

# **Capital Flight, Natural Resources and Institutions in Zimbabwe**

**By**

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**To be Presented at the**

**Centre for the Study of African Economies (CSAE) Conference 2015, Oxford, UK**

**on**

**Economic Development in Africa**

## **Abstract**

This study investigates the link between capital flight, natural resources and institutions in Zimbabwe. It also explores mechanism of capital flight by estimating trade misinvoicing. Econometric estimation results show that the higher the macroeconomic instability the higher the capital flight. This implies that government should ensure macroeconomic stability by introducing policies which reduce inflation and exchange rate volatility to curb capital flight. The results show a positive relationship between capital flight and natural resources rents implying higher capital flight is a derivative of high natural resources rents. This implies that the government should introduce proper policies that are transparent and that do not scarce away continuous investment in natural resources. Lastly, institutions have a negative relationship with capital flight, as theoretically expected. It implies that government should increase the effectiveness of institutions to reduce capital flight.

## **Keywords:**

Capital flight, institutions, natural resources, trade misinvoicing, Zimbabwe.

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## 1. INTRODUCTION

The importance of natural resource for economic development is a contentious issue. Some describe natural resources as a blessing (Haber and Menaldo, 2011; Arezki and van der Ploeg, 2007) and others as a curse (Auty, 1993; Sachs and Warner, , 2001). In this context there is controversy regarding the relationship between natural resources and capital flight. This paper therefore investigates the controversial relationship between natural resources particularly mineral resources and capital flight, taking into account the institutional landscape of Zimbabwe. The study first examines the evolution of mining policies and changes in the mineral ownership structure in Zimbabwe. The second component, it explores the contribution of mineral trade misinvoicing to capital flight in Zimbabwe. The study estimates trade misinvoicing of main minerals in Zimbabwe with its major trading partners namely South Africa, China, United Kingdom, and the United States of America (see Saungweme, 2013). The third component investigates the relationship between capital flight, natural resources and the institutional environment, paying attention to macroeconomic episodes in Zimbabwe. In light of this objective the study uses institutional indices constructed by Gwenhamo, Fedderke & de Kadt (2008) to explore the link between the institutional environment, mineral exploitation and capital flight in Zimbabwe. The overarching objective of the work is to highlight country peculiarities with regard to capital flight, institutional quality (governance) and natural resource endowment in the context of macroeconomic crisis.

The study is motivated by the fact that Zimbabwe has experienced massive capital flight which however has not been studied in relation to natural resource endowment, the institutional environment and macroeconomic episodes. For example, Boyce & Ndikumana (2012) find that capital flight in Zimbabwe reached a record high of US\$3.1 billion in 2006. Evidence from the African Development Bank and Global Financial Integrity (2013) also shows that Zimbabwe has lost a cumulative US\$12 billion in the last three decades through illicit financial flows ranging from secret financial deals, tax avoidance and illegal commercial activities. Furthermore, according to the Minerals Marketing Corporation of Zimbabwe (2014) the country is losing more than \$50 million worth of gold every month through smuggling.

There is little detailed analysis on the links between capital flight misinvoicing of trade across countries and across main mineral products, and the role of changes in mining ownership structures and policies. The only study that documents trade misinvoicing, however limited to the United States is by De Boyrie, Nelson & Pak (2007) who find evidence of trade misinvoicing in Zimbabwe through high priced imports from the United States of about US\$ 29 million and through low priced exports to the United States of about US\$28 million between 2000 and 2005. What is lacking from this study is therefore the tracking of trade misinvoicing of each of the main minerals<sup>4</sup> exported by Zimbabwe across major trading partners.

Further, Zimbabwe is an interesting case as it has been characterised by a changing macroeconomic environment which has presented opportunities for capital flight. It has witnessed episodes of stable growth (1980-1998), episodes of state fragility, international isolation, political crisis, negative economic growth, lack of rule of law (1999-2008) and episodes of recovery in economic growth, use of multicurrency, continuing of international isolation and compulsory indigenisation policy (2009-2014). These episodes present an opportunity to explore the influence of local specific factors such as the institutional framework, macroeconomic and natural resources on the evolution of capital flight in Zimbabwe. This study also adds another dimension which has not been studied extensively, which is the econometric investigation of the determinants of capital flight focusing on natural resource endowment and institutional quality. While Makochehanwa (2007) explores the role of macroeconomic factors on capital flight in Zimbabwe, his study however neglects the role of institutional and sector specific factors such as natural resources rents.

Specifically the research questions of the study are:

- How have mining policies and mining ownership structure evolved in Zimbabwe?
- What is the contribution of trade misinvoicing to capital flight in Zimbabwe?
- What is the relationship between capital flight, natural resources, the institutional environment, and the macroeconomic environment in Zimbabwe?

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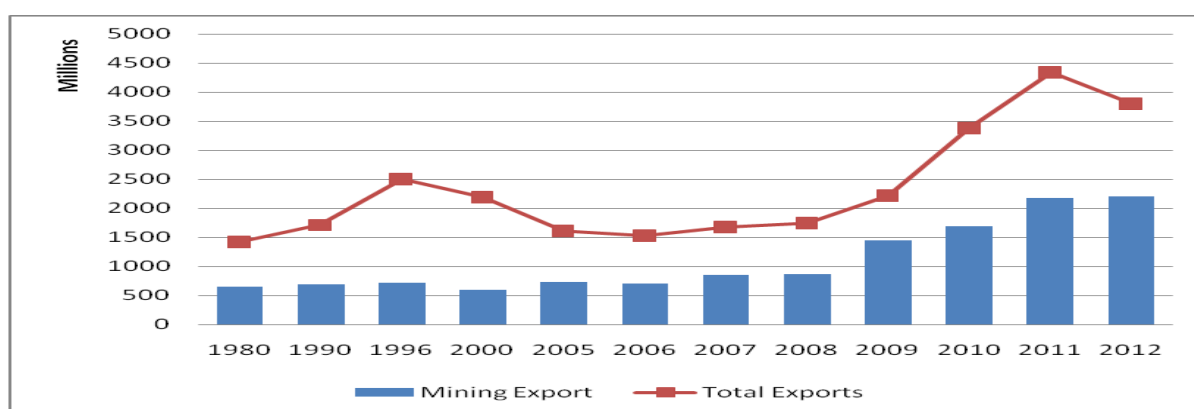
<sup>4</sup> According to ZimTRade (2013) the main minerals exported are gold, diamond, platinum, ferro-chrome alloys, nickel and asbestos

## 2. BACKGROUND

Zimbabwe has abundant mineral resources which have great potential to contribute to economic development. Figure 2 shows that for the period 1980 until 2006, the contribution of mining sector to economic growth has been hovering around 3-4%. This is against the background that Zimbabwe is one of the African countries which is endowed with a diversity of precious minerals and metals. According to Mobbs (2013) in the 2012 Minerals Year Book, (United States Geological Survey), Zimbabwe accounts for about 9% of the world's diamond production, 6% of the world's platinum production and about 4% of the world's palladium output. The report further outlines that Zimbabwe is currently economically exploiting around 30 different types of minerals, the main commodities being diamond, gold, nickel and platinum.

Figure 1 shows that mining is the main determinant of the total exports. Most of the metals and minerals which are mined in Zimbabwe are for the export market. This therefore presents a fertile ground for trade misinvoicing given that most of the companies in the mining sector are foreign owned. Jordan et.al (2012) reveals that foreign ownership is a driver of trade misinvoicing.

**Figure 1: Mineral exports and total exports**



**Source: Zimstats , 2014**

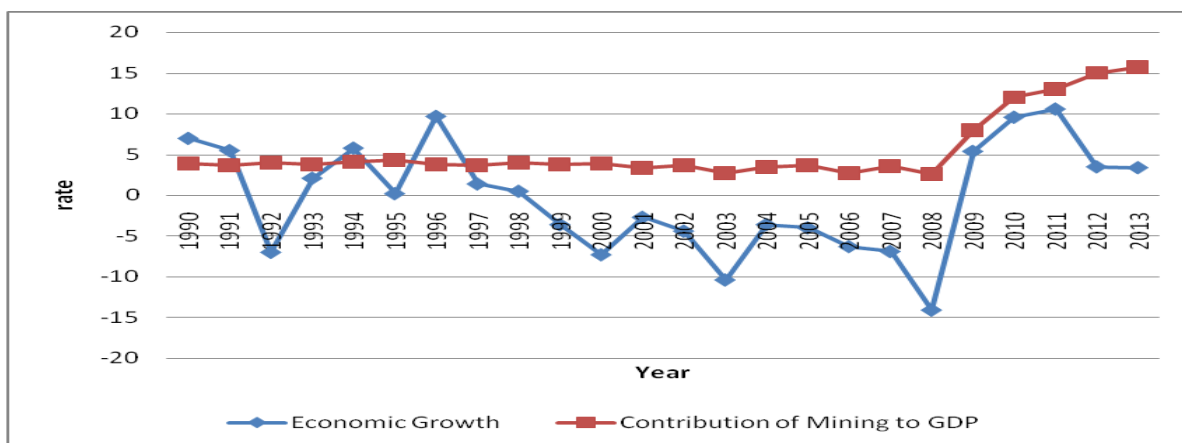
Given that Zimbabwe is endowed with a diversity of minerals, one would assume that the contribution of the mining sector to Gross Domestic Product (GDP) is substantial. However, as Figure 2 shows, since 2000 until 2008, the contribution of the mining sector to GDP has

been hovering between 4 and 3 percent. Figure 2 suggests a weak correlation between the mining sector and economic growth.

### *The Macroeconomic Environment*

Since Zimbabwe's independence in 1980 the macroeconomic environment has gone through various cycles of booms and recessions. During 1980-1990, the economy experienced positive economic growth and stable macroeconomic environment. According to World Bank statistics, Zimbabwe experienced economic growth rate of 14.42%, 6.94%, and 6.99% for the years 1980, 1985 and 1990 respectively. In the second wave from 1990 to 1998, the country continued to experience positive economic growth. However, the growth momentum had slowed. Economic growth was 5.5%, 2.1% and 0.2% for the period 1991, 1993 and 1995 respectively. The period 1999 to 2008 was characterised by cumulative economic decline. Data according to Zimstats (2014) indicates that for the period of 1998 -2008 the gross domestic product declined by about 50.1 percent. The period was characterised by hyperinflation environment and low capacity utilisation. However, since 2009 until 2013 the economy began to experience positive economic growth, with an average of GDP growth rate of 6.5% over that period. The period marked economic recovery, reconstruction and growth, associated with political stability.

**Figure 2: GDP Growth and the contribution of mining sector to GDP**



Source: Ministry of Finance and Economic Development, Zimstats, BMI

### ***Ownership of mining firms***

Foreign companies dominate in most of the mining activities. This is due to the huge capital requirements and technical expertise required in the mining exploration and exploitation. Table A1 in the appendix presents the companies and countries of most of the mining companies with operations in Zimbabwe. South Africa, Canada, Australia and the United Kingdom are the main players in mining activities in Zimbabwe. Besides Mbada Diamonds, non-Zimbabwean companies carry out almost all of the mining operations. This has seen the country introducing policies such as the Community Share Ownership Trust 2011. Matsa (2014) points out that Zimplats was the first company to implement community share ownership trust in October 2011 followed by Unki Mine in November 2011. The purpose of the Community Share Ownership is to redistribute the economic wealth from the mining sector. The Indigenisation and Economic Empowerment Act calls for a 51% local ownership and 49% foreign ownership and seeks to ensure that local people have more stake in the natural resource exploitation. This policy makes local people benefit in contrast to the past practice where foreign companies were the major beneficiaries of the Zimbabwe mineral resources.

### ***Mining policies, ownership structure and illegal mining activities***

Zimbabwe developed two mineral policy documents: the overall mining policy which is still a draft and the Diamond Policy, launched in 2012. The mining policy specifies the paramount roles and responsibilities of the different players involved in the mining value chain. In this regard, the minerals form part of the national assets, which therefore by nature are supposed to assist in the attainment of the national objectives. The Ministry of Mines and Mining Development, Reserve Bank of Zimbabwe, Zimbabwe Mining Development Company (ZMDC) and Minerals Marketing Corporation of Zimbabwe (MMCZ) are the institutions which are involved in the management of mineral resources in Zimbabwe. The basic legislation regulating mining activities in Zimbabwe is the Mines and Minerals Act, [Chapter 21:05]. The Mines and Minerals Act gazetted in 1961 has been subject to some amendments so far. In addition, the revised Indigenisation and Economic Empowerment Act regulates the ownership structure on mining companies between indigenous and foreign ownership.

The right of searching for and mining of all minerals is vested in the President of the country, in terms of the Mines and Minerals Act. For one to prospect minerals, there is need to obtain a prospecting license or an Exclusive Prospecting Order (EPO). Prior to 1983, the marketing of mineral commodities was done by the individual companies, usually through agents in the OECD countries. However, since 1983 all mineral exports, except gold, have been controlled by the Minerals Marketing Corporation of Zimbabwe (MMCZ), to bring sanity into the trade of mineral resources. This came in handy in reducing costs to producers, and also eliminating transfer pricing.

As of current status, potential investors have to interpret the policy from diverse sources of information such as the Mines and Minerals Act, the Indigenization and Economic Empowerment (IEE) Act, the Zimbabwe Investment Authority Act, the Precious Stones Trade Act and the Diamond Policy (Centre for Natural Resource Governance, 2014). A closer analysis of these legal and policy documents reveal that there is no coherence and complimentary on these instruments. There exists conflict between the Indigenization and Economic Empowerment Act with the Zimbabwe Investment Authority Act in that the thrust of the ZIA Act is promoting foreign direct investment which seems contrary to what IEE Act promotes.

Table A2 presents the trends in mining production. It is clear that there is generally an increasing trend in the production levels and the discovery of new minerals such as diamonds and platinum. On the other hand, there is also a declining trend in the production of some minerals such as copper signifying the depletion of the commodity.

For example Table A2 shows that gold production increased steadily from 1980 through to 1998, then declined sharply from above 25000kg to less than 5000kg in 2008. The production of platinum has been increasing steadily over time. The platinum production witnessed a slump between 1998 and 2001 but eventually picked thereafter to reach a peak of 11000kg by 2011. Platinum, diamond and gold are among the important foreign currency earning minerals overtime in Zimbabwe. Copper mining and production in Zimbabwe has been declining overtime since 1980. Copper is produced for both domestic and foreign market. This means the contribution of copper to mineral export revenue is declining overtime. Both chrome and nickel have exhibited higher volatility production scales from 1980 through to

2012. The trend might have been influenced by structural changes within mining sector and changes in international prices of these minerals.

*Evolution of capital flight and total natural resources rents*

**Figure 3: Capital Flight and Total Natural Resource Rents**

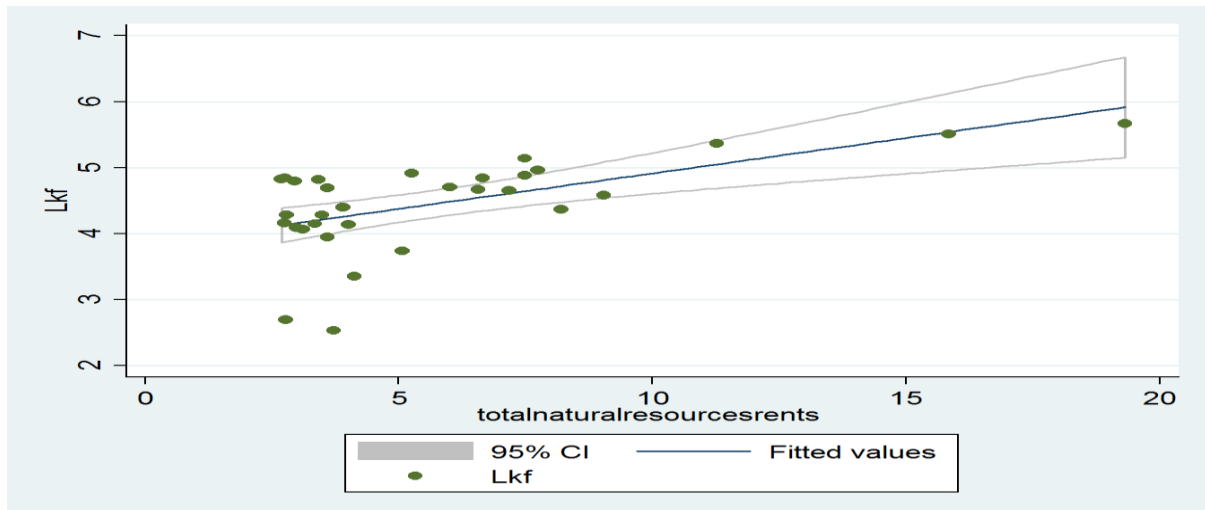


Figure 3 has capital flight in axis and total natural resources rents in x axis. There is generally a positive correlation between natural resource rents and capital flight. Thus for the periods when Zimbabwe has higher resource rents, it will also have higher level of capital flight. This shows availability of capital has a positive association with that capital being illicitly transferred offshore.

*Evolution of capital flight and institutions*

**Figure 4: Capital Flight and Property Rights**

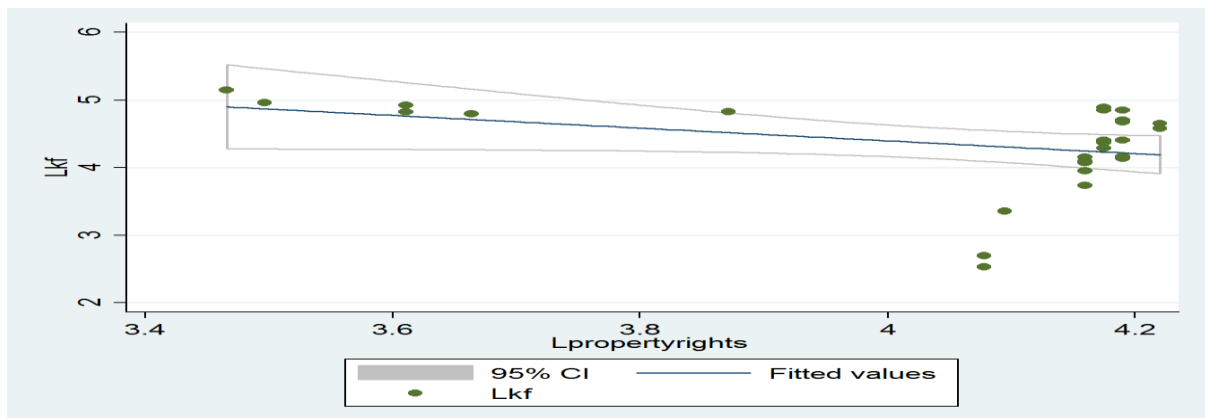
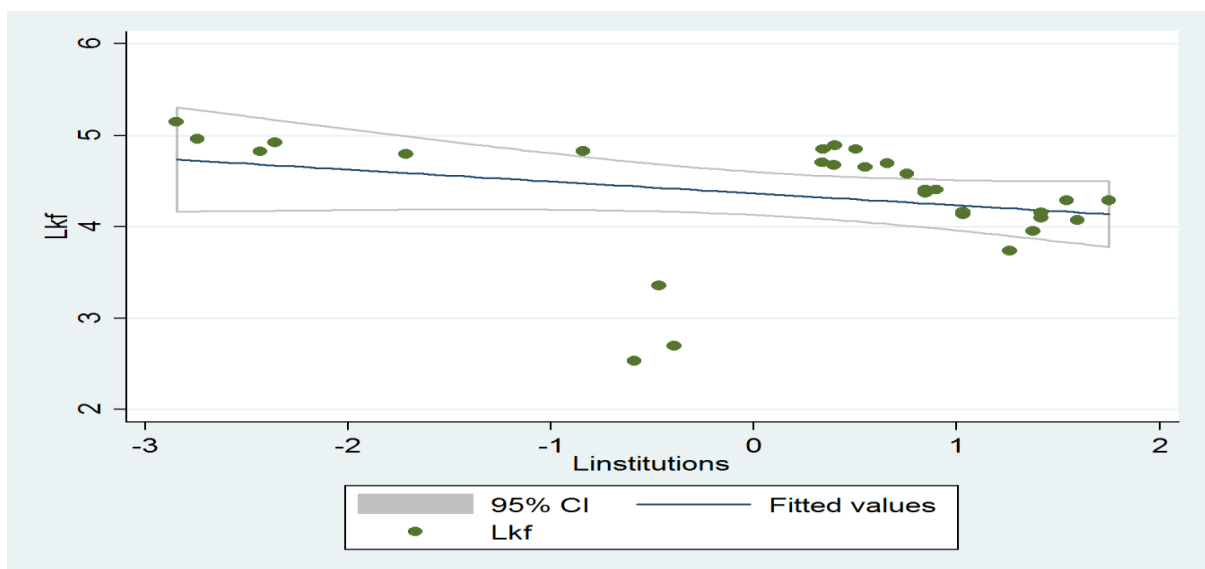




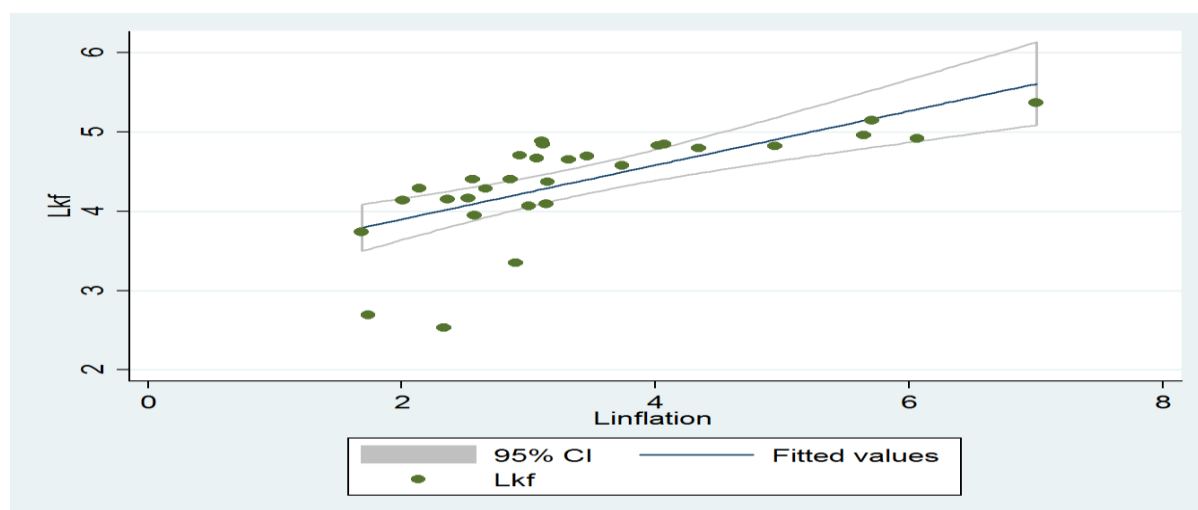
Figure 4 and 5 show a negative association between property and political rights in Zimbabwe overtime. The correlation with a composite index institution was negative. The associative relationship is derivative of the construction of these indexes. A higher total value of political and property rights means the political environment and property rights are good in the country. The negative relationship entails good property and political rights (denoted by high values) associated with low level of capital flight

**Figure 5: Capital Flight and Political Rights**



The capital flight, inflation and exchange rate have positive correlation in Zimbabwe. High inflation values are associated with higher levels of capital flight. A high value of exchange rate signals a depreciated local currency, high currency risk and is associated with high level of capital flight. Inflationary and exchange rate risks are correlated positively with levels of capital flight as shown by Figure 7 and A1 (in the Appendix).

**Figure 6: Capital Flight and Inflation**



### **3. BRIEF LITERATURE REVIEW ON MINERAL TRADE MISINVOICING AND CAPITAL FLIGHT**

This section reviews the related literature on trade misinvoicing and capital flight. Firstly Table A3 shows the studies related to trade misinvoicing. Capital flight occurs through export under-invoicing. This occurs when the exporter brings less capital into the country or through over-invoicing of imports, which allows the domestic importer to access more domestic foreign currency and take it out as if it was used to import goods and services. Morgestern (1963) pioneered the method of calculating trade misinvoicing, and Bhagwati (1964) later developed it.

There are lots of existing studies that track the determinants of capital flight. The main drivers of capital flight as Ndikumana & Boyce (2012) and Ionescu (2013) outline are: corruption, dysfunctional regulation, weak enforcement of rules, money laundering, tax evasion, tax avoidance, lack of transparency, high and persistent budget deficits, excessive external borrowing, and political instability.

Ljungberg and Friedl (2014) find evidence that natural resources endowment leads to capital flight. Rent seeking behavior explains the relationship. The study used natural resource rents as a share of GDP to proxy natural resources abundance. The study by Ljungberg and Friedl (2014) hypothesises that institutional quality will affect the relationship in two separate ways, through capital flight directly and through natural resource rents. The relationship with

capital flight would be negative if good institutions lessened the propensity for capital flight, while the effect on total natural resource rents would be positive if good institutions eased the process of extracting resources (Ljungberg and Friedl, 2014). The study concludes that bad institutions and natural resource rents motivate the occurrence of capital flight. This (our) paper tests the impact of natural resource rents, political and property rights on capital flight in Zimbabwe.

Adekunle (2012) finds that capital flight has a negative relationship with domestic investment in Nigeria. Results also indicate that exchange rate has no significant relationship with capital flight in Nigeria. The study uses the Ordinary Least Squares (OLS) for its econometric procedure. Ashman, Fine & Newman (2011) find that capital flight increased after the defeat of apartheid and has intensified the fall in capital investment in productive activities. They use qualitative approach to detail the relationship and also estimate the trade misinvoicing from different sectors of South African economy.

Ondo and Taylor (2012) find net borrowing, presence of natural resources, and political violence to be positively associated with capital flight in Sub-Saharan African (SSA) countries. The study uses a qualitative approach and finds out that the main factors driving capital flights are corruption and economic instability. This paper utilizes mineral exports as a share of total exports to proxy natural resources, macroeconomic stability (inflation and exchange rate) and institutions as key determinants of capital flight in Zimbabwe.

The study by Ndikumana and Boyce (2011) reaffirms the result that capital flight is a by-product of debt overhang, economic and political uncertainties in sub-Saharan Africa. The study utilizes pooled OLS, instrument variable fixed effect and GMM methodology to generate econometric results. Makocheke (2007) posits that external debt and FDI are the most important determinants of capital flight in the long run. The study also finds, utilising the cointegration methodology, that foreign reserves and economic growth have short run relationship with capital flight in Zimbabwe. His study however, neglects the role of mining sector and institutions influence in capital flight from Zimbabwe.

#### 4. ESTIMATIONS OF TRADE MISINVOICING

The purpose of this section is to estimate trade misinvoicing of Zimbabwe's main mineral exports, namely diamond, gold, nickel, ores and copper. These mineral constitute 18%, 18%, 11%, 3.1% and 1.1% (for refined copper) of total exports respectively. The study estimates total annual mineral trade misinvoicing, annual mineral trade misinvoicing for the main products and lastly, annual trade misinvoicing vis-a vis Zimbabwe's main trading partners. According to Zimbabwe Investment Authority, (2014) Zimbabwe's largest export partner is South Africa, which accounts for 32.4% of the exports, followed by Democratic Republic of Congo at 9.8% and Botswana at 8.8%. China, with a 5.6%, Zambia at 4.8%, Japan at 4.5% and Italy and the USA 4.5% and 4.3% respectively.

We calculate trade misinvoicing using three datasets for robustness check purposes: ZimStats; International Monetary Fund Direction of Trade Statistics; and the United Nations Commodity Trade Statistics Database (UNCOMTRADE). This enables us to estimate trade misinvoicing at different levels of aggregation at Harmonised System (HS), 2, 4 and 6 digit levels. Table A4 shows the mineral products, under various HS classification.

##### *Estimation Method*

Trade misinvoicing is done for several reasons such as tax evasion, quotas avoidance, smuggling, illegal money laundering, or for other unknown reasons (see De Boyrie, Nelson & Pak (2007)). In this study we focus on both export misinvoicing and import overinvoicing as possible ways used to facilitate capital flight or illicit capital outflows from Zimbabwe. Export underinvoicing is whereby Zimbabwean exporters report a smaller amount of money they receive from exports than being reported as imports by trading partners. While import overinvoicing is whereby Zimbabwean importers report a larger amount of money they use for importing than being reported by trading partners. The total of the two gives total capital that flows illegally in and out of Zimbabwe. Mathematically, trade misinvoicing is calculated at world, trading partner, product, and product- trading partner level. We follow existing literature ( see Ndikumana and Boyce, 2001; Beja, 2008; Buehn and Eichler, 2011; Patnaik, Gupta & Shah, 2012; Kar and LeBlanc, 2013) in estimating trade misinvoicing. Exporting misinvoicing vis –a-vis a trading partner is calculated as follows:

$$EM_{zt} = M_{jt} - (X_{zt} * CIF) \quad (1)$$

Where  $EM_{zt}$  is export misinvoicing of Zimbabwe (z) at time t,  $M_{jt}$  is imports from Zimbabwe as reported by trading partner j,  $X_{zt}$  is exports as reported by Zimbabwe to trading partner j at time t, and  $CIF$  is adjustment factor of 1.1 as per established standard (see IMF DOTS practice; Beja, 2008).

We estimate also export misinvoicing at product-country level, mineral exports at HS2, 4 and 6 in Table A3 as follows:

$$EM_{zjit} = M_{jit} - (X_{zit} * CIF) \quad (2)$$

$EM_{zjit}$  is the export misinvoicing of Zimbabwe (z) from trading partner j of product i at time t. A positive value of  $EM$  indicates export underinvoicing while a negative value indicates export overinvoicing. We are more interested in export underinvoicing as it indicates capital outflows and usually represents the biggest financial outflow of a developing country like Zimbabwe. This is because Zimbabwe is largely mineral endowed hence it mainly exports minerals than it imports. Similarly we are more interested in import overinvoicing - a situation where a Zimbabwean importer will report higher values or prices more than the value reported by the trading partner exporter. This results in money flowing out of the economy. Import misinvoicing for product-trading partner level is calculated as follows:

$$IM_{zjit} = M_{zit} - (X_{jit} * CIF) \quad (3)$$

Where  $IM_{zjit}$  is import misinvoicing by Zimbabwe (z) from trading partner j of product i at time t,  $M_{zit}$  is import of product i by Zimbabwe (as reported by Zimbabwe), while  $X_{jit}$  is export of product i into Zimbabwe as reported by trading partner j. A positive value of  $IM_{zjit}$  indicates import overinvoicing, as it shows that Zimbabwean importers are hiding money in inflated prices thus affecting capital flight.. A negative value indicates import underinvoicing.

To obtain global totals, net trade misinvoicing (TMISV) (illicit capital outflow) is found by adding export underinvoicing and import overinvoicing after multiplying them by inverse of the average shares of industrialised countries (or world total) in the Zimbabwe's export ( $ICXS_z$ ) and imports ( $ICMS_z$ ) (Ndikumana, Boyce and Ndiaye, 2014) as follows

$$TMISV_{zt} = \frac{EM_{zt}}{ICXS_z} + \frac{IM_{zt}}{ICMS_z} \quad (4)$$

### *Results: trade misinvoicing*

**Table 1** show trade misinvoicing by trading partner, using data from Standard International Trade Classification, Rev.4 (SITC) Ores and Metals (SITC 27+28+68). The results are found by estimating equation (4)- that is Total (net) Misinvoicing. It considers only major trading partners of Zimbabwe.

**Table 1: Total Trade Misinvoicing using Ores and Metals (SITC 27+28+68) data**

	2008	2009	2010	2011	2012	2013	Total (2008-2012)
<b>Australia</b>	-202230.3168	-334199.9827	-924535.1302	-1164873.704	0	0	-2625839.133
<b>Belgium</b>		-320322.4317	-819101.565	-1248338.908	-1624956.379	-948148.1748	-4960867.459
<b>Canada</b>	0	3596692.881	493002036.3	177310681.4	0	0	673909410.6
<b>China</b>	2210464.31	222321.952	2394288.229	10939284.74	-1494445.55	357519.6917	14629433.38
<b>Germany</b>	27736175.77	-1214058550	11960511.12	2677374.236	1297953111	2787785353	2914053974
<b>UK</b>	-142013.8839	-649675.2056	-960067.1037	-1465857.256	358905110.1	-1036207.282	354651289.4
<b>Greece</b>	0	0	-602601.9381	-958141.4441	0	1.65279E+11	1.65278E+11
<b>Italy</b>	1456712.676	183062.4948	1727616.632	2543793.612	0	7.27826E+12	7.27827E+12
<b>US</b>	7149200.164	14832803.36	154789320.3	72660826.45	2.46621E+11	0	2.46871E+11
<b>S.A</b>	406247.5519	-418758.1833	-1161745.432	-1090531.527	-1310366.792	-857363.1696	-4432517.552
<b>Zambia</b>	1560332.733	-260223.0502	1345942.095	753184.0047	-401981.2001	-1210135.738	1787118.844
<b>Total (Yearly)</b>	40174889	-1197206849	660751663.5	260957401.6	2.48273E+11	7.44633E+12	7.69436E+12

From Table 1 Canada, China, Germany, United Kingdom (UK), Greece, Italy, United States (US) and Zambia recorded positive trade misinvoicing. This suggests that these countries were used as gateways to facilitate capital flight out of Zimbabwe. The country through which Zimbabwe witnessed highest capital flight through trade misinvoicing is Italy. This might suggest that most of the minerals are being traded through Italy. Australia, Belgium and South Africa are the countries that enabled unrecorded capital to flight into the country. The highest illegal inflows come through Belgium.

Overall, across years from 2008 to 2013, there has largely been capital outflow from Zimbabwe in general except for 2009. This might suggest the unfavourable political landscape and macroeconomic environment. In 2008 Zimbabwe held presidential and parliamentary elections, which were largely disputed and ended up in a government of national unity. This might have facilitated capital flight as existing literature shows that politically less stable countries such as Nigeria and Zimbabwe have experienced a substantial

volume of capital flight (see Patnaik et.al, 2012). Political instability causes capital flight as agents seek to minimize the risk of expropriation and future portfolio losses due to political crises.

As from Table 1, year 2009 has negative sign on total flows across countries. This might also be explained by the macroeconomic landscape in Zimbabwe. The first scenario in 2009 was the adoption of multicurrency regime. This policy largely eradicates exchange rate risk hence possibly leading to increase in smuggling of capital into Zimbabwe.

The other remaining years (2010-2013) show largely positive misinvoicing. This shows that capital flight were high during these period. The might suggest that during this period, policy credibility may have been a problem. Further investment risk may have continued to be present even during the multicurrency period as existing studies show in other countries (see Ndikumana et.al. 2014). Also the 2013 elections might have contributed to increase in risk.

The study, next use trade data at Harmonised System (HS) 2 digit level in Table 2. We disaggregate the minerals into their broad categories starting with Pearls and Precious metal (HS71). The study shows trade misinvoicing though its three components, Export misinvoicing (EM), import misinvoicing (IM) and total (net) misinvoicing (TMISV). We disaggregate to see which of the two EM and IM is driving trade misinvoicing and also to see among the top trading partners which country is associated with highest trade misinvoicing.

**Table 2: Export Misinvoicing (EM), Import Misinvoicing (IM) and Total Misinvoicing (TMISV): Pearl and Precious stones**

		1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
<b>Belgium</b>	EM		200.8771	0	7.124	2257.37	-4765.36	-36112	-27577.6	-13243.5	-14108.6	-15928.1	-16610.3	-32875	-19731.4	42190.75	-134729
	IM		-207.457	-10.879	-5.0886	0	0	0.112	0	-0.6593	-102.672	-0.3645	-1.3539	-1.383	0	0	-329.745
	TMISV		-6.57962	-10.879	2.0354	2257.37	-4765.36	-36111.9	-27577.6	-13244.2	-14211.3	-15928.4	-16611.6	-32876.4	-19731.4	42190.75	-135058
<b>China</b>	EM								-0.0033	-0.8184	-0.0011	0.544	1236.407	2514.177	526.1016	8149.793	12426.2
	IM	19.792	-9.0167	2.612	122.3618	-5.3812	-9.0156	-11.6293	-27.7131	-26.37	-35.014	-57.7141	-110.469	28.2264	52.6658	45.06359	-22.5445
	TMISV	19.792	-9.0167	2.612	122.3618	-5.3812	-9.0156	-11.6293	-27.7164	-27.1884	-35.0151	-57.1701	1125.938	2542.404	578.7673	8194.856	12403.66
<b>Germany</b>	EM	1876.235	6292.105	1880.361	1437	5	0	-13.2374	899.978	407.989	16821.99	2262	2439.067	35.4059	836.83	1392.439	66941.64
	IM	-1711.74	-2622.4	-2438.23	-831.855	-2688.4	-2507.34	-2081.34	-3421.01	-1894.44	-2903.31	-1697.84	78.296	-1040.78	-1782.17	-3516.18	-39868.5
	TMISV	164.4921	3669.705	-557.866	605.145	-2683.4	-2507.34	-2094.58	-2521.03	-1486.45	13918.68	564.16	2517.363	-1005.38	-945.343	-2123.74	27073.18
<b>India</b>	EM	-620.016	73.74557	134.011	-188.902	438.761	46.3789	297.8437	215.7439	0	-350.114	1373.879	-17888.6	-663.061	-1549.48	1.028	-16500.3
	IM	1.238	-4.0084	4.4692	-37.4904	0	0.8982	-40.3983	-2.8375	-11.0976	-52.7339	64.26779	57.8838	-27.2116	-213.717	-47.2978	-469.42
	TMISV	-618.778	69.73717	138.4802	-226.393	438.761	47.2771	257.4454	212.9064	-11.0976	-402.847	1438.147	-17830.7	-690.273	-1763.2	-46.2698	-16969.7
<b>Italy</b>	EM	-5.4516	30099.97	15299.42	-779.957	5210.275	13627.21	2697.67	0	0	0	0	0	355.74	31.051	283.525	191119.6
	IM	-3452.4	-326.313	-373.225	-1180.07	-776.621	-93.3031	-158.816	-116.236	-1.17101	-2.54091	-37.6134	6.982599	0.116501	4.5159	-3.9388	-9072.86
	TMISV	-3457.85	29773.66	14926.2	-1960.02	4433.654	13533.91	2538.854	-116.236	-1.17101	-2.54091	-37.6134	6.982599	355.8565	35.5669	279.5862	182046.8
<b>SA</b>	EM	129.1085	108.9132	-42.1719	227.4066	341.698	-1083.91	-228519	-160597	-132227	-8473.68	-112431	-315976	-436312	-831056	-701329	-
	IM	6.9198	-114.7	-84.192	172.93	-325.468	343.9091	569.038	-19.1669	-262.216	114.7776	267.5793	98.75055	2989.604	46.60619	143.2021	3284.732
	TMISV	136.0283	-5.78708	-126.364	400.3365	16.22998	-740.003	-227950	-160616	-132489	-8358.9	-112164	-315877	-433322	-831010	-701186	-
<b>UK</b>	EM	-176.989	512.883	181.8581	-1838.27	424.917	3788.406	39018.61	28659.32	16166.56	12211.79	12181.61	23221.31	28680.48	10177.07	-152.647	175869.5
	IM	-4358.26	-1200.21	-784.103	-451.367	-2346.55	-169.894	12.7136	-6.9123	58.46579	-59.8387	-18.1274	8.412598	-17.9763	-12.7133	95.29	-22641.5
	TMISV	-4535.25	-687.331	-602.245	-2289.64	-1921.64	3618.512	39031.32	28652.41	16225.02	12151.95	12163.49	23229.72	28662.5	10164.36	-57.357	153227.9
<b>US</b>	EM	2584.767	9822.283	12809.24	-22175.9	11919.52	536.8442	-680.313	1057.842	592.2419	468.8222	8.8479	199.686	241.375	24.5314		103209.9
	IM	801.9077	0	-319.182	-4081.89	-4630.33	-881.193	-357.375	149.6762	173.103	2.285801	-12.3571	-19.1186	9.655	0.056		-10238.6
	TMISV	3386.674	9822.283	12490.06	-26257.8	7289.193	-344.349	-1037.69	1207.518	765.345	471.108	-3.5092	180.5674	251.03	24.5874		92971.27

NB:EM= Export misinvoicing, IM=Import misinvoicing and TMISV= Total Misinvoicing



**Table 2** firstly reveal that trade misinvoicing for pearls and precious metals ( HS71) is largely driven by export misinvoicing rather than import misinvoicing. This is logical from comparative advantage trade theory that stipulates that a country should produce and trade products which it is endowed with. Zimbabwe is largely endowed in minerals hence the larger export misinvoicing. The Table also reveal that import misinvoicing was largely negative across countries, showing imports were used instead to bring in unrecorded capital rather than sending it out through inflated prices.

The other emerging trend is that the countries with highest trade misinvoicing are Italy, UK, and United States. This support findings from Patnaik et.al (2012) that countries like Italy, France experienced capital flight through export underinvoicing in early 1980s (during period of capital account restrictions) saw a reversal in its trend since 1992 as capital started flowing into these economies through trade misinvoicing. This might be the case where developing countries like Zimbabwe have witnessed capital flight to these countries like Italy since 1992.

The other driver of trade misinvoicing might be change in government policy since 2000. The Zimbabwe government's Look East policy purports friendship with the East while it was unfriendly to European countries and United States. This might have driven capital out of Zimbabwe from these developed countries investors. However even the friendly countries like China shows capital flight from 2010. This might suggest that during the crisis period China was bringing in unrecorded capital into Zimbabwe, but as the economy improved China was sending out money from Zimbabwe as illegal repatriation of profits. This seems credible since China was largely investing in Zimbabwe during the crisis period.

Further, capital flight might be due to policy changes in the mining sector, the indigenisation policy (year 2009 upwards). This policy might have acted as a driver of capital flight as investors were solely scared to continually invest. This is coupled by the discovery of diamond in Marange which were largely not marketed transparently.

The country with highest negative sign for trade misinvoicing is South Africa. This suggests that South Africa was instead bringing in unrecorded capital into Zimbabwe. South Africa is Zimbabwe's biggest trading partner and also a close geographic neighbour. Furthermore, the majority of Zimbabweans are residing in South Africa. As such, the high capital inflows are possibly due to neighbourhood effects and the ease of hiding money in both exports and

imports. This might suggest lack of tight border controls between the countries creating avenues for these inflows of unrecorded capital.

**Table 3** now compares across product groups at HS2 for Ores, slag and ash (HS26), copper and articles (HS74), and Nickel and article (HS75). The Table only shows total trade misinvoicing comparing across major trading partners for these commodities.

**Table 3: Comparing Total Misinvoicing for Ores (HS26), Copper (HS74) and Nickel (HS75)**

		1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
<b>HS26</b>	Canada			2.264					-0.0011		1143.146	874.389	3.4445	935.397	81.885	3906.669	6978.037
	Germany		9881.657	10288.9	9227.933	2971.8	11068	12088.48	26204.2	20150.84	20769.74	2439.998		-0.055			125640.7
	India	14.092		-5.8245	-11.3344			19.4912	-5.7167	0.032				0.4393	-0.4774	0.546	87.4415
	SA	1072.855	-23036.9	-12458.2	-88128.4	131097.9	-18384.8	36681.59	6065.789	-849.154	89390.98	-187922	-299062	-233962	-257060	-220001	-1074613
	UK	1904.668	1421.57	0.759			-101.88		5.3326	-863.896	-273.412	-715.877	-466.279	-5.6468	-0.1166	-0.2695	43005.96
	US				2333.729			0.109	1.9969	-634.275	-400.516	-66.066		0.486	0.345		1292.606
<b>HS74</b>	Belgium		-1.1231		3.21	-1.2672	0.501	1.2848	0.2447	2.4785	-1.4382	-0.6428	-0.31	-1.5251	-2.3376	1.8425	-50.8287
	Canada	-20.3346	3636.953		3.161	0.098			0.016	0.032		1.521	0.0649	0.141		-1.3247	21743.94
	China	11647.93	-9.9352	-21.5133	2.999	0.156	27.963	-82.6311	-26.337	15.2511	1.2905	0.9926	3220.977	112.6625	24.48761	4155.927	23302.44
	Germany	1814.806	1364.584	230.8199	-10387.8	58.2	2748.842	28134.96	43651.89	44802.59	19732.32	12764.36	15233.31	6637.074	24291	-14.7697	201480.4
	India	1354.675	-6.9586	-16.4592	-29.1692	23.095	6.355	-65.2982	-779.26	765.6204	-380.555	29.3419	-2351.11	-312.694	-417.855	372.1253	-2557.72
	Italy	22.11501	800.6117	-109.676	38.58231	-114.708	-45.1989	1.425003	-29.9056	48.6668	-19.0465	-15.8467	109.6248	18.86561	-310.84	211.5766	19383.4
	SA	22728.61	-2567.04	1086.178	511.4512	-1392.36	41841.89	-2873.61	-287.364	2838.37	-222.323	138.1739	-314.584	923.8901	-13593.5	-212.287	45523.45
	UK	-11975.2	708.2585	-1167.43	-1500.77	-964.975	-464.797	-655.171	-279.975	131.9777	59.43649	-2152.81	-932.955	-2488.32	20.6461	6.252	-21721.7
	US	-30.4441	-40.8728	-0.1596	61.63	16.363	9.347	-18.3977	7.887801	3.009708	8.154	-5.8711	23.8881	10.9997	45.7428	1.243001	822.6314
	Zambia	-158.863	-3277.26	-240.531	3485.881	-3669.06	-128.011	444074	11495.42	3818.821	571.6761	2004.668	5253.508	4919.869	8515.646	-29862.1	432581.8
<b>HS75</b>	Canada	143.3692	105.955	3.188	18.33		32.593	196.108	1320.73	1882.09	651.751	522.6219	2614.471	1706.09	1147.958	1749.479	12264.21
	China		790.265	1903.578	4263.753	4396.988	3434.481	12735.68	16723.96	2708.783	0.006	3186.715	1790.404		61.514	7088.514	59377.84
	Germany	-1671.41	-1597.99	-64980.3	-38099.8	12421	4250.029	1954.043	2195.405	0.904001	194.727	333.365	285.634	4.372	-0.6398	-0.6853	-37755.3
	India	170.203	-0.4367	659.3762	4056.751	1045.036	14085.02	6445.114	3414.005	7736.741	3543.364	5693.604	3614.009	-15.7847	218.847	404.92	52757.72
	Italy	-18018.7	-11325	1061.441	708.463	1598.773	277.084	10004.17	13749.01	17187.93						1562.393	74190.02
	SA	-31186.8	-598.525	1460.129	2811.992	25067.84	-73083.4	62444.85	93667.85	137579.9	175242.7	-214715	-462213	-558014	-379819	-451235	-1717403
	UK	-11975.2	708.2585	-1167.43	-1500.77	-964.975	-464.797	-655.171	-279.975	131.9777	59.43649	-2152.81	-932.955	-2488.32	20.6461	6.252	-21721.7
	US	-30.4441	-40.8728	-0.1596	61.63	16.363	9.347	-18.3977	7.887801	3.009708	8.154	-5.8711	23.8881	10.9997	45.7428	1.243001	822.6314
	Zambia	-158.863	-3277.26	-240.531	3485.881	-3669.06	-128.011	444074	11495.42	3818.821	571.6761	2004.668	5253.508	4919.869	8515.646	-29862.1	432581.8

**Table 3** shows that across all three groups of minerals (Ores, slag and ash (HS26), copper and articles (HS74), and Nickel and article (HS75)), Zimbabwe witnessed capital flight through United States, Canada and Germany. This might suggest these developed countries which Zimbabwe was hostile to were used as avenues for capital flight out of the country. This supports existing empirical evidence, which finds that unsound economic policy and political instability (Schilze, 1994) might be driving Zimbabwe’s capital flight. Further, Ndikumana and Boyce’s (2003) findings that political freedom and accountability drive capital flight might hold for Zimbabwe’s case. Zimbabwe during this period has not received high ratings on these fronts.

Other countries like UK witnessed both positive and negative outcome on trade misinvoicing across these minerals. For example, positive sign for Ores, negative for copper and Nickel. It shows that different mineral groups might be associated with different outcomes of capital flight. South Africa witnessed same sign across the three minerals groups, largely reflecting illicit capital inflows into Zimbabwe.

Comparing across the three minerals, the results show that the highest capital flight is through nickel. This also supports that Nickel is a major mineral product in Zimbabwe ahead of the ores and copper.

***Product level estimation-HS6 and HS4 digit level results***

This section tracks only export misinvoicing since we have seen above that export misinvoicing dominates over import misinvoicing. Figure 8 shows export misinvoicing for gold and diamond at Harmonised System (HS) 6 digit levels.

**Figure 8: Export Misinvoicing: HS710210 (Diamonds Unsorted) and HS710812 (Gold in Other Unwrought Forms)**

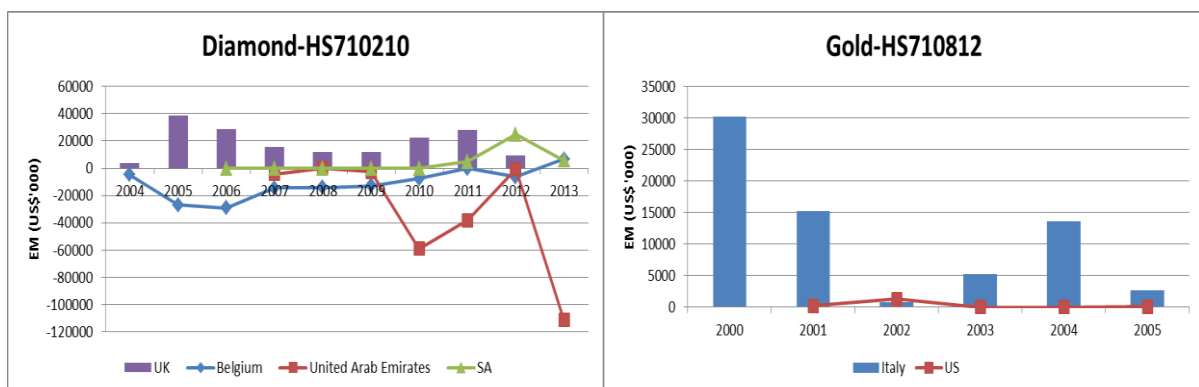


Figure 8 shows that for unsorted diamonds (HS710210) Zimbabwe exporters' under-report trade transactions with UK and South Africa. The same occurs for gold in other unwrought forms (HS710812), vis-a-vis countries. The results suggest high export misinvoicing on those minerals largely controlled by multinational companies. This supports Jordan et.al (2012)'s finding that foreign ownership is a driver of trade misinvoicing.

At HS4 codes we show the results for diamond and gold. Figure 9 shows traces export misinvoicing for diamonds (HS 7102).

**Figure 9: Export Misinvoicing: Diamond: HS7102**

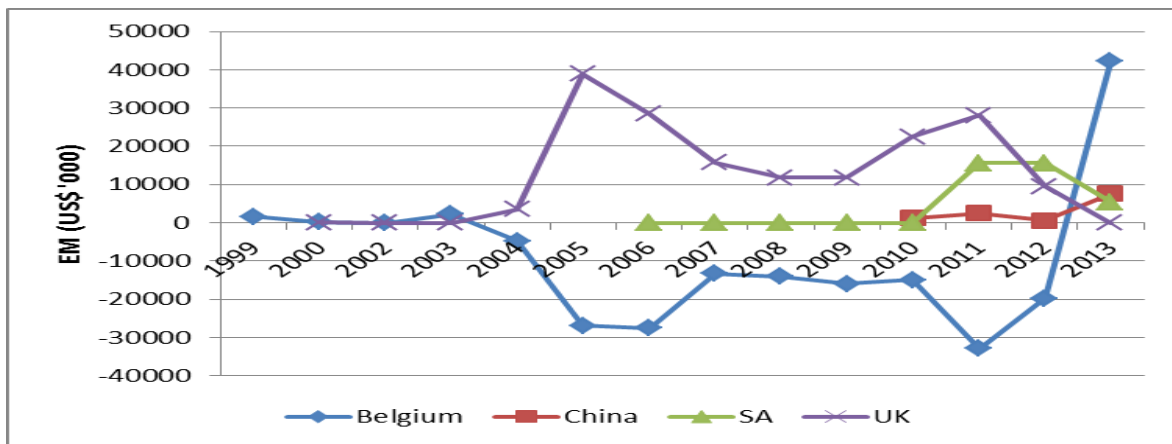
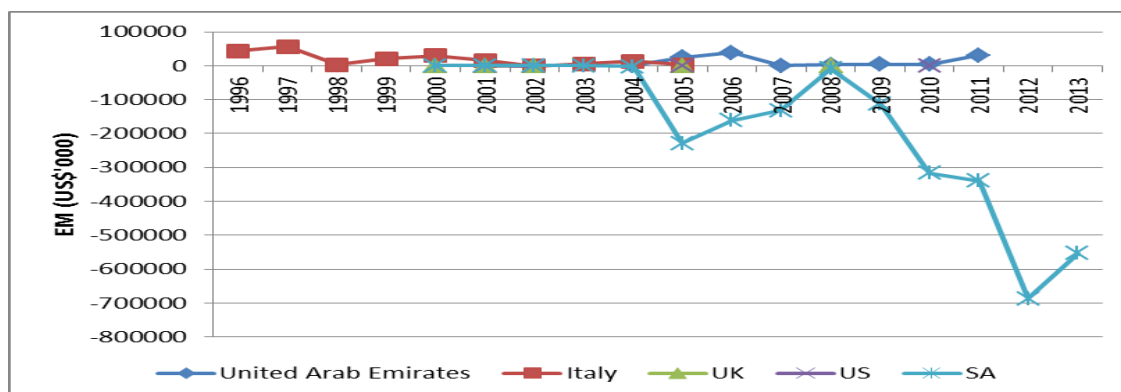


Figure 9 shows the diamond export misinvoicing is largely witnessed in European countries. It largely occurs with United Kingdom (UK), the former coloniser of Zimbabwe up to 1980. The positive trend suggests unrecorded capital flight. Exporters also move capital out of Zimbabwe through China and South Africa. The results suggest that illicit capital outflows increased during the economic crisis, especially from 2004. Belgium is the only country that shows export overinvoicing, a situation which shows illicit capital inflows into the country.

We also show in Figure10, export misinvoicing for gold. We just select major trading partners for this product.

**Figure 10: Export Misinvoicing: Gold: HS7108**



The results in Figure 10 show that Zimbabwe has unrecorded bilateral trade with Italy, United Arab Emirates and UK. However, in the case of South Africa Zimbabwe exporters are bringing in unrecorded capital from South Africa. This might suggest that majority of Zimbabwe mining companies are from South Africa; hence they largely want to bring illegal capital to aid their business. We also did the same analysis for platinum; although there are few available data points due to lack of data. However, the results show that there is “unexplained” trade between Zimbabwe, Switzerland and Germany.

## 5. THE DETERMINANTS OF CAPITAL FLIGHT

This section describes the method employed to investigate the determinants of capital flight with focus on natural resources and institutions. The study uses econometric analysis to investigate the relationship between capital flight, natural resources and institutional quality. The initial simple function to be estimated is as follows:

$$KF_t = f(nr_t, iq_t, Z_t) .$$

Where  $KF_t$  is capital flight at time t,  $nr_t$  is natural resource at time t,  $iq_t$  is different institutional quality indexes at time t and  $Z_t$  is all other control variables such as macroeconomic factors at time t.

The diagnostics tests and data description is contained in table A5 and A6 in the appendix section. Data used was in annual series and ranging from 1970 to 2008. This data was sourced from World Bank Development Indicators for macroeconomic variables and

measures of natural resources abundance. Institutional variables were obtained from Gwenhamo, Fedderke and de Kadt (2008).

### *Descriptive Statistics*

The descriptive statistics in Table A7 (in the Appendix) shows that the macroeconomic environment in Zimbabwe varied widely from the mean as denoted by the standard deviation statistic. Inflation, exchange rate, capital flight, institutional environment and economic performance of the sectors are variables that show high variation from the mean. The next section tracks the degree of association between capital flight, measure of natural resource abundance, institutional and macroeconomic environment.

### *Correlation*

**Table 4: Correlation matrix**

	Capital flight	Natural resources rents	Property rights	Political rights	GDP	Inflation	Exchange rate	Institutions	Macro instability
Capital flight	1.00								
Natural resources rents	0.33*	1.00							
Property rights	-0.08	0.14	1.00						
Political rights	-0.50*	0.28	0.47*	1.00					
GDP	-0.19	0.13	0.42*	0.46*	1.00				
Inflation	0.80*	0.25	-0.26	-0.55*	-0.45*	1.00			
Exchange rate	0.94*	0.27	-0.13	-0.61*	-0.25	0.82*	1.00		
Institutions	-0.57*	-0.26	0.49*	0.99*	0.44*	-0.60*	-0.68*	1.00	
Macro instability	0.82*	0.27	-0.24	-0.51	-0.38*	0.78*	0.83*	-0.57*	1.00

Table 4 shows that natural resources rents, political rights, inflation, exchange rate institutions and macroeconomic instability has significant correlation with capital flight. Capital flight and natural resource rents has significant and positive correlation. This suggests that capital flight is a phenomenon associated with countries that have higher natural resource rents. Capital flight, institutional quality (property and political rights) and macroeconomic instability have negative and significant correlation. This suggests poor quality institutions and a bad macroeconomic environment are associated with higher level of capital flight in Zimbabwe. Political and property rights are negatively and significantly correlated with

measures of macroeconomic environment. A good institutional environment is likely to associate with low levels of inflation and strong local currency.

### ***Regression Results***

**Table 5: Determinants of Capital Flight: Regression Results**

<b>Variables</b>	<b>1</b>	<b>2</b>	<b>3</b>
Natural resources rents	0.02 (0.58)	0.14 (0.03)**	0.08 (0.16 0.08 (0.53))
Institutions			
Political rights	0.73 (0.07)*	0.82 (0.23)	
Property rights	1.1 (0.05)**	-1.7 (0.04)**	
Inflation	0.78 (0.000)***		
Exchange rate		-0.02 (0.66)**	
Macro instability			0.72 (0.09)*
GDP per capita	0.04 (0.002)**	0.01 (0.50)	
Constant	-5.7 (0.02)**	7.4 (0.02)**	4.06 (0.00)***
R-squared	0.78	0.32	0.54
N	29	29	29

Note: the p-value are the ones contained in brackets under the coefficient of each independent variable, \*\*\*  $p < 0.1$ ; \*  $p < 0.05$ ; \*  $p < 0.01$

The regression results in Table 5 show that capital flight is significantly related to natural resources rents, property rights, political rights, inflation, exchange rate and macroeconomic instability. Natural resource rents availability is associated with high level of capital flight in Zimbabwe and the relationship is significant at 5%. Property rights have a negative and significant relationship with capital flight. Poor property rights are associated with heightened capital flight in Zimbabwe and this makes economic sense. Ndikumana and Boyce (2011) find the same results. Ondo and Taylor (2012), for the case of SSA countries found that economic instability coupled with corruption and natural resource availability fuel capital flight. In the case of SSA countries Ondo and Taylor (2012) found economic instability coupled with corruption and natural resource availability fuel capital flight.

Le and Rishi (2006) provide evidence that corruption does promote capital flight. Revenue Watch's Resource Governance Index (RGI) argue that Zimbabwe's institutional framework is



non-competitive and lacks mechanisms to promote accountability in mining sector (Centre for Natural Resource Governance, 2011). This might be the explanation for positive contribution of natural resource rents to capital flight in the period under review in Zimbabwe.

**Table 5** also shows that inflationary pressures and depreciation of exchange rate lead to high levels of capital flight. This makes economic sense, since high level of inflation leads to high uncertainty on future investment returns and this will lead to investors seeking safe havens outside Zimbabwe, regardless of laws governing capital flows. Strong currency discourages potential investments, reduces internal rate of returns of domestic financial markets and hence incentivises illegal capital outflows. It is interesting to note that high levels of capital flight in excess of USD\$100 million was recorded from 1993 through to 2008. This is the period linked with high level of economic and political mismanagement that resulted in economic crisis in Zimbabwe. The same period has increasing contribution of mineral sector to GDP but sluggish economic growth, hence higher incidence of capital flight that can be linked to the mineral sector. Cerra, Rishi and Saxena (2008) find evidence that weak institutions and bad macroeconomic policies affect the ability of a country to manage debt because poor institutions spur capital flight which creates financial need. This evidence is from a sample of developing and emerging market countries. The results from Table 5 support this finding. Natural resources rents have a positive and statistically significant role in determining capital flight. Macroeconomic instability in terms of the role of inflation and exchange rate risk has a positive and significant relationship with capital flight. During the period of higher inflation and depreciated exchange rate, there is higher uncertainty, hence higher capital flight from Zimbabwe. This was also confirmed by heightened capital flight flows during the period 1993 to 2008.

## **6. CONCLUSION AND POLICY IMPLICATION**

The aims of this paper are threefold. The first is characterising the evolution of mining policies and changes in the mineral ownership structure in Zimbabwe. The results show that most of the mining companies operating in Zimbabwe are foreign owned. This is what the Indigenisation and Economic Empowerment Bill is trying to address. Thus ownership of

mining companies to some extent has left the minerals resources vulnerable to smuggling and illicit flows, as the Zimbabwe government becomes hostile to foreign investors. There is therefore need to ensure investment continuity and provide safe assurance in the mining sector. There is also need to put in place strict measures to monitor both local and foreign owned mining companies to curb the capital flight. During the period of macroeconomic stability and political stability, the contribution of the mining sector to economic growth has been impressive and shown positive correlation to economic growth. There is therefore need to ensure political and macroeconomic stability.

The second objective is estimating capital flight through trade misinvoicing. The results from trade misinvoicing show that foreign companies are driving trade misinvoicing as shown by high export underinvoicing from countries that have large numbers of multinational companies operating in Zimbabwe. Further, the results show that capital flight increased during the crisis period. This indicates that foreign companies largely took their capital out of Zimbabwe during the crisis period. The implications are that macroeconomic stability and enacting clear policies on how multinational companies operate is key to purge capital flight.

The last objective is to investigate the link between capital flight, natural resources and institutions. The results show that the higher the macroeconomic stability the higher the capital flight. This implies that government should ensure macroeconomic stability by reducing inflation and exchange rate volatility if they are to curb capital flight. The results also show a positive relationship between capital flight and mineral sector output (natural resources rents) implying that capital flight is a derivative of realised capital from mining sector in Zimbabwe. This entails that the government should introduce proper policies are transparent and that does not scarce away continuous investment in natural resources and allow retention of capital from natural resource exports. Lastly institutions have a negative relationship with capital flight, as theoretically expected. It infers that government should increase institutions effectiveness to deal with capital flight. This result is interesting because good institutional quality is also known to encourage capital accumulation and pull FDI flows.

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## Appendix 1

### Definition of variable and data sources

#### Capital Flight:

**GDP per capita growth:** Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2005 U.S. dollars. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

**Inflation, consumer prices (annual %):** Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.

**Official exchange rate (LCU per US\$, period average):** Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar). All macroeconomic variables were obtained from World Bank Development Indicators (WDI).

**Political rights:** the index captures the idea of socio-political unrests and disturbances. The reasoning being that when instability reaches high levels, socio-political instability disrupts markets activities which in turn affects productivity and therefore returns to investment (Alesina and Perroti, 1996). Gwengamo et al (2012) constructed this variable. They believe political instability might result in bad economic policy because governments choose not to improve the efficiency of policy making, since they anticipate an imminent loss of power. Unstable political systems results in weak governments that are unable to change and improve policy formulation. Olson (1982) argues that very high levels of political instability may be desirable, since it destroys the hold on the state exercised by powerful interest groups who are more concerned with the imposition and maintenance of redistributive policies than with sound growth enhancing economic policy. The political rights index is made up of number of declarations and renewals of states of emergencies per year, number of

publications banned per year, number of political motivated arrests per year, number of reported cases of politically-related property damages per year and incidences of war-related armed attacks on the general public per year.

**Property rights:** the index constructed relates to immovable property, with particular focus on land (Gwenhamo et al. 2012). The rationale for focusing on immovable property was that Zimbabwean economy is primarily an agro-mining economy implying that immovable property such as land plays a huge role in facilitating economic transactions. The methodology used by Gwenhamo et al (2012) follows an initial identification of an ideal set of rights. These rights include right to possess, manage and use land, right to the capital value, power to transmit, right to its income, and right to security against land expropriation. Zimbabwe's realisation of this ideal set of rights was examined with reference to the most important pieces of legislation affecting these rights over this period. The resultant property rights index that was constructed by Gwenhamo et al (2012) corresponds to the procedural rules constraining state and elite's expropriation and not outcomes of whether there is actual expropriation.

**Total Natural Resources Rents:** Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. The data is from World Development Indicators (WDI).

**Table A1: Mine Ownership in Zimbabwe and Source Countries**

Mine	Source Company	Source Country
Hartley Platinum Mines	BHP	Australia
Turk Mine	Mine Casmyn Corporation	Canada
Eureka Gold Mine	Delta Gold	Australia
Indarama Gold Mine	Trillion Resources	Canada
Jena Gold Mine	Trillion Resources	Canada
Rio Tinto Zinc Corporation	Rio Tinto	UK
Chaka Processing Plant	Delta Gold	Australia
Bubi Gold Mine	Anglo American	SA
Mimosa Platinum Mine	Implats, Aquarius	SA, Australia
Zimplats Selous Mine	Implats	SA
Independence Gold Mines	Metallon	SA
Unki Platinum Mine	Anglo Platinum	SA
Bindura Nickel Corporation	Mwana Africa	UK/SA
Murowa Diamonds	Rio Tinto plc	UK
Freda Rebecca Gold Mine	Mwana Africa	UK/SA

Source: Saunders R, (2008)

**Table A2: Mineral Production for the period 1980 to 2013**

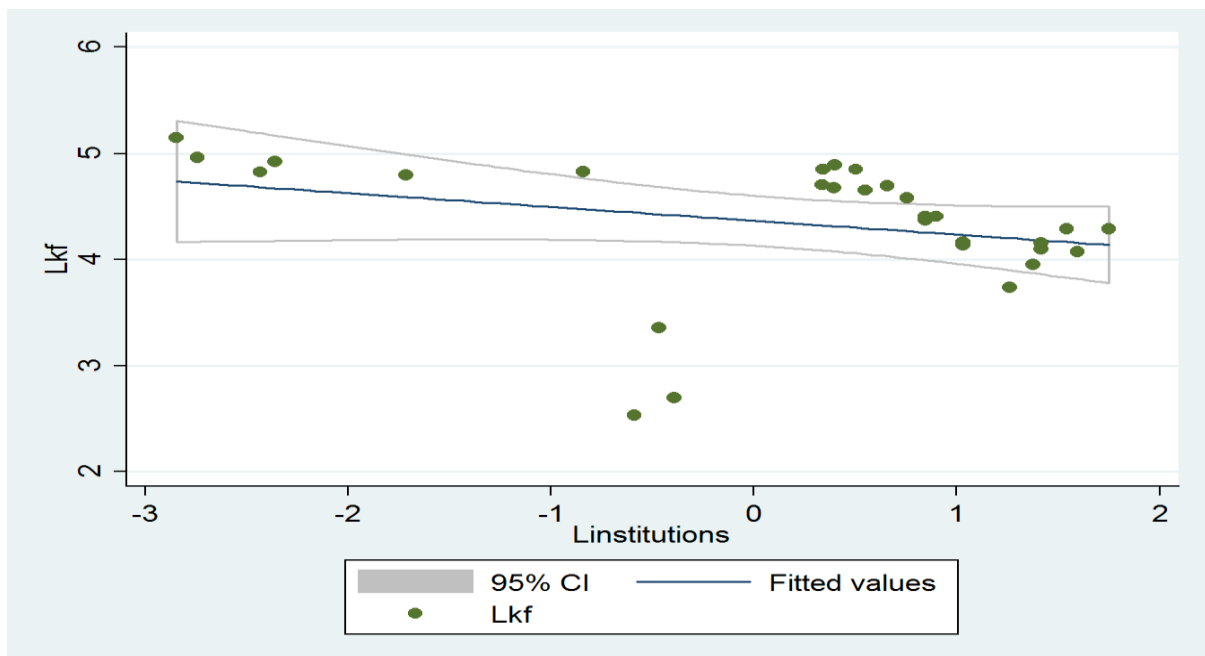
Year	Gold /Kg	Platinum/Kg	Nickel/tns	Copper/Tons	Chrome/Tons	Cobal/Tons	Diamond/carats
1980	11444		15075	26901	552475	115	
1981	11691		13018	24583	536052	93	
1982	13367		13301	24683	432410	97	
1983	14101		10146	21560	420347	74	
1984	14877		10251	22687	476521	78	
1985	14691		9381	20390	526490	92	
1986	14853		9730	20423	553105	76	
1987	14710		10394	18819	570297	110	
1988	14961		11490	16116	561630	126	
1989	16003		11633	15659	627424	112	
1990	16900		11442	14698	573103	123	
1991	17820		11312	13811	563634	105	
1992	18278		10115	9673	522013	100	
1993	18565		11889	8187	252033	113	



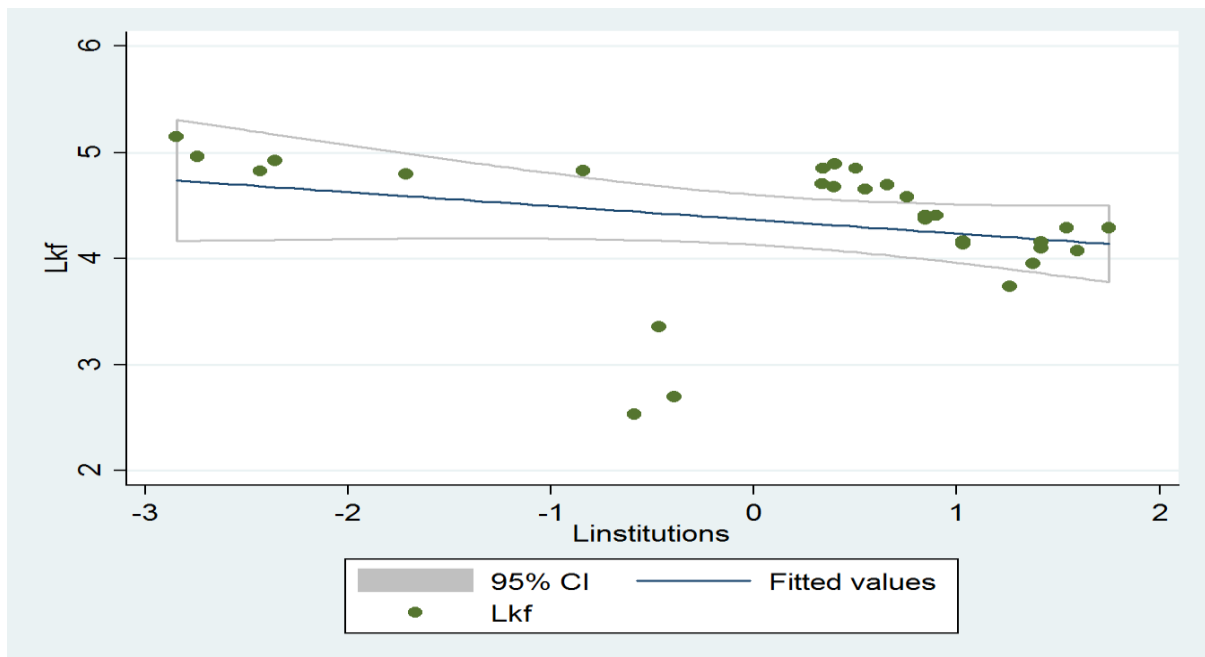
1994	20515		13518	9350	516801	126	
1995	23959		10863	8045	631382	109	204416
1996	24699	7	9695	9028	697323	106	437266
1997	24156	345	7136	4993	759954	126	421307
1998	25175	2730	8615	5952	620118	99	28732
1999	27114	390	9139	4977	640735	119.11	42578
2000	22069	505	4670	3140	653479	103.11	230028
2001	18050	519.08	8145	2313	780150.3	94.73	
2002	15469	2306.34	8092	2502	749339	86.66	
2003	12564	4269.78	9516	2798	637098.7	80.56	
2004	21330	4437.98	10217		668390.8	58.67	
2005	14023	4833.45	9220		670029.1	30.4	
2006	11354	4997.72	8825		700000.8	26.3	
2007	7018	5085.74	8582		614558.8	29.03	
2008	3579	5495.1	6354		442584.2	28.19	
2009	4966	6848.9	4858		193673.7	39	1,305,693
2010	9620	8639	6133		516776		8435584
2011	12993	10827	7992		599079		8718570
2012	14065	10524	7899		408475		12014802
2013	14065	10528	14057	8275	450000		10528

Source: Chamber of Mines

FigureA1: Capital Flight and Institutions



FigureA2: Capital Flight and Exchange Rate



**Table A3: Empirical studies on Trade Misinvoicing**

Author	Focus and scope	Methodology used	Data used and source	Results
Yalta and Demir (2011)	The extent of Trade Misinvoicing in Turkey: Did the Post 1990 Policies matter? The study establish the implications of policies (Liberalization and Custom Union with EU) which were implemented post 1990 on trade misinvoicing	Trade invoicing is estimated using Turkey's imports and exports with its major trading partners using a method pioneered by Morgenstern (1963) and later developed by Bhagwati (1964). Adjustment of CIF to FOB was done using a factor of 1.1	Bilateral trade data between Turkey and its major trading partners between 1990-2007	Over invoicing was the main export misinvoicing trend as a result of export subsidies. Import misinvoicing exhibited an oscillating pattern.
De Boyrice (2007)	Capital movement through trade misinvoicing: The case of Africa	Deviations from average prices (price filter matrix) within the commodity trade classes was used to identify abnormal prices	Africa trade data for exports and imports from US Export (Import) of Merchandise Statistics. 2000-2005 trade data from 58 Africa countries to US	Between 2000-2005 capital outflow from 58 countries in Africa to US had grown by more than 50% both through low priced exports and high priced imports.
De Boyrice (2010)	Determinants of capital flight and capital movement through trade misinvoicing: The African Case	World Bank Residual Method to estimate capital flight. Trade misinvoicing to estimate capital movement	Data for 48 countries used from 2007 World Bank's World Development Indicators, US Export and Import of Merchandise Statistics.	5 set of variables explained capital flight and capital movement but for only a few countries. Risk and return, financial development and fiscal policy variables explained capital movement
Patnaik et al (2012)	Determinants of trade misinvoicing.	Misinvoicing was calculated by looking at the bilateral export import data between individual countries and their trading partner.	Trade data for 35 countries classified under developing and industrialized for the period 1980-2005 was obtained from IMF Data on Trade and Statistics which reports bilateral merchandise exports and imports between trading partners	Misinvoicing was seen to be higher among developing countries than industrialized countries.
Buhen A and Eichler S (2011)	Use of microeconomic framework to derive the determinants of four different types of trade misinvoicing	The hypothesized determinants are tested using data on discrepancies in bilateral trade with the U.S.	Data from 86 countries for the period 1980 – 2005. The data from IMF's Directions of Trade Statistics (DOTS) database	Black market premium and tariffs were found to motivate illegal trading activities. Higher financial penalties effectively act as a deterrent to this crime

**Table A4: Minerals: HS digit codes**

HS Code	Mineral description
Hs2- 71	Pearls, stones, prec. Metals, imitation jewellery, coins
HS4-7102	Diamond
HS6	
710210	Diamonds Unsorted
710221	Industrial Diamonds, Unworked or simply sawn, cleaved or bruted
710229	Other Industrial Diamonds
710231	Nonindustrial Diamonds, Unworked or simply sawn, cleaved or bruted
710239	Other Nonindustrial Diamonds
HS4-7108	Gold
710811	Gold Powder, Unwrought
710812	Gold in Other Unwrought Forms
710813	Gold in Other Semi-manufactured Forms
710820	Monetary Gold
HS4-7110	Platinum
711011	Unwrought or in powder form platinum content
711019	Other platinum content
711021	Unwrought or in powder form palladium content
711029	Other palladium content
711031	Unwrought or in powder form rhodium content
711039	Other rhodium content
711041	Unwrought or in powder form ridium, osmium and ruthenium contenet
711049	Other ridium, osmium and ruthenium content
Hs 71	Pearls and precious stone
HS26	Ores, Slag and ash
Hs72 and 73	Iron and steel
Hs74	Copper and articles
Hs75	Nickel and Articles
Hs76	Aluminium

**Table A5: Stationary test**

Variable	T-statistic (Dickey-fuller)	T-statistic (Phillip-Perron)	Decision
Capital flight	2.86	2.63	stationary
Institutions	0.21	-0.97	Non-stationary
Macro instability	4.75	11.6	Stationary
Property rights	1.28	0.60	Non-stationary
Political rights	-1.1	-1.32	Non-stationary
GDD per capita growth	-4.14	4.13	Stationary
Exchange rate	56.64	70.60	Stationary
Inflation	2.33	8.05	Stationary at all levels (phillip perron)
Total natural resource rents	2.011	0.959	Non-stationary
Critical values	1% = -3.68, 5% = -2.97 10% = -2.62	1% = 3.66, 5% = 2.96 10% = -2.61	

Table A5 shows that property rights, political rights, capital flight and institutions are not stationary at levels, but other variables are stationary. The stationarity results show that macroeconomic variables tend to converge to their long run equilibrium values. The other variables however show persistence tendency over time; that is institutions and capital flight. This is as expected especially for institutional variable; institutions tend to follow certain character over time and take a long time to change.

**Table A6: Data Description and sources**

Variable	Description <sup>5</sup>	Source
Capital flight	Adjusted BOP residual	Boyce and Ndikumana, 2012
Mining policies	Royalties and other policies	Jordan et al 2012, MMCZ
Mining ownership	Company profiles and	Jordan et al 2012, MMCZ

<sup>5</sup> See the detailed definition of the variables in the appendix section

structure	government ownership stake	
natural resources rents	oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents	World Bank Development Indicators
Institutional data	Property rights and political rights	Gwenhamo, Fedderke and Kadt (2008)
Macroeconomic factors	GDP per capita, Inflation, Exchange rate, Debt, fiscal balance	Zimstats, RBZ

Table A7: Summary on Capital Flight, Natural Resources Abundance, Institutions and Macroeconomic factors

Variable	Observation	Mean	Standard deviation	Minimum	Maximum
<b>Capital flight</b>	32	4.5	0.69	2.5	5.7
<b>Property rights</b>	36	4.1	0.21	3.5	4.2
<b>Political rights</b>	36	4.1	0.24	3.7	4.5
<b>Mineral exports</b>	39	0.38	0.08	0.22	0.54
<b>Inflation</b>	37	3.04	1.43	0.75	7.0
<b>Exchange rate</b>	37	5.22	27.2	0.001	164.5
<b>GDP per capita</b>	39	-0.94	7.05	-18	18.6
<b>Institutions</b>	36	-1.01e-09	1.27	-2.85	1.75
<b>Macro instability</b>	37	-1.32e-08	1.38	-0.41	7.83