Capital Flight and Transfer from Resource-Rich Developing Countries

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Abstract

This paper analyzes the influence of international resource price movements on capital outflows from resource-rich developing countries (RRDCs) by distinguishing capital *flight* and capital *transfers.* The volume of capital flight and transfers are calculated and their determinants are analyzed using macro-panel data constituting 21 resource-rich developing countries from 1990 to 2011. Through the regression analysis, the linkage between capital flight and resource revenue as well as that between capital flight and debt is suggested. The results of this analysis suggest the need to focus on capital outflow from RRDCs through transnational companies.

Keywords: Africa, Asia, capital flight, resource rich developing countries

1. INTRODUCTION

Countries with rich natural-resource endowment have experienced prolonged economic stagnation from the 1980s to the 1990s. Many studies on this paradoxical situation, named *resource curse*, have accumulated (e.g., Auty, 1990; Gelb and associates, 1988; Karl, 1997; Sachs and Warner, 1995, 2001). The focus of the resource-curse literature varies from Dutch disease (Corden and Neary, 1982; Corden, 1984; Cuddington, 1989), to economic volatility and policy pro-cyclicality (Budina et al, 2007; Nissanke, 2010), and rent-seeking activities, which represent the argument in the arena of political economy (Hausmann and Rigobon, 2003; Karl, 1997).

Sachs and Warner (2001) use 1970–1989 data and visually and clearly demonstrate the negative relationship between dependence on commodity exports and per capita economic growth rate, which has become one of the stylized facts of the resource curse. In fact, this same clear relationship cannot be replicated anymore with the data for the new millennium. Since 2000, many resource-rich developing countries (RRDCs) have been experiencing an influx of foreign direct investment (FDI) and higher resource revenue and continue to register rapid economic growth rates. Today, RRDCs appear to have overcome the resource curse and gained advantages that permit them to boost their own economies. However, it is also true that large populations in RRDCs still suffer from weak government institutions, immature financial systems, poor public infrastructure, high unemployment, and poverty, regardless of the extent of their resource incomes and their relatively high GDP growth rates (IMF, 2012).

This study investigates the influence of international resource price movements on capital outflows from RRDCs. One basic assumption of this study is that a large share

of resource revenue is not domestically invested but is simply consumed or flows abroad. Drawing on this premise, this study calculates the volume of capital outflows from RRDCs.

One reason for focusing on capital outflows from RRDCs is the similar characteristics between the capital-flight ridden countries and the resource-curse suffering countries. Noteworthy analyses on international capital movements have focused on capital flight, mostly during the 1980s–1990s when many developing countries (and private banks in developed countries) suffered from financial crises (Cuddington, 1986, 1987, 1989; Dooley et al, 1986; Dornbusch, 1985; Lessard and Williamson, 1987). These analyses offer great insight into and knowledge on the conditions for and causes of capital flight from heavily indebted countries. The main characteristics of countries that suffered heavy capital flight during this period include currency overvaluation, high inflation rate, financial repression, high risk associated with domestic assets, and above all, the inflow of foreign capital in the form of foreign debt.

The above characteristics of countries that suffered heavy capital flight in the 1980s also apply to RRDCs. In particular, many RRDCs experienced an influx of foreign capital in the form of resource revenues, especially in the new millennium when international resource prices increased. Because many developing countries share weak institutions and other economic characteristics, capital inflows as RRDCs' resource revenue are also suspected to be linked with capital outflows.

Another reason for focusing on capital outflows from the RRDCs is their paradoxical economic situation. While it is regarded as normal behavior for residents in

developed countries to hold their assets abroad or invest abroad to maximize their investment returns (Lessard and Williamson, 1987: 201), there are good reasons to believe that the increase in foreign asset holdings of RRDC residents is not entirely clear. Although a typical RRDC receives huge resource revenues, its domestic economies are still underdeveloped. More precisely, many RRDCs lack economic infrastructure, effective health care and education systems, and domestic jobs. In sum, many RRDCs are in need of additional domestic investment and possibly suffer from domestic capital shortage despite their rich cash inflow.

To further develop the discussion on capital outflows in the context of RRDCs, this paper distinguishes between capital *flight* and capital *transfer*. While both are considered as capital outflow, capital flight is interpreted as the increase in private foreign assets held by RRDC residents. Capital transfer, on the other hand, is the outflow of capital, of which ownership is transferred to the residents living outside RRDCs. In particular, this study focuses on the operation of private transnational companies (TNCs) in RRDCs as an important conduit of these capital transfers. Capital transfer is especially important in RRDCs because many TNCs operate within the natural resource industries and their influence on the local economy is historically large in many cases. As international resource prices increase, these TNCs are also expected to be influenced by the change.

The remainder of this paper is organized as follows. Section 2 reviews stylized facts on capital flight and summarizes the relationship between FDI and capital transfers to investigate how these factors affect resource-rich countries. Section 3 presents definitions for both capital flight and transfers from RRDCs and calculates their

volumes. Section 4 presents a panel-data analysis on the determinants of capital outflows using calculated data for 21 countries from 1990 to 2011. The final section concludes.

2. CAPITAL FLIGHT AND CAPITAL TRANSFER

(a) Capital flight

Capital outflows from developing countries became a subject of debate during the 1980s' Latin American debt crisis. A large portion of the foreign capital injected into crisis-ridden countries as development assistance or new loans is suggested to have "round-tripped" out of these countries into foreign bank accounts as private assets (Kant, 1996; Pastor, 1990). There is no formal definition of capital flight, and thus, the range of capital movement included as capital flight and its estimated values varies depending on a study's aims and methods (Ajayi, 1995). On one hand, capital flight can be understood as being rational profit maximization by the residents of developing countries, on the other hand, it can be regarded as a way these residents protect their assets from their local high-risk political and economic environment. These international capital movements can be either legal or illegal.

Several authors note the harmful effects of capital flight on the country losing this capital. For example, Cuddington (1986) and Pastor (1990) indicate that capital flight destabilizes the domestic interest rate and exchange rate, which weaken the effect of financial policies. Capital flight also accelerates inequality by distorting the distribution of wealth. In addition, it could erode the potential tax base and simultaneously reduce domestic investment.

Other literatures note that political and economic instability and sudden changes in

economic policy are the primary forces triggering capital flight. People also transfer their assets to overseas bank accounts, where the currency is more stable, when they see signs of high inflation or an overvalued exchange rate in their countries (Ajayi, 1995; Cuddington, 1986, 1987; Dornbusch, 1985; Lessard and Williamson, 1987; Pastor, 1990). Dornbusch (1985) also highlights that a large government budget deficit is sometimes followed by either higher taxes or seigniorage, which also accelerate capital flight. Furthermore, against the background of today's globalized environment, it is natural to expect investors to shift their assets abroad when the domestic financial sector is underdeveloped, thus failing to present attractive investment opportunities. A weak financial system also implies the absence of a legal system to protect depositors, which is another possible cause of capital flight. Moreover, corruption among politicians and high-profile government officers, who have relatively easier access to foreign currencies, can exacerbate capital flight. International development aid from other governments sometimes offers significant opportunities for capital flight because foreign lending is tantamount to a supply of foreign currency (Ndikumana and Boyce, 2011b: 66–67).

In addition to the above-mentioned causes of capital flight, such pull factors as higher overseas interest rates or the existence of tax havens and banks with a high degree of secrecy are also considered to be good incentives for capital flight (Walter, 1987, 1989).

The most important point of the debate on capital flight is that the inflow of foreign capital, whether debt or aid, is directly linked to capital flight. At first, some authors saw capital flight in the 1980s as a theoretical and conceptual puzzle. This was because capital flew out of capital-scarce (and thus presumably higher-return) developing

counties. However, capital flight from Latin American countries has attracted so much attention because private assets were accumulated by sacrificing the public sector whose liabilities increased. Put differently, public capital flowed in as debt, of which creditors were the residents outside the debtor country. This debt was then turned into the private assets of residents of the debtor country who did not compensate for their gains.

Examining present-day RRDCs, there is huge inflow of foreign capital, but this can be linked to capital outflows. Adding to this, the local economic and political situation is not very different from the capital-flight-ridden countries discussed above. Indeed, as Ndikumana and Boyce suggest, prices of natural resources such as crude oil are commonly denominated and transacted in U.S. dollars, and thus, sales profits as well as other natural-resource revenues, such as signing bonuses or royalties, can be sources of additional private foreign assets for those who have access to them (Ndikumana and Boyce, 2011b: 67–71). Moreover, if an RRDC is already experiencing an economic structural transformation through the Dutch disease, the economy has already become highly dependent on its natural resources while having let its other industrial sectors decline. This economic situation is even more likely to induce capital flight due to economic volatility and a high inflation rate, which are suggested as characteristics of resource-dependent economies (Budina and Wijnbergen, 2008; Nissanke, 2010). With the globalization of the financial services industry, it is not rare for even the residents of less-developed countries to hold private assets abroad. Today, it may seem to be anachronistic to simply criticize the outflow of private capital from developing countries. However, an increase in private foreign assets can still be considered harmful. Adding to the harmful effects of capital flight discussed above, in many RRDCs,

investment outside the resource sector is not booming, regardless of the high-GDP growth rate. Moreover, investment in the development of the resource sector is mainly carried out by the TNCs through FDI. Given the relatively high-international resource prices, resource revenues should have accumulated in RRDCs; however, the revenues have not been redistributed or reinvested within their domestic economies.

(b) Capital transfer

The agent of capital outflows from RRDCs is not only private individual resident, but also TNCs that are expected to play an important role. The ties between governments and TNCs are particularly strong in resource-rich countries, where resource extraction and the operation of natural resource industries are heavily dependent on advanced technologies and huge capital provided by TNCs. For instance, crude oil production in many former colonial countries was initiated by the foreign private companies which later become TNCs, in cooperation with the colonial governments. Indeed, these companies had waves of nationalization, and many international oil companies formed joint ventures with these governments (Jones, 2005: 213–214). Nevertheless, international resource companies remained very influential within RRDCs through the era of nationalization or confiscation until today. Karl (2007) pointed out that in the case of oil companies operating within RRDCs, these companies continue to generate huge profits from natural resource production.

It is worth noting that while the increase in foreign investment inflows to RRDCs is welcomed, the proportion of profits in the local economy is expected to be small (Auty, 2006; Ferguson, 2005, 2006). Moreover, in the value chain of energy products and minerals, natural resources that are exported out of host countries are largely

unprocessed, and the majority share of product value is outside of RRDCs. Thus, a large share of the profits that accrue to these natural resources is earned outside of RRDCs. For example, Nigeria, one of the major African crude oil exporters, depends on crude oil for more than 90% of its export earnings, but the country imports a large amount of gasoline and other fossil fuels that are processed abroad (National Bureau of Statistics Nigeria, 2011). This is partly due to Nigeria's lack of domestic refining capacity. But the policies of oil majors also matter. In general, it is more efficient and cost effective for TNCs to produce higher value-added products in a location where stable electricity is supplied, transportation is cheaper, and that is accessible to consumers.

While there is nothing wrong with this international corporate behavior in the context of corporate management and profit maximization, it is the reason why FDI in developing countries' extractive industries is less of a benefit to host countries, as suggested by Asiedue (2006). Because the higher value-adding processing phase takes place outside of RRDCs, little technology and knowledge is diffused to the host economy. Extractive industries in developing countries also have few forward or backward linkages to other industrial sectors, and as a result, investment in the resource sector does not spread to the other sectors of the local economy. Moreover, the industry is very capital intensive and, consequently, does not produce much local employment (Ross, 2012).

All of these characteristics of foreign investment in resource industries suggest that while TNCs are expected to earn profits as international resource prices increase, their earnings are less likely to be reinvested or distributed to the host economy but rather are taken back to their home country or to tax havens. In short, an increase in the

international resource price will increase capital transfers from RRDCs to the foreign private companies.

While this analysis focuses on capital transfers via private companies, it is noteworthy that these companies are also important conduits of capital flight from developing countries. For instance, Ajayi (1995) suggests the possibility of capital flight for tax evasion or avoidance. This activity seems to be common among not only private individuals but also among private enterprises and TNCs.

Indeed, TNC activity is deeply related to capital flight when it transfers taxable liquid assets for tax evasion or avoidance. Some literature suggests that the development of tax havens and city states—such as Hong Kong and Singapore as well as the City of London—which function as financial centers with tax breaks, are associated with increases in tax evasion and avoidance, sometimes through TNCs' use of shell companies (Otusanya, 2011; Shaxon, 2011; Walter, 1987, 1989). Tax evasion and avoidance are serious problems for industrialized countries that are the home base for most TNCs. Nevertheless, both the society and economy of the host countries are more seriously affected. Developing countries' legal systems are often not yet fully mature and there are many loopholes in corporate tax law. Meanwhile, capital outflow through transnational corporations for tax evasion or avoidance reduces the tax base for the developing country's government, which possibly retards socioeconomic development and impedes efforts to reduce poverty. In many RRDCs, such problems are more serious due to their economy's high dependence on TNCs and the profits that are earned through domestic natural resource production. For example, Otusanya (2011) points out such problems in Nigeria, where Chevron manipulated its accounts to avoid making tax payments on petroleum profits, and Halliburton used an affiliate company to avoid

paying taxes.

Transfer pricing is another way through which TNCs derive capital from RRDCs. It is suggested that TNCs charge minimum prices in their intra-firm trading to maximize overall profits within the group as a whole (Jones, 1995: 213). An extreme application of this type of transfer pricing is under-invoicing exports or over-invoicing imports. For example, under- and over-invoicing were commonly observed in Nigeria during the 1970s and 1980s (Morgan Guaranty Trust Company, 1986: 14). These mechanisms are also understood as a method of capital flight and a way to avoid paying taxes in the host country, thereby depriving it of a rightful source of revenue. But it is difficult to distinguish such transfer pricing as rational actions taken for profit maximization from questionable behaviors perpetrated for tax evasion or avoidance. Moreover, it is difficult to capture the size of such under- and over-invoicing because such transactions are embedded in current account balances on the trade of goods and services in the international balance of payment (BOP) statistics. Thus, capital flight through TNCs and capital outflows through the mechanism of transfer pricing are not dealt with in this paper.

3. ECONOMETRIC ANALYSIS

(a) Calculating capital flight

There are several traditional approaches to the estimation of capital flight in the literature. The most widely used approach is the “residual method,” proposed by Dornbusch (1985), and developed by others including Ndikumana and Boyce (2001). This method treats capital flight (KF1) as residual, meaning that it does not appear on the international payment balance, and uses BOP data accumulated by the IMF and debt

data accumulated by the World Bank. Capital flight is defined by the equation below.

Foreign reserves increase (ΔRes) + Current account deficit ($CA\ deficit$) + Long-term foreign investment outflow + KF1

$=$ New debt inflow ($\Delta Debt$) + Long-term foreign investment inflow. (1)

In this identity, long-term foreign investment consists of foreign direct investment (FDI) and portfolio investment (PI). Thus,

$$KF1 = \Delta Debt + (FDI + PI)net - (\Delta Res + CA\ deficit). \quad (2)^1$$

According to the "residual method," capital flight is estimated as the residual, which should be zero on an accounting basis when netting out net FDI, net Portfolio investment, new debt inflow, capital account deficit, and additional foreign reserves. Because most of the discussions in capital flight literature focus on the 1980s Latin American debt crisis, the assumption underlying this identity is that the countries are short of foreign reserves and run current account deficits, and are thus heavily indebted. If a country is running a current account deficit, then the shortage must be filled by FDI inflow, portfolio investment inflow, increasing international liabilities (borrowing), or the reversal of the existing foreign reserves. However, looking at the RRDCs analyzed in this study, especially since the new millennium, they are not typically running current account deficits owing to the high international resource prices.

Moreover, it should be noted that this estimation is asymmetric as it includes only the current account deficit and the increase in foreign reserves. Because of the

asymmetry, this definition produces ambiguity in the interpretation of the negative value for estimated capital flight. Negative FDI and portfolio investment inflows indicate that FDI and portfolio investments are withdrawn. This may contribute to negative capital flight estimates; however, this should not be simply regarded as a reversal of capital flight. Interpretation of negative capital flight estimates requires caution when there is a decrease in foreign reserves to fill the international payment gap.

Another strong assumption of the “residual method” is that foreign debt inflows in turn flow out of the debtor country, like a “revolving door,” as indicated by Boyce (1992). However, if a country earns a large resource windfall, the current account will be in surplus and the country will pay back the external debt so that the net debt transfer is negative, and foreign reserves may also somewhat increase. In such cases, the calculated capital flight can become negative, and again, this value should not be regarded as a reversal of capital flight. Drawing on the above observations, this analysis extends the “residual method.” That is, capital flight is symmetrically calculated as follows.

KF = net FDI + net portfolio + net debt transfer + CA balance + reserve change (either positive or negative). (3)

The assumption is that if a country runs a current account surplus, it will pay back its foreign debt and increase its foreign reserves, and there can still be capital flight. This assumption is based on the perception that there are increasing numbers of foreign bank branches, even in developing countries, and especially where transnational corporations operate for natural resource production (Jones, 1993). Owing to

accelerated financial globalization, it is getting easier for residents in developing countries to access foreign bank accounts. Figure 1 shows the size of capital flight for the 21 countries studied here. The list of the countries and the data sources used for the estimation are described in Appendix a and b.

It should be noted that this estimation does not consider the long-term interest that may accrue to foreign assets. Some authors, such as Hermes and Lensink (1992) and Ndikumana and Boyce (2003), focus on the stock of capital flight and estimate the amount of capital flight including accumulated interest. However, the weight of this analysis is more on the annual change in capital flight, and thus prefers to consider the simply calculated capital flight as the bottom line.

According to the estimation, the size and trend of capital flight for the period 1990–2011 significantly differs from those found in earlier studies, such as Ndikumana and Boyce (2003, 2011a) and Schneider (2003). For example, although the studied time period does not coincide, the estimated capital flight from Nigeria in Ndikumana and Boyce (2011a) shows a positive sign for almost whole period, while the current figure for capital flight takes a large, positive number only for some years. This applies to other countries and only a limited number of countries show consistent, positive capital flight throughout the entire sample period.

(b) Capturing capital transfer

The size and trend of the capital outflow from developing countries through foreign private companies have not attracted much academic attention. While little attempts have been made to estimate such values, it is difficult to determine the exact amount of companies' profit repatriation from any published data. This analysis uses

available statistical data to roughly speculate the size and trend of the capital that flows out of RRDCs through TNCs.

The amount of money earned by TNCs and thus taxed by host governments and then sent home is recorded as primary income debit, which appears in the Current Account section of the Balance of Payment statistics. This amount, by far, underestimates the extent of repatriated earnings of foreign companies, since most internationally operating companies use the system of transfer pricing and use other accounting techniques to avoid and reduce tax payment, as described in the previous section. Nevertheless, primary income statistics are one of the important proxies available to capture the TNCs' role as a conduit of international capital transfers.

Alternatively, secondary income debit is also added to the primary income debit to be more precise. While secondary income in the BOP includes workers' remittances, this amount is not large relative to the income earned by corporations, and thus the size and trend do not change much.

Figure 2 shows calculated capital transfer for the 21 countries studied here. Because the size of capital transfer strongly depends on industry type, the size of the host country's economy, and its relationship with former colonial countries, it is difficult to set a criterion with which one can judge whether the capital transfer is too large or within an acceptable range. Nonetheless, this figure helps shed light on the extent of TNC influence on host countries' economies.

Summary statistics of calculated capital flight and outflow is shown in Table 1. Some countries such as Azerbaijan in the late 2000s or Malaysia in 2008 show the large share of capital flight in GDP as around 20%, but the mean value of capital flight across the sample is negative. On the other hand, based on the estimation by Cuddington

(1987) for example, the capital flight from Latin American countries such as Argentina, Mexico, and Venezuela in the 1970s and 80s, is estimated to be around 20% to 25% of GDP on average. It is apparent that capital flight, on average, is not that serious as in Latin American countries in the 1980s. On other hand, the share of capital outflow in GDP is relatively larger. The countries with large capital outflow share are Guyana, Zambia, Nigeria, and Kazakhstan, ranging from 20% to 40% of GDP in several years. Comparing Figures 1 and 2 also shows that the average estimated size of capital transfer as a share of GDP is far larger than that of capital flight. This is noteworthy because, while historically capital flight has attracted academic interest, capital transfer has received less attention.

4. PANEL ANALYSIS

(a) Model

This section analyzes the determinants of capital flight and transfer using a time series panel. Of greatest interest to this analysis is the influence of international resource price movements on capital flight and transfer. The sample includes 21 RRDCs whose selection is based on their respective share of natural resource rent in GDP and data availability. The sample period is 1990–2011. Some data is lacking for several countries, making the panel unbalanced.

In this regression, the international resource price is substituted by a proxy. The international economic trend simultaneously affects all countries, and many resource price movements are correlated to each other. Using a common natural price variable for all countries as an explanatory variable will induce cross-sectional correlations, which lead to inefficient estimations (Avery, 1977). To circumvent this problem, the total

natural resource rent (NRR) is used as a proxy for international resource price. NRR is taken from the World Bank's *World Development Indicators* (WDI), and it is calculated as the difference between commodity price and average production cost, multiplied by production quantity (World Bank, 2011). Because NRR captures the quantity of resource production of the country by definition, the change in NRR should not be understood as simply equivalent to the price change. However, as shown in Figure 3, the movement of both NRR and natural resource price change are closely synchronized[2].

Ndikumana and Boyce (2003) point out that capital flight has characteristics of hysteresis and their estimation model includes a one-term lag for dependent variable. This analysis also attempts to follow their method. In the regression, to circumvent the unit-root process and serial correlation, capital flight is measured as a share of GDP and is differentiated because capital flight is a flow data, and thus takes both positive and negative values. On the contrary, capital transfer is also a flow data, but this is because this figure takes only positive values and is equivalent to the capital stock paid by the host economy to foreign corporations each year. Thus, the data for capita transfer is used as a form of natural log difference. Possibly because of this technical difference between capital flight estimation and capital transfer estimation, while the auto-regression model fits quite well for capital flight, the inclusion of a lag does not improve the fitness of the model for capital transfer estimation. Thus, the regression model is denoted as below.

$$KF_{i,t} = KF_{i,t-1} + NRR_{i,t} + X_{i,t} + \upsilon_{i,t}, \qquad (4)$$

$$KT_{i,t} = NRR_{i,t} + X_{i,t} + \eta_{i,t}\,. \qquad (5)$$

In equation (3), $KF_{i,t}$ is the size of capital flight previously calculated, and in equation (4), $KT_{i,t}$ denotes capital transfer captured by the definition described in the previous section. *X* is a vector of the macroeconomic indices explained below, and $v_{i,t}$ and $\eta_{i,t}$ are error terms. The explanatory variables such as *NRR* and the ones included in *X* are assumed to be exogenous to capital flight and capital transfer.

(b) Explanatory variables

The selection of explanatory variables here is based on capital flight literature as discussed below. Most of the data is taken from the BOP and the WDI. The detailed definition and data source is described in appendix c.

Public Debt Flow [DEBT]: If new capital inflows as foreign borrowing indeed induces and accelerates capital flight, as suggested by Dornbusch (1985), Cuddington (1987), Pastor (1990), and Boyce (1992), an increase in debt flow leads to an increase in capital flight (KF1). On the other hand, if this relationship does not apply, it suggests that the mechanism of the Latin American debt crisis is not universal, regardless of the similarities in the economic and political situations in RRDCs. While it is notoriously difficult to measure the amount of new debt transfer or flow, for technical reasons, the annual change rate of total debt stock including short-term debt is used. This figure includes publicly guaranteed debt as well as non-guaranteed private debt.

Natural Resource Rent [NRR]: When international price and resource revenue increase, NRR also increases. The increase in resource revenue means an increase in foreign capital inflows. If this capital is the source of additional foreign assets of RRDC

residents, the increase in NRR leads to increased capital flight. Also, a natural resource price increase should lead to higher profits for resource-extracting companies. If these TNCs are shifting profits out of RRDCs, the increase in NRR will lead to higher capital transfers.

Foreign Direct Investment inflow [FDI]: In the period studied, a large amount of FDI is directed to RRDCs' natural resource sector (World Economic Forum et al, 2011). Some RRDCs are indeed improving their investment climate and attracting more FDI, although investment in RRDCs is reported to be increasing regardless of political and economic risk within the host country's economies. This increased FDI inflows can be a reflection of the favorable local economic situation, which leads to a decline in capital flight. On the other hand, from the corporate side, the increased FDI must be linked to an increase in current or future profits, thus leading to an increase in capital transfers.

Inflation rate [INFLATION]: Drawing on Cuddington (1987) and Dooley (1988), this analysis includes the inflation rate as an explanatory variable, but not the real interest rate for data incompleteness. It is expected that the higher the inflation rate, the lower the real interest rate, and this will lead to capital flight. On the other hand, the influence of inflation on capital transfers is ambiguous because TNCs deal with foreign currencies, which are immune from the local currency's value fluctuations.

Oil Rent Share [OIL RENTS]: The problems of the natural resource curse are sometimes discussed in the context of crude oil producer countries and named as the "oil curse," because oil-producing countries tend to have more serious economic,

political, and social problems (Ross, 2012). To capture the special characteristics of oil countries, a dummy variable can be included. However, there is no simple criterion for an oil country. For example, Indonesia is indeed producing crude oil, but it is a net oil importer, and the economy is less dependent on oil production compared to other countries that produce an equivalent amount of crude oil. Thus, to capture an economy's dependence on crude oil production, the oil-rent share of GDP is employed instead of the dummy.

Africa dummy [AFRICA]: Some estimations on capital flight from African countries suggest the distinguishingly large size of capital flight from the natural resource-rich countries such as Nigeria (Boyce and Ndikumana, 2001; Ndikumana and Boyce, 2003, 2011a, 2011b; Schneider, 2003). The World Bank report in 1993 noted the huge capital flight from Latin America, adding that "…Sub-Saharan Africa stands much worse than Latin America and the Caribbean" (World Bank, 1993: 24). Furthermore, *World Financial Markets* issued by the Morgan Guaranty Trust Company also names Nigeria alongside South Africa in the list of the 18 worst-affected countries from capital flight (Morgan Guaranty Trust Company, 1986: 13). Thus, to capture African characteristics, the Africa dummy is included for the Sub-Saharan African countries.

There are several additional variables suggested to have an influence on capital flight in the literature. However, many of them (such as government budget deficit or GDP) are strongly correlated with the international price movement and resource revenue, and thus are avoided in this estimation. On the other hand, Cuddington (1986) and Pastor (1990) suggest that capital controls are effective in preventing capital

outflow. While capital controls influence the legal capital flow, the situation of capital controls is complicated, and thus, it is difficult to obtain a series of indices on capital control. Therefore, the existence of capital controls is not included in the regression. The summary statistics of the explanatory and dependent variables is shown in Table 2.

(c) Adequacy of the model and data

Macroeconomic analyses using panel data that consist of time series and cross-county data, in many cases, uses the fixed effect model to mitigate the bias caused by heterogeneity across the countries due to unobserved variables, such as technology, institution, culture, or geography (de Mello, 1999). This analysis includes fixed effects for each country, but the result of the F test failed to reject the null hypothesis that the inclusion of an individual fixed effect for each country is redundant, and thus the fixed effect model is not superior to the pooling model. Despite this result, and to control for country characteristics and for comparison, the estimation results of the fixed effect model are reported.

This analysis also decided to be cautious about the cross-section correlation. The interest variable and NRR movement are highly correlated across countries because they are affected by international price movements. To deal with this cross-sectional correlation, the seemingly unrelated (SUR) model is employed (Avery, 1977).

Country selection is based on a total natural resource rent that is greater than 30% of GDP, but the selection was strongly restricted to the available data. All countries are developing countries and the GDP scale and industrial structure greatly differ among countries. However, as mentioned above, these uncontrolled country characteristics do not seem to play a large role here. On the other hand, each variable is denominated by

GDP or converted to the growth rate to circumvent a heteroscedasticity bias or serial correlation, as long as the conversions do not affect the interpretation of the value. Moreover, the existence of panel-unit roots is tested using the Levin, Lin, and Chu test (LLC test) and Breitung test for a common unit root across the cross section (Levin et al, 2002; Breitung, 2000). For the variables used in the regression, both tests rejected the null hypothesis with the 1% significance level that the series have a unit root process (Table 3).

(d) Results

Table 4 shows the regression results of the fixed effect model, and Table 5 shows the results of the SUR model. In each model, a one-term lag of KF1 is large and statistically significant. This can be interpreted as the hysteresis of capital flight, but this can also be due to a weak serial correlation in KF1, even though the existence of the unit-root process is rejected by tests.

In the SUR model, NRR has a positive effect on capital flight and transfer, although in the fixed effect model, it is not statistically significant on capital flight. This result presents good reason to perceive a linkage between resource revenue and capital flight, but it is possible that some specific countries strongly affect the results. On the other hand, the positive effect of NRR on capital transfer implies that capital transfer increases as international resource prices and corporate profits increase, thus the linkage between the inflow of resource revenue and capital transfer also exists. While this is quite a natural result, the coefficient size is noteworthy, as discussed below.

DEBT has positive, significant effects on capital flight and transfer, but the fixed effect model does not support this result. Nevertheless, the results show that a linkage

between capital inflow as new foreign borrowing and capital flight still exists, as presented in the literature on Latin American debt in the 1980s. FDI has a negative effect on capital flight in both models, implying that in an economy that is sound enough to attract FDI, people do not feel the need to move their private assets abroad. The effect of FDI on capital transfer is positive and significant in both models.

Contrary to the capital flight literature, INFLATION has a negative sign in both models, but the coefficients are not statistically significant. This may be because, in resource-rich countries, higher resource prices and economic growth are inevitably associated with inflation. On the other hand, the effect on capital transfer is positive and statistically significant, suggesting that higher inflation is associated with accelerated capital transfers.

The oil resource rent share, OILRENTS, as an indicator of dependency on crude oil, is positive but it is only statistically significant in the regression on capital transfer in the SUR model. This can be interpreted to mean that oil countries' characteristics are not very different from those of other resource-rich countries, and thus the effect of the oil-rent share is captured by NRR.

Finally, SSA included in the SUR model has a positive sign in the capital flight estimation, although the statistical significance is on the border. Thus, the suggestion by some studies that capital flight from African countries is much more serious than from Latin American countries is weakly supported here. Contrarily, the Sub-Saharan Africa dummy has a negative sign for the capital transfer estimation. This suggests that the scale of capital transferred from Sub-Saharan African countries is less than that of other regions. However, it should be noted that, on average, the African countries have weaker legal and law enforcement systems, and thus, it is possible that much capital is

omitted from the figures declared as profits that are presented to the authorities.

While the equations are specified identically for both capital flight and transfer, the coefficient of NRR in the regression of capital transfer turns out to be much larger.

From the estimation results in Table 4 and 5, a 1% change in NRR increases capital flight as a share of GDP by about 0.027 to 0.035 percentage points on average. On the other hand, a 1% change in foreign debt increases on an average of about 0.1 to 0.18 percentage points of capital flight as a share of GDP. This can be interpreted that the borrowed capital inflow is more strongly related to the capital flight than earned capital inflow.

On capital transfer, a 1% change in NRR increases capital transfer by 0.29 to 0.33% on average. While the change in NRR should not be directly interpreted as a price change, there is a strong correlation between the two factors, and the international resource price is very volatile. For example, on an annual basis, between 1990 and 2011, the average annual crude oil price change rate was around 10%, but from 1999 to 2000, the crude oil price jumped about 60%. In this extreme case, with the production cost and quantity being equal, capital transfer from RRDCs is estimated to have increased by about 17 to 20%.

For comparison, the same set of explanatory variables is regressed on the real GDP growth rate and on gross fixed capital formation, to examine NRR's contribution. The regression results are shown in Table 6. From the results, a 1% change in NRR increased the GDP by only 0.02% in result (e) with SUR model. Moreover, the change in NRR did not contribute to gross domestic capital formation, namely to domestic investment. Comparing the contribution of NRR to each factor implies that capital

transfer increases steadily and proportionally to the international resource price change, while RRDCs' economies do not benefit from price change as much as foreign companies do.

5. CONCLUSION

This paper focuses on the capital outflow from RRDCs by calculating the amount of capital flight and transfer from these countries. It also analyzes the determinants of capital flight and transfer by using a macro panel data. Through the calculation of capital flight and outflow, it is suggested that capital flight from RRDCs are not as serious as the case of Latin American countries in the 1980s. The panel data analysis suggests that the argument of previous literature on capital flight and its linkage with public debt inflow still holds for the period 1990–2011. Changes in NNR as a proxy for international resource price has an explanatory power on changes in capital flight and transfer, and the effect of NNR on capital transfer is especially noteworthy.

The literature on capital flight has long discussed the domestic macroeconomic situation and the failure of economic policy or institutional flaws as the causes of capital flight. In other words, the causes of capital flight have been sought in capital-flight suffering countries. However, this analysis of the 21 RRDCs analyzed here suggested that the capital outflow through TNCs is much larger than capital flight. Although it is natural that certain amount of capital is transferred as returns to FDI, the amount and pace of capital transferred from RRDCs is greater and steadier than that at which resource revenues of RRDCs contribute to the domestic economies. Because many RRDCs' economies are dependent on FDI in their natural resource industries, large scale of capital outflow in the form of transfer to TNCs can be seen as a necessary evil

associated with economic development. Further study is needed to contribute to the literature regarding the extent to which capital outflows from developing countries are admissible, and the point at which they are considered excessive.

In recent years, international capital movement has substantially increased, and this change should also have affected the developing countries so that the mechanism of capital inflow to and outflow from developing countries should also have shifted. The analysis of this shift is a task for future analysis.

As the Asian experience shows, the roles and contributions of FDI for developing countries' economies are crucial, as those countries are capital scarce and in need of technology and investment. To prevent excess capital outflow, RRDCs' governments must provide conditions that attract domestic reinvestment. In other words, they must establish the rule of law and foster reinvestment in the non-mining sectors. TNC activities are expected to grow further in the future and their impact on developing countries' economies will also grow. This suggests the need to focus on the outflow of capital from RRDCs through TNCs.

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Notes

1. In the BOP data, foreign reserve increase is regarded as an equivalent of capital outflow, and thus, the figure is entered with a negative sign. Applying this BOP notation to equation (2), $KF1 = \Delta Debt + (FDI + PI)net + \Delta Res + CA$ deficit. In the latest BOP updates, data after 2005 are organized in accordance with the Balance of Payments and International Investment Position Manual, Sixth Edition (BPM6, IMF 2009). For estimation in this analysis, new BOP data is also utilized and signs are adjusted where relevant.
2. Among many metal and energy prices, crude oil prices are most strongly correlated to the total natural resource rent.

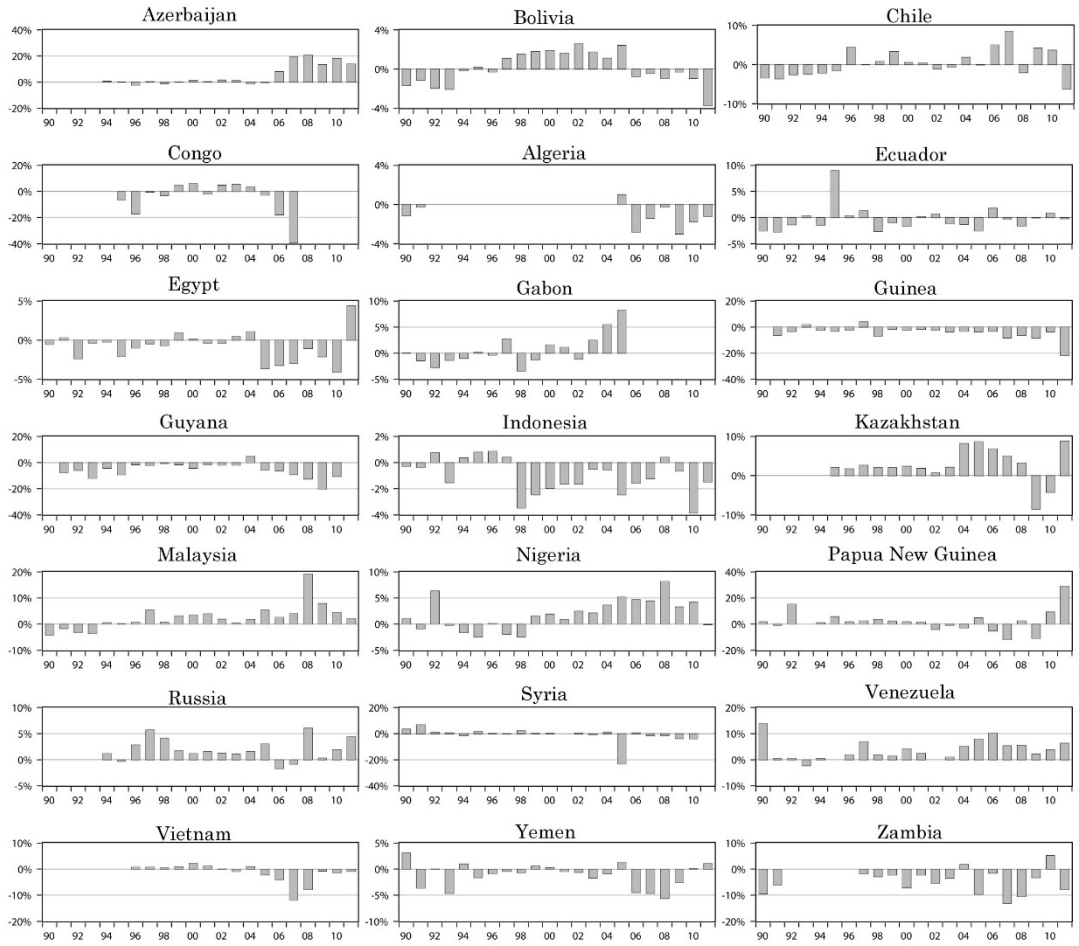

Figure 1. Capital flight (share of GDP)

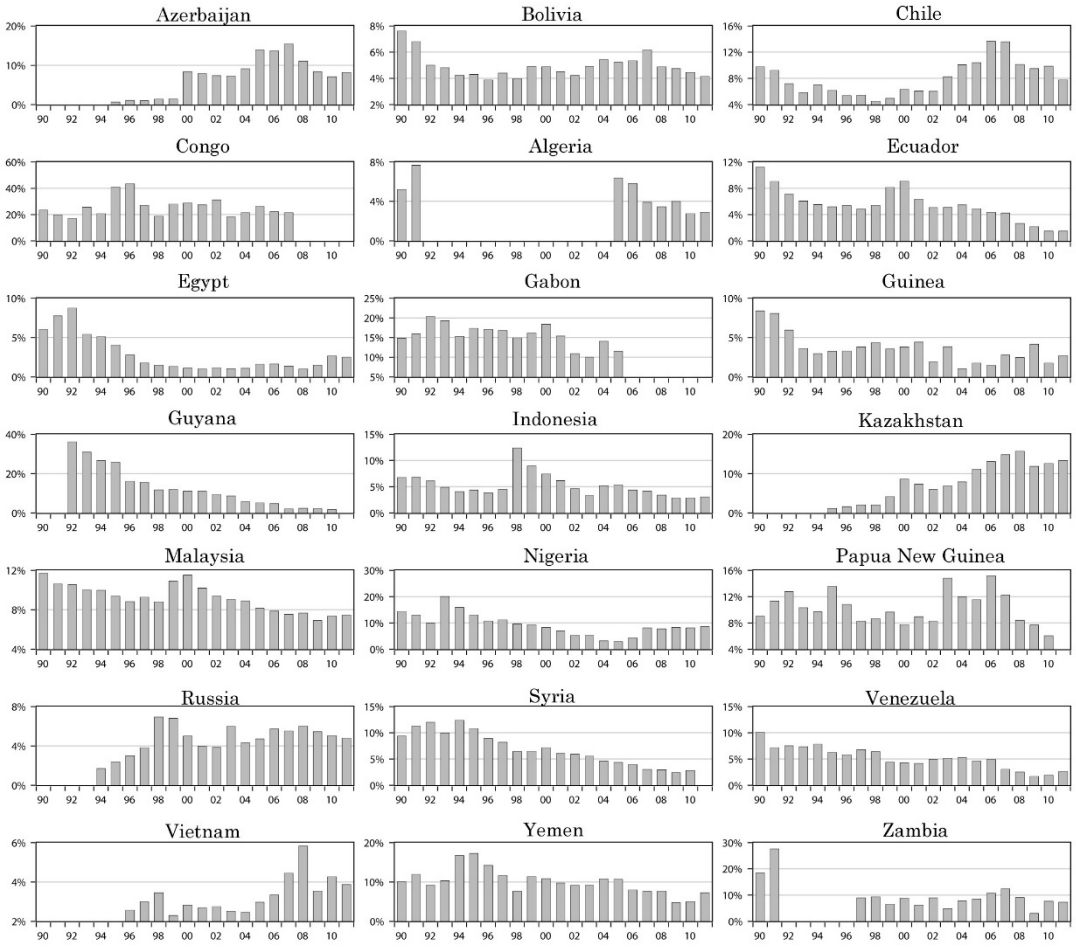

Figure 2. Capital transfer (share of GDP)

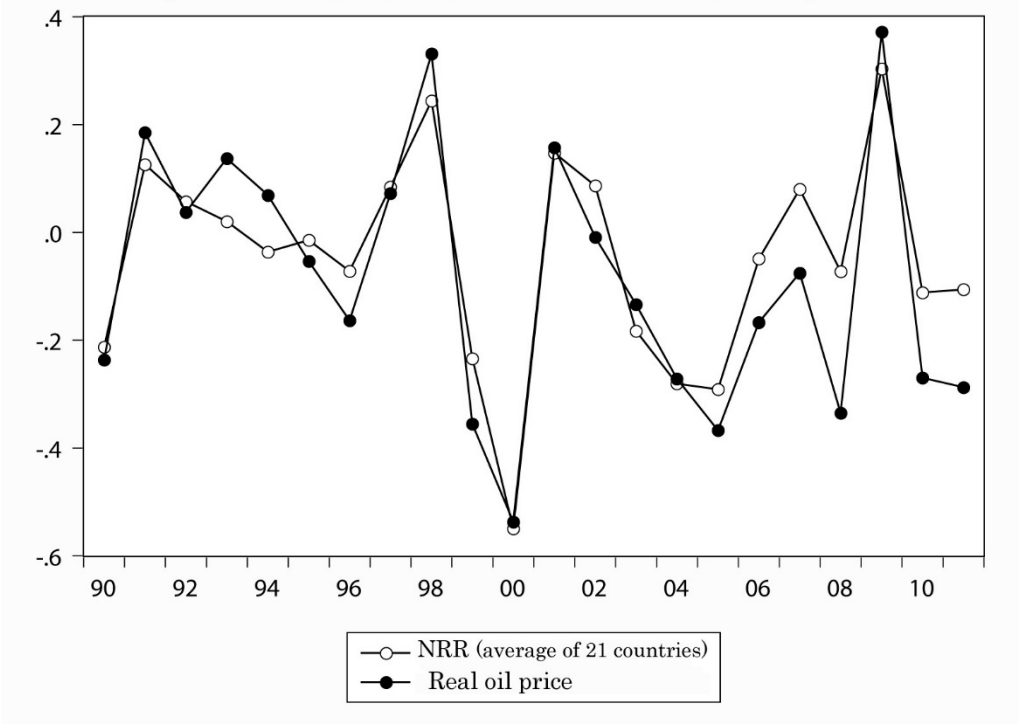

Figure 3. Natural Resource Rent and Real Oil Price (annual growth rate)

Source: World Bank (2013a).

Table 1. Summary statistics of capital flight and transfer as share of GDP

	Capital flight	Capital transfer
Mean	-0.0019	0.0796
Median	-0.0011	0.0678
Maximum	0.2059	0.4348
Minimum	-0.3911	0.0064
Std. Dev.	0.0530	0.0601
Observations	403	403

Table 2. Summary statistics of the panel data

	Mean	Standard deviation	Maximum	Minimum
KF1 (first difference of GDP share)	-0.003	0.111	0.608	-0.641
KT1 (log difference)	0.070	0.304	1.923	-1.237
KT2 (log difference)	0.088	0.306	2.029	-1.228
NRR (log difference)	0.052	0.268	1.137	-0.970
Debt (log difference)	0.007	0.175	0.648	-1.259
FDI inflow (log difference)	0.045	5.599	21.396	-22.475
Inflation	13.045	16.317	144.003	-23.479
Oil rent	16.282	15.796	75.708	0.000
SSA (dummy)	0.188	0.391	1.000	0.000

Table 3. Panel unit root test results

Series		Test common unit root	
		Levin, Lin and Chu[a]	Breitung[a]
KF	Level (constant US$)	-0.357	4.533
	GDP share	-2.200**	2.496
	First difference of GDP share	-15.332***	-2.218**
KT1	Level (constant US$)	-0.923	2.828
	GDP share	-3.161***	-2.522***
	Log difference	-14.006***	-7.609***
KT2	Level (constant US$)	-0.298	4.064
	GDP share	-3.207***	-2.787***
	Log difference	-12.740***	-8.240***
NRR	Level (constant US$)	-1.0877**	1.255
	GDP share	-3.850***	-1.080
	Log difference	-12.770***	-4.340***
Debt	Level (constant US$)	0.102	3.765
	GDP share	-4.174***	0.308
	Log difference	-14.814***	-4.213***
FDI	Level (constant US$)	-1.254	1.1417
	GDP share	-4.407***	-3.122***
	Log difference	-14.836***	-2.346***
Inflation	Percentage from ba	-39.226***	-6.067***
Oil rent	GDP share	-4.989***	-3.882***

a. Both unit root tests include individual intercept and trend. Lag lengths are selected according to the Schwartz Information Criterion.

** and *** denotes 5% and 1% level significance, respectively.

Table 4. Determinants of capital flight and transfer: fixed effect model.

	fixed effect model					
	(1)	(2)	(3)	(4)	(5)	(6)
	KF	KF	KT1	KT1	KT2	KT2
C	-0.0029	-0.0230	0.0198	-0.0292	0.0480**	-0.0129
	(0.0062)	(0.0185)	(0.0196)	(0.0478)	(0.0201)	(0.0490)
KF(-1)	-0.3714***	-0.3936***				
	(0.0517)	(0.0526)				
NRR	0.03480	0.0295	0.3093***	0.2929***	0.2732***	0.2541***
	(0.0212)	(0.0221)	(0.0552)	(0.0587)	(0.0568)	(0.0602)
DEBT	0.1779***	0.1364***	0.0217	0.0560	-0.0413	-0.0041
	(0.0332)	(0.0358)	(0.0852)	(0.0922)	(0.0877)	(0.0946)
FDI	-0.0037***	-0.0024**	0.0053**	0.0057**	0.0027	0.0036
	(0.0010)	(0.0010)	(0.0025)	(0.0026)	(0.0026)	(0.0027)
INFLATION	-0.0001	-0.0001	0.0026**	0.0024**	0.0019*	0.0017
	(0.0002)	(0.0002)	(0.0010)	(0.0010)	(0.0011)	(0.0011)
OILRENTS		0.0012		0.0032		0.0039
		(0.0011)		(0.0028)		(0.0028)
N	374	370	386	383	386	383
R-squared:	0.2346	0.2008	0.1923	0.1959	0.1541	0.1632

a. Standard errors in parenthesis.
*, **, *** denotes 10%, 5%, 1% level significance, respectively.

Table 5. Determinants of capital flight and transfer: SUR model.

	SUR Model					
	(1)	(2)	(3)	(4)	(5)	(6)
	KF	KF	KT1	KT1	KT2	KT2
C	-0.0003	-0.0034	0.0121	-0.0009	0.0433***	0.0376***
	(0.0029)	(0.0042)	(0.0083)	(0.0109)	(0.0108)	(0.0124)
KF (-1)	-0.4133***	-0.4292***				
	(0.0407)	(0.0441)				
NRR	0.0267***	0.0291***	0.3348***	0.3302***	0.2685***	0.2723***
	(0.0073)	(0.0081)	(0.0193)	(0.0194)	(0.0256)	(0.0263)
DEBT	0.1518***	0.1079***	0.1417***	0.1827***	0.0838**	0.1191***
	(0.0148)	(0.0160)	(0.0312)	(0.0321)	(0.0378)	(0.0393)
FDI	-0.0028***	-0.0018***	0.0047***	0.0051***	0.0030***	0.0038***
	(0.0004)	(0.0004)	(0.0008)	(0.0009)	(0.0009)	(0.0010)
INFLATION	-0.0001	-0.0001	0.0020***	0.0019***	0.0019***	0.0019***
	(0.0001)	(0.0001)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
OILRENTS		0.0003		0.0011**		0.0003
		(0.0002)		(0.0005)		(0.0005)
SSA	0.0140*	0.0096	-0.0620***	-0.0662**	-0.0714***	-0.0612***
	(0.0074)	(0.0074)	(0.0232)	(0.0261)	(0.0177)	(0.0218)
N	374	370	386	383	386	383
R-squared:	0.5197	0.4306	0.5716	0.5847	0.3440	0.3410

a. Standard errors in parenthesis.
*, **, *** denotes 10%, 5%, 1% level significance, respectively.

Table 6. Regression results on real GDP and gross fixed capital formation (GFCF)[ab]

	fixed effect model				SUR model			
	(a) Real GDP	(b) Real GDP	(c) GFCF	(d) GFCF	(e) Real GDP	(f) Real GDP	(g) GFCF	(h) GFCF
C	0.0672***	-0.0831***	0.0669***	0.0034	0.0765***	0.0574**	0.0682**	0.0599**
	(0.0075)	(0.0222)	(0.0097)	(0.0287)	(0.0062)	(0.0072) *	(0.0060) *	(0.0097) *
NRR	0.0438	-0.0135	-0.0086	-0.0327	0.0202**	0.0042	-0.0143	-0.0165
	(0.0274)	(0.0273)	(0.0333)	(0.0346)	(0.0088)	(0.0104)	(0.0157)	(0.0157)
DEBT	-0.0191	-0.0188	0.0180	0.0251	0.0018	-0.0096	0.0445**	0.0417*
	(0.0327)	(0.0324)	(0.0430)	(0.0428)	(0.0063)	(0.0080)	(0.0224)	(0.0225)
FDI	0.0025*	0.0032***	0.0020	0.0020	0.0022***	0.0026**	0.0018**	0.0017**
	(0.0013)	(0.0012)	(0.0015)	(0.0015)	(0.0003)	(0.0003) *	(0.0006) *	(0.0006) *
INFLATION	-0.0002***	-0.0000	-0.0001	-0.0001	-0.0001***	-0.0001**	-0.0002**	-0.0002**
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0000)	(0.0000) *	(0.0001) *	(0.0001) *
OILRENTSS		0.0089***				0.0011**		0.0004
		(0.0013)		(0.0016)		(0.0002) *		(0.0004)
SSA					-0.0197***	-0.0230**	0.0219	0.0242
					(0.0040)	(0.0051) *	(0.0200)	(0.0202)
N	432	428	314	314	432	428	314	314
R-squared	0.0711	0.1846	0.0868	0.1036	0.2444	0.3116	0.0736	0.0716

a. Standard errors in parenthesis.

b. Dependent variables are in log difference form.

*, **, *** denotes 10%, 5%, 1% level significance, respectively.

Appendices

Appendix a. List of the countries included in the sample

Algeria	Gabon [a]	Papua New Guinea
Azerbaijan	Guinea [a]	Russia
Bolivia	Guyana	Syria
Chile	Indonesia	Venezuela
Congo [a]	Kazakhstan	Vietnam
Ecuador	Malaysia	Yemen
Egypt	Nigeria [a]	Zambia [a]

a. Categorized as Sub-Saharan African country in the analysis.

Appendix b. The data sources used for estimation of capital flight and transfer

Data	Definition	Source
FDI	Net of foreign direct investment inflow and outflow, current US$.	Balance of payment (IMF)
Portfolio investment	Net of portfolio investment inflow and outflow, current US$.	Balance of payment (IMF)
Debt transfer	Total change in external debt stocks, current US$.	International debt statistics (World Bank)
Capital account balance	Balance on goods, services and incomes.	Balance of payment (IMF)
Foreign reserve change	Annual change of reserved asset	Balance of payment (IMF)
Primary income debit	Primary income, total debit, current US$.	Balance of payment (IMF)
Secondary income debit	Secondary income, debit, current US$.	Balance of payment (IMF)

Appendix c. The data sources used for the panel estimation

Data	Definition	Source
KF1	Calculated as described in the text. Converted to constant US$.	---
KT1	Calculated as described in the text. Converted to constant US$.	---
KT2	Calculated as described in the text. Converted to constant US$.	---
NRR	Total natural resource rent in level is calculated by multiplying the original data (% of GDP) with constant GDP.	World Development Indicators (World Bank)
DEBT	External debt stocks, total. Original data in current US$ is converted to constant US$.	International debt statistics (World Bank)
FDI	Foreign direct investment, net inflows in reporting economy. Converted to current US$.	International debt statistics (World Bank)
INFRATION	Inflation, consumer prices (annual %).	World Development Indicators (World Bank)
OILRENTS	Crude oil rent share in GDP.	World Development Indicators (World Bank)
SSA	Dummy. If Sub-Saharan African country, 1, otherwise, 0.	---