamonds)? 2000-2015

<b>Difference/total IFF 2000-2015</b>			
<b>Country</b>	<b>Netweight (kg)</b>	<b>Trade Value (US\$ billions)</b>	<b>Computed IFF (US\$ billions)</b>
Botswana	12035	17.2	0.364
Namibia	30476	5.2	1
South Africa	-9972464	-38.8	-55.5
Zimbabwe	85204	-0.16	5.5

# Empirical Analysis and Results

- Exploring Welfare Effects of IFF.
- Two relationships:

$$W_t = \alpha_0 + \alpha_1 IFF_t + \beta Z_t$$

$$IFF_t = \gamma_0 + \gamma_1 X_t + \partial Z_t$$

- Make use of 2SLS estimation technique.
- Welfare: unemployment, political instability
- Control: trade, mineral rents, natural resource rents, gross capital formation, GDP growth, diamond prices, platinum prices, total platinum production, and total diamond production.

# Empirical Analysis and Results

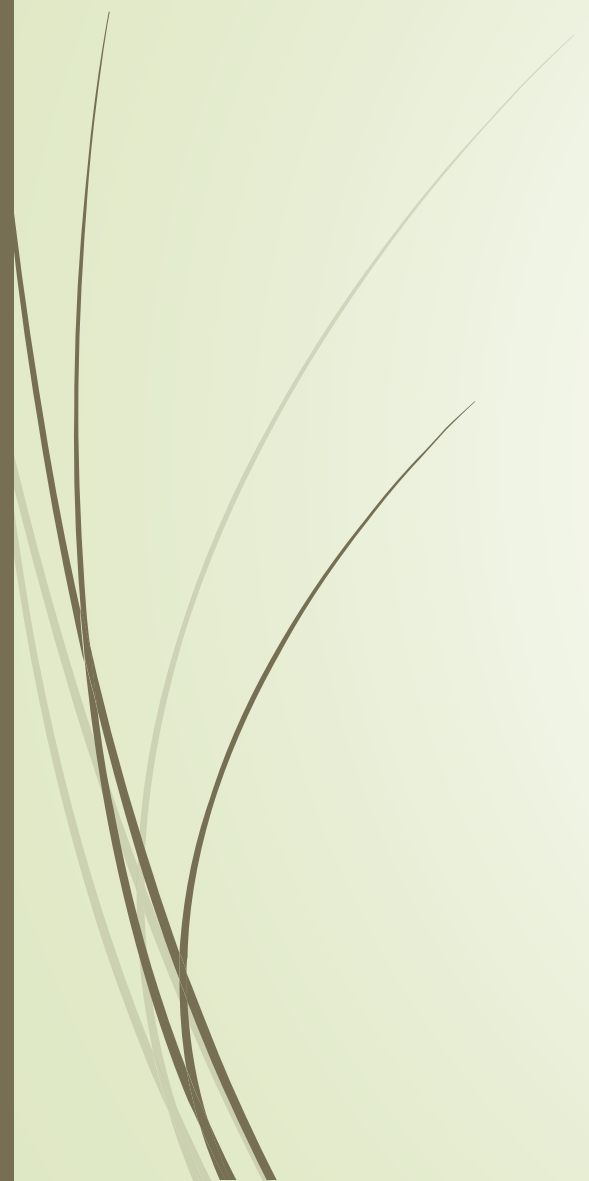
## ➤ Diamond IFF (in net weight) and Employment in the Namibia Mining





# Conclusion and Disclaimer

- The numbers are alarming
  - There might be an overestimation
  - Due to the lack of FOB and CIF estimates for each country.
  - The accuracy of weights used is not known,
    - First time in literature.
  - However overestimated it may be, the estimates shouldn't be far off from the reality
  - More detailed calculations at the monthly level,
    - Adjusting for time overlaps.
- No evidence suggesting negative significant impact (if anything, some pointing towards positive) between IFF and unemployment, political instability (Diamonds & Platinum)



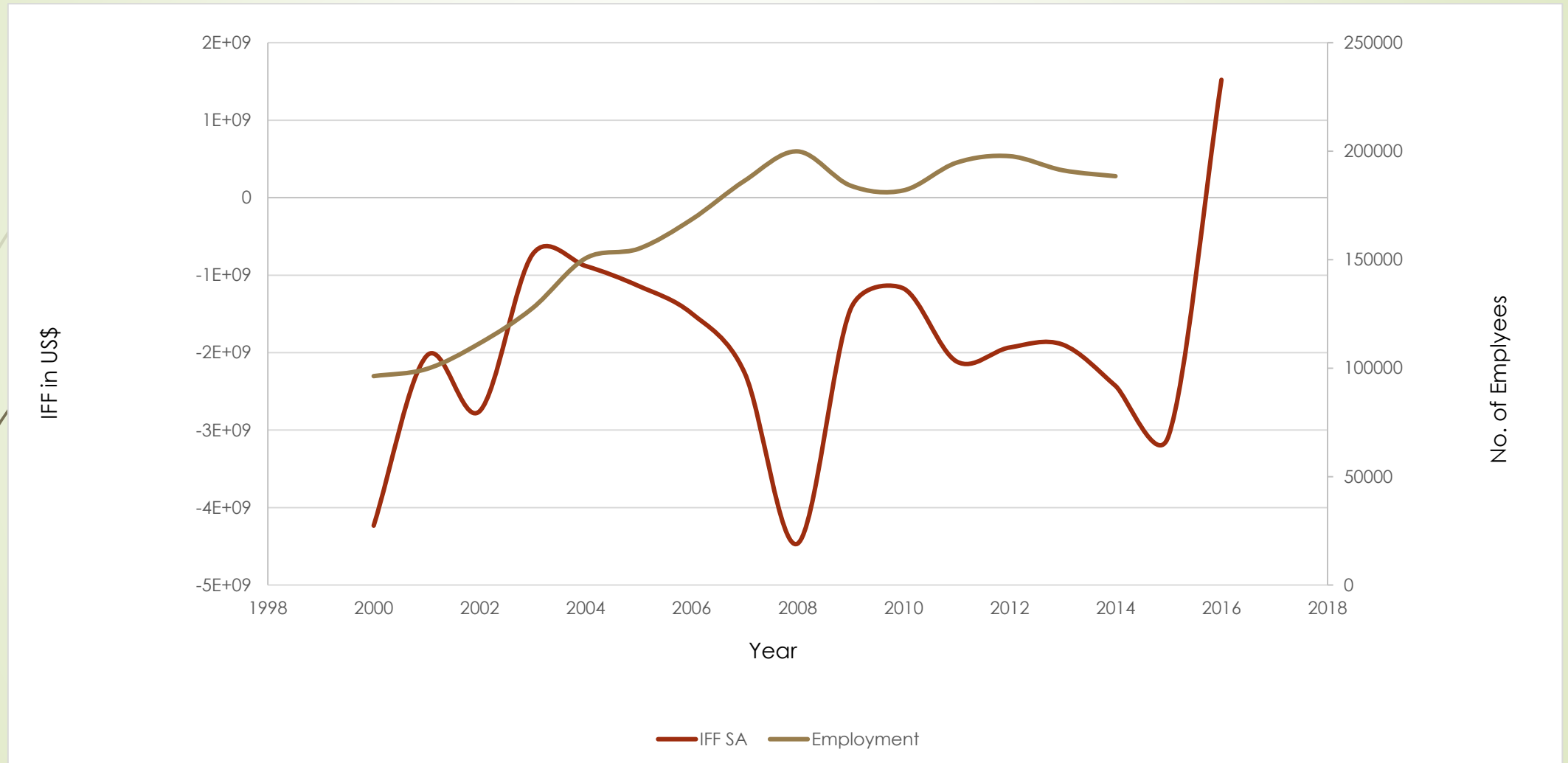
Thank You. 😊



## IFF Overall (Platinum)? 2000-2015

<b>Difference/total IFF 2000-2015</b>			
<b>Country</b>	<b>Netweight (kg)</b>	<b>Trade Value (US\$ billions)</b>	<b>Computed IFF (US\$ billions)</b>
Botswana	2570	0.009	0.046
Namibia	-155	-0.001	-0.007
South Africa	14.7 million	-34.0	241.9
Zimbabwe	256 million	0.5	12186.4

# Plot of IFF value in US\$ from the platinum mining in SA, and No. of employees





# Impact of IFF from platinum commodity market on employment in the mining sector

Variable	Model 1	Model 2	Model 3	Model 4
Platinum Quantity	0.0008	-0.0002		
	0.8949	0.8917		
Platinum Weight				
Platinum IFF value			0.0000	0.0000
			0.9108	0.7591
Platinum IFF Value (computed)				
Platinum output	0.4452	0.2873	0.1288	0.0405
	0.7139	0.4636	0.6836	0.9393
Platinum Prices	0.0007	0.0005	0.0004	0.0002
	0.5467	0.1129	0.1111	0.5991
Cross-Section Effects	None	Fixed	None	Fixed
Obs	17	17	17	17

