Kidnapping Rate and Capital Flight: Empirical Evidence from Developing Countries

Abstract

This paper contributes to the literature on capital flight by investigating the relationship between kidnapping rate and capital flight in developing countries. Numerous empirical studies exist on the determinants of capital flight but, surprisingly, none of them have investigated the empirical link between kidnapping and capital flight. To fill this existing void in the literature, this paper utilised a sample of 67 developing countries for the period 2003-2017. Estimates of the GMM technique show that kidnapping rate has a positive and significant impact on capital flight. However, estimations of the marginal differences show that this significant effect remained consistent only in the sample of 'fragile' developing countries. The results remained consistent to alternative measures of capital flight.

KEYWORDS: Kidnapping; Capital Flight; Capital Flow; Developing Countries; Fragile Countries
JEL Classification: F2, F21, O10

1. Introduction

In developing countries, kidnapping is relatively a common occurrence (Fink and Pingle, 2014), and, unfortunately, in those countries, kidnapping for ransom has become a global industry with recorded incidents running into tens of thousands each year (Stubbert et al. 2015). Incidents of kidnapping in the developing countries under review increased by 179% from 2003 to 2017 (UNODC, 2020). The adverse impact of kidnapping ranges from psychological and physical effects (Alexander and Klein, 2009) to severe economic consequences (Vergara, 2012; Munshi, 2019). This study's interest is the economic consequences of kidnapping in developing countries. One of the ways to capture this potential economic consequence is to look at capital flight. Capital flight is a source of serious concern for developing countries given the importance of external capital inflow in filling the domestic savings gap and supplementing domestic investments. There are numerous studies that have investigated the determinants of capital flight (e.g., Boyce, 1992; Gibson and Tsakalotos, 1993; Leblang, 1997; Collier et al. 2004; Ndikumana and Boyce, 2011; Brada et al. 2013; Ellyne and Mbewe, 2015; Muchai and Muchai, 2016; Ramiandrisoa and Rakotomanana, 2016; Salandy and Henry, 2018). These studies often conclude that external debt, taxation, political regimes, economic liberalisation, and measures of economic performance influence capital flight.

In the literature that is related to this paper, some empirical studies have investigated the relationship between terrorism and/or general political instability on capital flight (see, Alam and Quazi, 2003; Fielding, 2004; Efobi and Asongu, 2016; Shahzad and Qin, 2019; and Asongu et al. 2019). However, our study differs from these existing studies by focusing instead on crime. Although similarities exist between crime and terrorism, there are specific and significant differences that still exist between the two (Hutchinson and O'malley, 2007; Shelley and Melzer, 2008; Mullins, 2009). While crime is mainly motivated by material and economic gains, terrorism is ideologically driven and motivated by a desire for political and cultural change (Bovenkerk and Chakra, 2005). For this study, crime was captured with the kidnapping rate in the developing

countries under study. There are several rational arguments that have been provided to support the channels through which the associated effects of kidnapping may accelerate capital flight. Unsafe environments associated with high rates of kidnapping can dissuade wealth owners from investing in such countries (Carboni and Detotto, 2016). There is also the potential that continuous incidents of kidnapping can create a negative shock on wealth by disrupting labour market outcomes. Furthermore, trust and social cohesion are very important for investment activities. However, kidnapping can erode those, thereby deterring the needed investments necessary to sustain capital inflows or accumulate existing stocks of capital (Robles et al. 2013).

Therefore, the central question for this paper is, does kidnapping accelerate capital flight in developing countries? It is quite surprising that existing studies on the determinants of capital flight have yet to answer this question. Thus, this is the primary motivation of this study and three main contributions were deduced from this. First, we showed new evidence of the negative consequences of kidnapping. This new evidence we have shown in this study, will help extend and deepen what is already known of how kidnapping impedes on economic activities, particularly, for developing countries. Second, our study is extended by estimating the marginal differences on the impact of kidnapping on capital flight based on country 'fragility'[1]. There is an existing argument that the consequences of adverse incidents, like terrorism, political instability, and crime, may affect countries differently based on their levels of 'fragility' (Essaddam and Karagianis, 2014; Tingbani et al. 2019). Third, these new findings will provide policymakers in developing and 'fragile' countries with a much stronger evidence of the importance of well-functioning institutions and the need to adopt appropriate steps that can help cushion the negative impact of kidnapping. To help answer our main research question and to fill this existing void in the literature, we employed a sample of 67 developing countries for which data on kidnapping rate were reasonably available over the period 2003-2017. The results of the GMM estimations showed that kidnapping rate was

[1] 'Fragility' is a broad term associated with countries in which their governments are no longer able to control every part of their territories.

positive and significant to capital flight. An increase in kidnapping rate by 1 per 100,000 of the population would increase capital flight by a 1.3652 percentage point of GDP. However, the significant effect of the relationship between kidnapping rate and capital flight was only sustained in the group of 'fragile' developing countries.

The rest of the paper is structured accordingly. Section 2 presents a review of the literature on the potential channels through which kidnapping or, generally, crime can affect capital flight. In section 3, the sample and data will be presented. Section 4 presents the empirical strategy. The results are discussed in section 5. The final section concludes the paper.

2. Brief Review of Literature and Hypothesis Development

Developing countries are believed to be confronted with the problems of high levels of capital flight. Although the problem of capital is of global concern, it is believed to be more severe in developing countries (Ndikumana and Boyce, 2002; Collier et al., 2001). This shows that there is a variation on the level of capital flight, and a scholarly consensus seems to attach this variation to numerous macroeconomic and political uncertainties in developing countries. These uncertainties could present a catalyst for the acceleration of capital flight because rational investors are likely to move their investment to safe havens (Carboni and Detotto, 2016). Crime is one of the major obstacles or uncertainties facing developing countries. On a macro level, crime impacts negatively on international economic relations, and on a micro level it is a direct attack on safety and public order (Brown, 2001). Furthermore, it impacts negatively on productive activities, increases the cost of doing business, discourages private entrepreneurs, and represents a threat to property and life (Pinotti, 2015; Enamorado et al. 2014).

From a theoretical lens, these two theories – *institutional theory* and *investment diversion thesis* – can be used to explain some of the determinants of kidnapping in developing countries. According to the

institutional theory, institutions exist to maintain order and reduce uncertainty across economies. This argument is supported by North (1992) and Roxas and Chadee (2011), whereby they opined that institutions are designed to maintain order and reduce uncertainty, thereby making the environment less expensive. However, this is not always the case especially in developing countries. Hence the persistence of social vices such as kidnapping and other forms of crime. Also, the *investment diversion thesis* posits that, due to the better investment opportunities and macroeconomic stability in developed countries (Forgha, 2008), some bureaucrats and public officials in developing countries corruptly transfer stolen funds abroad. Such an illegal transfer of funds reduces investment in developing countries and affects the availability of financial capital. In the long run, this leads to a high level of unemployment. Studies have shown that a high level of unemployment in developing countries has been one of the major determinants of kidnapping (Ugwuoke, 2011).

On an empirical level, there is a dearth of studies, or none at all, that has investigated the relationship between kidnapping and capital flight. Thus, our empirical review of the literature would discuss, generally, some of the negative effects of crime on investment. In their study, Daniele and Marani (2011) showed that organised crime such as kidnapping and an organised mafia were disincentives to investment in the Southern region of Italy. Their argument is that crime in the region reduced its attractiveness. Ganau and Rodriguez-Pose (2017) also showed that organised crime negatively affected firms' productivity growth. According to their study, crime reduces trust among people, hinders competitiveness, weakens the established local industrial structure, and harms the existing market relationships among local firms. All of which increases the cost of business operations. Ashby and Ramos (2013) also found that the impact of crime, as captured by the homicide rate, had a negative relationship to investment in financial management and real estate services. Pearlman (2014) also found out that crime, such as robbery and extortion, reduced income growth among microenterprises in Mexico. Their findings were attributed to the fact that crime serves as a disincentive for investment. Cabral et al. (2016) also investigated the effects of drug-related crimes on labour productivity across 32 sub-national entities of Mexico.

Their study concluded, overall, the negative and statistical effect of crime on labour productivity. One of the arguments provided in support of the findings is that crimes are associated with panic, which could have a negative impact on economic activity through the temporal or permanent closures of businesses and other related activities. The negative impact of crime in South Africa was also emphasised in a study by Moyo (2002). Theft, robbery, arson, and vandalism had a negative impact on the activities of firms.

Argumentatively and in support of the empirical literature, there are other plausible reasons to expect a positive relationship between kidnapping and capital flight in our study. Incidence of crime can accelerate the capital flight by inhibiting the accumulation of physical and human capital stock including, distorting the economic system, and increasing the uncertainty of the business environment. As a result, there is likely to be reductions in profitability, returns on investments, and growth in economic activities. The prevalence of crime also increases the cost of doing business and can lead to market inefficiencies, economic distortions, business failures, and as a result, viable businesses and economic activities may relocate to safer countries (Yepes et al. 2015; Brown and Hibbert, 2017). All these are likely to increase the rate of capital flight from a country by disincentivising investors (Brown and Hibbert, 2019). There is also the psychological effect associated with crime that can influence the investment decision-making of owners of wealth thereby, reducing their willingness to adding to their stock of capital investment and thus, resulting to an increase in capital flight (Robles et al. 2013). Finally, sound financial institutions are important determinant in the accumulation of capital. However, financial institutions will be adversely affected if investors attach significant risks to the financial market due to the prevalence of crime.

H1: There is a positive relationship between kidnapping and capital flight in developing countries

The impact of kidnapping may not be the same across countries. For example, in 'fragile' countries, there is a sustained degradation of the preconditions relevant for markets to exist. This also includes the absence of strong institutions and governance structures (Fligstein, 2001; Rotberg, 2003). Such countries will find it difficult to deal with incidents of kidnapping and the associated aftereffects. Thus, the argument of there being a different and more accelerating effect of kidnapping on capital flight in 'fragile' countries is somewhat justifiable. Some studies have established similar lines of arguments on the effects of political instability in 'fragile' countries. Reade and Lee (2012) showed that businesses operating in terror-endangered areas, particularly 'fragile' countries, were more likely to face challenges from the organisational commitment of their workforce compared to their counterparts that were operating in less terror-endangered areas. Tingbani et al. (2019) also showed that the effect of terrorism on business failure was more apparent in 'fragile' countries.

In addition to the above empirical arguments, 'fragility' will hamper the ability of countries to sustain and accumulate capital because their competitiveness as destination countries for capital inflow is weak. There is also a tendency that criminal activities in such countries can be exacerbated due to their weak institutions and if this creates serious market distortions, can affect economic activities such as the demand for goods and services. Such crowding out of economic activities and the presence of weak institutions to cushion the effects of crime can make fragile countries more susceptible to capital flight (Brown and Hibbert, 2017). Furthermore, capital flight in 'fragile' countries is likely to be more due to the associated political and expropriation risks that characterise them. Such risks greatly reduce the confidence investors and owners of wealth have in such countries and their government (Benton, 2017). Finally, 'fragile' countries suffer more from inappropriate fiscal, political, and social policies which reduce their international competitiveness as destination environments for investment and accumulation of capital. They are often unable to sustain investments or maintain their attractiveness to investments due their weak institutions and poorly implemented policies. Thus, all things being equal, such countries are more likely to record

capital flight when crime is prevalent (McCloud and Delgado, 2018). Given the above argument and supporting studies, we hypothesise as follows:

H2: The impact of kidnapping on capital flight will be more in 'fragile' developing countries

3. Sample and Data

3.1 Sample Construction

The data for this study were collected from the World Bank Development Indicators (WDI) and the United Nations Office on Drugs and Crime (UNODC). The data collected were for developing countries for which the data for the main independent variable was available. In all, a total of 67 countries were employed for the analysis. Furthermore, the sample was disaggregated into 'fragile' (21 countries) and 'less fragile' (46 countries) developing countries[2]. These fragile countries are known for high levels of insecurity, and in our sample, they contribute approximately to 90% of the total number of kidnapping incidents. This category has also been adopted by other studies (see, Okafor and Piesse, 2017 and Tingbani et al. 2019). Therefore, disaggregating the data would allow for the estimation of marginal differences on the impact of kidnapping on capital flight. The period 2003-2017 was employed for the analyses and this was guided by the availability of data. For some of the main variables, the data before 2003 and after 2017 were not available. The sample of countries used in the study is presented in table 1.

INSERT TABLE 1

3.2 Variable Description

[2]See the FSI, 2019 report for fragile countries' ranking.

a. Dependent Variable

Capital flight (% of GDP) was used as the main dependent variable for this study. Capital flight refers to the outflows of private capital from a country in a given period of time (Davies, 2011). As with most studies (e.g., Alam and Quazi, 2003; Al-Fayounmi et al. 2012), and with a measure that can be easily measured and obtained, we adopt the World Bank (1985) measure of capital flight. This measure is known as the indirect approach and sums the change in external debt and inflows of foreign direct investment, and then subtracts the current account deficit plus the increase in official reserves (Fedderke and Liu, 2002; Alam and Quazi, 2003)[3]. The rationale for the indirect approach is that the increases in indebtedness and foreign direct investment are used to finance either the current account deficit or the official reserve accumulation. Thus, any shortfall is viewed as private foreign asset accumulation, which is associated with capital flight. Particularly, for developing countries, the argument for using the indirect approach is because of the associated problems with using the short-term changes in foreign assets (direct approach) in capturing capital flight. The direct approach looks at capital flight as the changes in the foreign assets of domestic residents, and, thus, changes in short-term foreign assets can then indicate capital flight. However, the direct approach is often criticised because unrecorded capital outflows are not captured in this way, and because no clear difference exists between long-term and short-term investments (Eggerstedt et al. 1995).

Nevertheless, it is important to subject our analysis to some robustness tests. Thus, given the argument on the shortcomings of using short-term assets, we computed the direct approach of capital flight using the change in the sum of the foreign assets (not short-term) of private banks. More so, data for short-term assets by the banking system cannot be easily obtained. The direct

[3] Mathematically, this is denoted as
capital flight = change in external debt + foreign direct investment inflows – current account deficit – change in foreign reserves.

approach assumes that private banks do not engage in capital flight, and, thus, changes in foreign assets should be excluded (Alam and Quazi, 2003)[4].

b. Main Independent Variable

The main independent variable was the number of kidnapping incidents. According to the UNODC, kidnapping is the unlawful detainment and taking away of a person against their will for the purpose of demanding an illicit gain or material benefit for their liberation, or in order to oblige someone to do or not to do something. However, to allow for consistency, appropriate scaling, and better comparability across countries, the number of kidnapping incidents was normalised per 100,000 of population (kidnapping rate).

c. Control variables

The study also employed some of the control variables known in the literature that can influence capital flight. In this study, we adopt some of these variables and they include volatility in GDP growth rate, inflation, a measure of the availability of natural resources, trade openness, foreign aid, savings, and real exchange rate. The literature lacks a theoretical framework that guides the empirical modelling of capital flight and crime. Therefore, our study is guided by some of these exogenous variables, as mentioned above, that the existing studies on capital flight and terrorism/political instability have adopted (see, Lensink et al. 2000; Alam and Quazi, 2003; Efobi and Asongu, 2016).

Developing countries are known for their high growth volatility (Easterly et al. 2000; Sheng, 2010), and this has significant implications on different macroeconomic factors (Ahamada and Coulibaly, 2011; Lin and Kim, 2004). Volatility in growth creates macroeconomic instability (Ahmed and Suardi, 2009), and this can discourage investors from taking advantage of investment opportunities

[4] Mathematically, this is denoted as
capital flight = change in external debt + foreign direct investment inflows – current account deficit – change in foreign reserves – change in foreign assets of private banks.

in the domestic market, thereby accelerating the rate of capital flight (Duman et al. 2005). Similarly, high levels of inflation can accelerate capital flight by making the assets denominated in the local currency to be less attractive in comparison to those denominated in a foreign currency (Ndikumana and Boyce, 2003). Furthermore, inflation is seen as a sign of the deterioration of the local currency, which leads to an increase in the expected return to, and the demand for, foreign currency. The overall effect is, therefore, an increase in the risk of investment, less of a desire of holding domestic financial assets, and subsequently capital flight (Harrigan et al. 2002). The availability of natural resources, which is captured in our study with oil rents (% of GDP), can reduce capital flight by providing a vehicle for rent-seeking foreign capital inflows. Although, natural resources may also accelerate capital flight if the revenue from natural resource exploitation is used to finance capital flight (Kwaramba et al. 2016; Ndikumana and Sarr, 2019). Trade openness is also known as an important determinant of capital flight, particularly with practices such as transfer pricing and mis-invoicing of exports and imports (Aizenman and Noy, 2009; Efobi and Asongu, 2016; Asongu and Amankwah-Amoah, 2016).

Foreign aid can positively influence capital flight (Ndikumana and Boyce, 2003) by facilitating the foreign exchange needed for the liquidity in support of capital outflow. In addition, an increase in foreign exchange, due to the inflows of foreign aid, can lead to the appreciation of local currency. However, this is likely to be in the short-run, which is, thus, not sustainable in the long-run. Residents may, therefore, switch out of domestic assets because of an anticipation of an eventual depreciation of the local currency. Finally, there is also the possibility of a 'crowding out' effect that pushes domestic capital abroad, since foreign aid finances many investments projects that are linked abroad (Alam and Quazi, 2003; Quazi, 2004). Savings can help an economy to overcome a low-growth trap by increasing the availability of the financial resources needed for productive domestic investments (Ndikumana, 2014). Thus, with productive domestic investments, wealth owners would be less inclined to move their assets abroad. Furthermore, increases in savings will broaden the capital and money markets, which provide wealth owners with a variety of financial

instruments, thereby reducing capital flight (Ajayi, 2000). The devaluation of the local currency is rationally expected to lead to capital flight. This is because currency devaluation often follows with an erosion of the domestic assets with respect to foreign assets and welfare losses for wealth owners (Alam and Quazi, 2003; Hermes et al. 2002). The variable category and description are presented in table 2.

INSERT TABLE 2

3.3 Summary Statistics

The summary statistics are presented in table 3. At the mean, capital flight (% of GDP) is 8.8062. In real terms, this is USD6.08 billion. The maximum value is 117.5610 (% of GDP) while the minimum is –65.5455 (% of GDP). Based on the percentiles, 75% of the sampled countries have capital flight (% of GDP) that is less than 15.5556 (% of GDP) (USD4.70 billion). The direct approach of capital flight, which is the alternative measure for the dependent variable, is 6.4829 % of GDP (in real terms USD3.24 billion) at mean, and in 75% of the sampled countries, this was below 14.7361 (% of GDP). These figures for capital flight are quite high, considering the fact that the countries under study are developing ones. With respect to kidnapping, the countries in the sample recorded an average of 1.5417 (per 100,000 of population). However, 25% of the countries in the sample recorded less than 0.1460 (per 100,000 of population). Similar interpretations hold for the control variables. In table 4 are the correlation coefficients of the variables used. From the correlation outputs, there appears not to be any concerns from potential multicollinearity issues.

INSERT TABLES 3 & 4

4. Empirical Strategy

The study employed a sample of 67 developing countries for which data was available. Furthermore, to estimate marginal differences on the impact of kidnapping rate on capital flight, the sample was disaggregated into 'fragile' (21 countries) and 'less fragile' (46 countries). The data was annual and from the period 2003–2017. The baseline regression was estimated using the OLS technique. However, to control for unobserved factors that are time invariant within our sample, and for possible heterogeneity across our sample countries, the data was further estimated using the fixed effects technique. The fixed effects model also allows for greater degrees of freedom and more explanatory power in the regression (Baltagi, 1995; Gujarati, 2004). The fixed effects equation is mathematically expressed as

$$Capital\ flight_{it} = \alpha_i + \beta * Kidnapping\ rate_{it} + \beta * GDP\ growth(volatility)_{it} + \beta * Inflation_{it} + \beta * Oil\ rent_{it} + \beta * Trade\ openness_{it} + \beta * Foreign\ aid_{it} + \beta * Savings_{it} + \beta * Exchange\ rate_{it} + \mu_i + v_{it} \quad (1)$$

where i and t represent individual country and time, α and β are the coefficients to be estimated, and μ_i and v_{it} represent the disturbance term – country-specific effects and random errors distributed.

Irrespective of the superiority of the fixed effects technique over the OLS technique, there may be a potential for reverse causality (or endogeneity) on the relationship between capital flight and kidnapping rate. Economic depression, lack of entrepreneurial activities, limited economic opportunities, and low levels of productive investments due to capital flight can contribute to a higher unemployment rate in developing countries. Subsequently, higher unemployment rate is one of the factors that can lower the opportunity cost of individuals participating in kidnapping, needed to fulfil their monetary or material needs brought about by unemployment (Osumah and Aghedo, 2011). Thus, the relationship may also run from capital flight to kidnapping. To help address this concern, we employed the two-stage system Generalised Method of Moments (GMM). The relevant diagnostics and tests showed that estimates of the system GMM are

preferred to those of the difference GMM. Furthermore, the GMM technique helps address any problems of unobserved characteristics assuming that our explanatory variables are not completely exogenous (Blundell et al. 2000; Bond et al. 2001). The GMM equation is mathematically expressed as

$$Capital\ flight_{it} = Capital\ flight_{it-1} + \beta * Kidnapping\ rate_{it} + \beta * GDP\ growth(volatility)_{it} + \beta * Inflation_{it} + \beta * Oil\ rent_{it} + \beta * Trade\ openness_{it} + \beta * Foreign\ aid_{it} + \beta * Savings_{it} + \beta * Exchange\ rate_{it} + d_t + \varepsilon_{it} \quad (2)$$

5. Results and Discussions

a. Baseline Regression

Results of the baseline regression are shown in table 5 (model 1). Kidnapping rate was positive but statistically insignificant to capital flight. However, given possible heterogeneity across our sample and the inability of the OLS to control for time invariant unobservable factors, the estimates of the baseline regression may be inconsistent. Therefore, discussions of the empirical results will not be weighted towards estimates of the OLS regression. Nevertheless, the result still points to a positive economic relationship between kidnapping rate and capital flight. The result of the fixed effects (table 5, model 2), which controls for time invariant factors, was positive but insignificant. Again, the result of the fixed effects may still not be consistent if there is a possibility that the relationship also runs from capital flight to kidnapping rate. This leaves our study with estimates of the GMM that are the most consistent, and, thus, the discussions of our results will be waited in favour of the GMM results. For the GMM estimation (table 5, model 3), kidnapping rate is positive and significant to capital flight. The size of the coefficient is also larger. An increase in kidnapping rate by 1 will increase capital flight by 1.3652 percentage points of GDP. There is also a confirmation of the capital flight trap as can be seen in the positive and significant impact of the lagged capital flight. Thus, our hypothesis 1 of a positive relationship between kidnapping rate and

capital flight is accepted. We employ some arguments to explain the reasons why our results have shown a positive relationship between kidnapping rate and capital flight.

INSERT TABLE 5

First, kidnapping is one of several typologies of crime and its effect, can create economic and investment uncertainties. The implication is that there is a lack of incentives on the part of wealth owners to invest in countries that are perceived as unsafe, and hence, an increase in capital flight (Carboni and Detotto, 2016). Second, the psychological fear associated with being kidnapped can significantly alter the behaviour, consumption, and commercial activities of wealth owners. Such persistent alterations and behavioural changes would, amongst other things, most likely encourage capital flight (Robles et al. 2013). Third, kidnapping and associated crimes can create a negative shock on wealth and may also disrupt labour market outcomes. Therefore, if these factors result in a reduction in household income levels, and, subsequently, poor economic performance through a reduction in demand, then there is likely to be an increase in capital flight (Velasquez et al. 2019). Fourth, interpersonal trust and freedom are important for engaging in investment activities. However, incidences of kidnapping have the potential of eroding trust, freedom, and social cohesion. In the absence of these factors, there is likely to be an increase in capital flight (Robles et al. 2013).

With respect to the control variables, the results are mainly consistent across the estimation techniques. However, the discussions will be weighted towards the estimates of the GMM technique (table 5, model 3). The volatility in the growth rate of GDP is positive and significant to capital flight. This is consistent with the argument that volatility in growth creates macroeconomic instability, which can reduce the incentives of investors, and, thus, accelerate capital flight (Ahmed and Suardi, 2009). Inflation is negative but insignificant. This is against the expectation of a positive and significant relationship with capital flight. Nevertheless, this finding

is consistent with some existing studies (e.g., Harrigan et al. 2002; Ndikumana and Boyce 2003; Ljungwall and Wang, 2008) that have either concluded on a negative or insignificant relationship between inflation and capital flight. A negative relationship is economically supported if domestic inflation leads to a large portfolio shift towards domestic inflation hedges and away from the demand for foreign assets (Harrigan et al. 2002). Oil rent was negative but insignificant. Therefore, a convincing statistical argument cannot be established that rents from oil have reduced capital flight by providing a vehicle for rent-seeking foreign capital inflows.

Openness to trade was positive and significantly related to capital flight. This is consistent with existing findings and confirms the possibility that transfer pricing and mis-invoicing of exports and imports, which are easily practiced with increased trade openness, can accelerate capital flight (Asongu and Amankwah-Amoah, 2016).

Similarly, foreign aid is positive and significant. An increase in foreign aid can facilitate the foreign exchange and liquidity needed to support capital flow (Ndikumana and Boyce, 2003) and this may potentially be explaining this positive relationship in our sample countries. As expected, savings rate is negative and significantly related to capital flight. The availability of financial resources, as can be implied from increased savings, can potentially stimulate productive domestic investments, broaden the capital and money markets, and, subsequently, reduce any outflows of capital (Ndikumana, 2014). The positive impact of the exchange rate supports the argument that devaluation of the local currency can lead to capital flight by making the acquisition of foreign assets more desirable (Hermes et al. 2002).

b. Robustness to an Alternative Specification

We re-estimated our regression by employing an alternative measure of capital flight (direct approach). This approach measures capital flight by excluding the foreign assets of the private banking system. This is because an argument can be rationalised by claiming that private banks do not engage in capital flight since inter-bank transfers are essential components of international

financial intermediation (Azam and Quazi, 2003). Table 6 presents the results of this alternative specification. The results are consistent and very similar (with only slight differences in the sizes of the coefficients) to a previous analysis that used the indirect measure of capital flight. An increase in kidnapping rate (table 6, model 3) by 1 will increase capital flight by 1.2467 percentage points of GDP. The same argument presented in the previous section in support of these findings can still be applied here as well.

INSERT TABLE 6

c. Estimations of Marginal Differences

It is important that our analysis considers any marginal differences[5], based on the country classification, on the impact of kidnapping rate on capital flight. To benchmark this category, we adopt the Fragile State Index (FSI) classification of countries based on their level of 'fragility'. 'Fragility' is a broad term associated with countries in which their governments are no longer able to control every part of their territories. First, there are existing studies that have supported the relationship between fragility and kidnapping (Lewis, 2013; Pires et al. 2017). Second, in our sample, countries classed as 'fragile' by the FSI have contributed to almost 90% of all kidnapping incidents. The results of the 'fragile' and 'less fragile' marginal difference estimations are shown in table 7. The results showed that kidnapping rate is positive but only significant in the sample of 'fragile' countries. Thus, our hypothesis 2 that the impact of kidnapping on capital flight will be more in 'fragile' countries is accepted. We can justify this finding as follows. First, countries that are already 'fragile' will find it very difficult to combat crime and they may also lack the institutions required to mitigate against the aftermath of crimes (Pires et al. 2017). Second, in 'fragile' countries, there is a sustained degradation of functional markets, which will make it difficult for investments

[5] Marginal difference allows for an estimation of the differences in the slopes of two regression lines.

to be sustained. Third, 'fragile' countries suffer from lack of trust, social cohesion, rule of law, and economic inequalities (Silva, 2013). All these are recipes for capital flight. Finally, 'fragile' states often lack the ability to formulate and implement policies that can increase investors' confidence or cushion the negative consequences of crime (Brinkerhoff, 2015).

INSERT TABLE 7

d. Estimates of a Lose Proxy for Capital Flow

Although this is less widely used in studies, with the 'narrow' measure of capital flight it can be argued that capital flight should be based on the short-term acquisition of foreign assets by the non-bank private sector. The reason it is less adopted in studies stems from the fact that in today's world, long-term financial assets are almost as liquid as short-term assets and should be regarded as close substitutes. Therefore, it is regarded as inaccurate to estimate capital flow by excluding long-term capital outflows. Although, data on the short-term acquisition of foreign assets by the non-bank private sector were not available, and thus it would have been impossible for us to estimate our analysis based on the 'narrow' measure. However, we still somehow accommodated for this by proxying for this 'narrow' measure with long-term capital outflows rather than short-term outflows. That is, we used FDI outflows (% of GDP)[6] as a lose proxy to capture capital outflow. Since outflows from developing countries are regarded as capital flight, irrespective of whether the outflows constitute the repatriated earnings of a non-resident, then reinvested earnings should equate to reduced capital flight. Therefore, reinvestment of earnings, and increase in equity capital in a foreign country in the form of FDI outflows, can be treated as part of capital flight by the home country (Kant, 1996). Also, according to recent arguments, capital flight is not

[6] FDI outflows are the sum of transactions that increase equity capital, reinvestment of earnings, and other capital by residents in one country for control and management of an enterprise in a foreign country (WDI, 2020). In simple terms, this adds to the transfer of capital abroad (Al-sadiq, 2013).

considerably different from any other financial flows (Ndikumana, 2014). Although, FDI outflows are encouraged in developing countries as a means of seeking external markets, natural resources, technology acquisition, etc. (Fung and Garcia-Herrero, 2012), an excessive outflow of capital can be undesirable, particularly, if influenced by political instability and macroeconomic uncertainties (Kayam, 2009). With respect to the descriptive statistics, FDI outflows for the sample of countries is 1.4988 (% of GDP). The results are presented in table 8. Once again, this is consistent with the previous results. Kidnapping rate is positive and significant to capital outflows. The estimations of the marginal differences also showed that this significant impact is only consistent in the sample of 'fragile' countries.

INSERT TABLE 9

e. Estimates of the Winsorized Data

It is also important that our study controls for any potential problems with outlying values. Controlling for this, is another way of subjecting our results to further robustness analysis and ensuring consistency. Thus, we winsorized the data. Winsorization is a technique that ensures extreme outliers within the data are replaced with the value of the highest data point that is not represented as an outlier. The process ensures that the transformed data reduces the effects of the outliers without removing the number of observations within the dataset (Molyneuxa et al. 2019). The data was winsorized at different conventional levels of 1st and 99th, 5th and 95th, and 10th and 90th percentiles. However, only estimates of the 10th and 90th percentiles are reported because the coefficients of the other conventional levels are very similar to those that were not winsorized. The results are presented in table 9. As can be seen, the results are consistent with our previous results on the relationship between kidnapping rate and capital flight in developing, fragile, and less-fragile countries.

INSERT TABLE 9

6. Conclusion and Limitations of Research

a. Conclusion

This study presented empirical evidence of the relationship between kidnapping rate and capital flight in a sample of 67 developing countries over the period 2003-2017. To the best of our knowledge, there are no empirical existing studies on the relationship between kidnapping rate and capital flight in developing countries. Thus, this study has the potential to massively contribute to the literature of kidnapping or crime, and capital outflows. To capture capital flight, the study employed different measures of capital flight. The results showed evidence of a positive relationship between kidnapping rate and capital flight. The results were also consistent regardless of the measure of capital flight used. However, estimations of the marginal differences showed that the significant effect of kidnapping rate on capital flight is only sustained in our sample of 'fragile' countries. We can deduce the following policy implications from this study.

First, kidnapping has some deep-rooted causes in economic deprivation, marginalisation, poverty, government failure, etc. Therefore, it is imperative for policymakers to enact, implement, and sustain policies that will address some of these deep-rooted causes. Furthermore, well-functioning institutions (such as judiciary and law enforcement) should be properly empowered to apply appropriate punishments for kidnappers. Studies have shown that lack of stiffer punishment for kidnappers also contributes to the increase in kidnapping rates. Second, in the category of fragile countries, which has shown a consistent positive relationship between kidnapping rate and capital flight, these fragile countries should take appropriate steps in cushioning the adverse effects of crime. This may include developing strong institutional structures and implementing measures that will effectively protect the assets of owners of wealth. Third, developed countries may want to assist developing countries in dealing with the epidemics of crime. This is important considering

the potential negative impact that unchecked levels of crime can have on the vested interests that developed countries have in developing countries.

b. Limitations of Research

Regardless of the contributions to the literature and the knowledge gap that this study has been able to fill, there are still a few limitations. First, due to data availability, this study has not been able to cover all of the developing countries. Second, and again due to data availability, our study used the foreign assets of banks and FDI outflows to proxy for short-term foreign assets of private banks and short-term capital outflows by the private non-bank sector, respectively, in the computation of the direct and narrow approaches of capital flight. Nevertheless, as we have argued in the paper, this would have made negligible or no difference because in today's highly mobile international capital market, a short-term asset is highly as liquid as long-term capital assets. Third, it would have been ideal to have also estimated with another measure of crime besides the kidnapping rate. Incidents of robbery could have been used. But data for the number of robbery incidents do not have enough coverage and had plenty of gaps. Therefore, employing this variable would have made the analysis inestimable.

Data Availability Statement

Availability of data	**Availability of data**
Data openly available in a public repository that does not issue DOIs.	The data that support the findings of this study are openly available in the [United Nations Office for Drugs and Crime database] at [https://dataunodc.un.org/data/crime/kidnapping] and the World Bank Development Indicators [https://datacatalog.worldbank.org/dataset/world-development-indicators]

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Table 1: Sample countries. + is a sample of the 'fragile' countries.

Albania	Dominican Republic	Kyrgyz Republic	Philippines+
Algeria+	Ecuador	Lebanon+	Russian Federation
Armenia	Egypt, Arab Rep.+	Lesotho	Rwanda+
Azerbaijan	El Salvador	Madagascar	Serbia
Belarus	Eswatini	Maldives	South Africa
Belize	Georgia	Mauritius	Sri Lanka+
Bhutan	Guatemala	Mexico	Syrian Arab Republic+
Bolivia	Guinea	Moldova	Tajikistan
Bosnia and Herzegovina	Guinea-Bissau	Montenegro	Thailand+
Botswana	Guyana	Morocco	Turkey+
Brazil	Honduras	Myanmar+	Turkmenistan
Burundi+	India+	Nepal+	Uganda+
Cabo Verde	Indonesia+	Nicaragua	Ukraine
Cameroon+	Jamaica	Nigeria+	Uzbekistan
Colombia+	Jordan	Pakistan+	Yemen, Rep.+
Costa Rica	Kazakhstan	Paraguay	Zimbabwe
Dominica	Kenya+	Peru	

Table 2: Variable category and description

Variable Category	Variable definitions	Expected sign
Dependent Variables		
Capital Flight (% of GDP)	It is the outflow of resident capital from country *i* in year t which is motivated by economic and political uncertainty. It is expressed as a percentage of GDP.	
Main Independent Variable		
Kidnapping rate	It is the unlawful detainments and taking away of a person against their will in country *i* and in year *t*. This is normalised per 100,000 of population.	+
Control Variables		
GDP growth (volatility)	This measures the variance in growth of GDP for country *i* in year *t*. GDP is the sum of gross value added by all resident producers in the economy.	+
Inflation	Annual % change in the cost of consumer goods and services in country *i* and in year *t*	+
Oil rents	These are the difference between the value of crude oil production at world prices and total costs of production *i* in year *t*. It is expressed in percentage of GDP	-/+
Trade openness	This is the sum of exports and imports of goods and services in country *i* in year *t*. It is expressed as a share of GDP.	+
Foreign aid	This consists of disbursements of loans made on concessional terms and grants by official agencies to country *i* and in year *t*. It is expressed in per capita.	+
Savings	This is calculated as gross national income less total consumption, plus net transfers in country *i* in year *t*.	-
Exchange rate	This refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market in country *i* in year *t*. It is logarithm transformed.	+

Table 3: Summary statistics

Variable Category	Mean	25th Percentile	75th Percentile	Std. Dev.	Min.	Max.
Dependent Variable						
Capital Flight (% of GDP) – Indirect Approach	8.8062	1.3864	15.5556	14.8365	-65.5455	117.5610
Alternative Measure for the Dependent Variable						
Capital Flight (% of GDP) – Direct Approach	6.4829	-1.3674	14.7361	17.4181	-72.2909	111.4146
Main Independent Variable						
Kidnapping (per 100,000 of population)	1.5417	0.1460	1.2500	4.0488	0.0000	42.6690
Control Variables						
GDP growth (volatility)	9.3778	0.1760	5.9840	36.2382	0.0000	769.9124
Inflation	7.6521	3.0463	9.8273	8.5462	-18.8992	100.6270
Oil rent (% of GDP)	2.8242	0.0000	1.5955	6.4779	0.0000	42.3198
Trade Openness (% of GDP)	76.5188	51.7061	96.9152	32.0318	0.1674	200.7253
Foreign aid (per capita)	60.6673	12.6650	82.0138	78.8612	-26.3158	669.8413
Savings (% of GDP)	20.6835	14.1712	27.2045	10.8019	-16.3590	57.4741
Exchange rate	586.1878	6.3593	184.4440	1695.4333	0.2051	13389.4000

Table 4: Correlation matrix

		1	2	3	4	5	6	7	8	9	10
1	Capital Flight (% of GDP) - Indirect Approach	1.0000									
2	Capital Flight (% of GDP) - Direct Approach	0.9582	1.0000								
4	Kidnapping (per 100,000 of population)	-0.0245	-0.0245	1.0000							
5	GDP growth (volatility)	0.0786	0.0786	0.0067	1.0000						
6	Inflation	0.1059	0.1059	0.1126	-0.0573	1.0000					
7	Oil rent (% of GDP)	-0.2438	-0.2438	-0.1020	0.0179	-0.1313	1.0000				
8	Trade Openness (% of GDP)	0.2836	0.2836	-0.1228	0.0867	-0.0819	-0.1043	1.0000			
9	Foreign aid (per capita)	0.3699	0.3699	-0.0252	0.0595	0.0284	-0.2312	0.3155	1.0000		
10	Savings (% of GDP)	-0.4342	-0.4342	0.0096	-0.0523	-0.0758	0.3922	-0.0078	-0.1676	1.0000	
11	Exchange rate (log)	-0.0694	-0.0694	-0.1556	-0.0140	0.1047	-0.0606	-0.2873	-0.0759	-0.0869	1.0000

Table 5: Regression results of capital flight (indirect approach) and kidnapping rate
Standard errors in parentheses. * significance at the 10% level; ** significance at the 5% level; and *** significance at the 1% level.

Dependent Variable: Capital Flight (% of GDP)	**OLS**	**Fixed Effects**	**GMM**
	Model 1	**Model 2**	**Model 3**
Capital Flight (% of GDP), Lag			0.0397***
			(0.0131)
Main Independent Variable			
Kidnapping (per 100,000 of population)	0.0485	0.0209	1.3652***
	(0.1383)	(0.2456)	(0.5182)
Control Variables			
GDP growth (volatility)	0.0652**	0.0819***	0.0322***
	(0.0262)	(0.0272)	(0.0001)
Inflation	0.0111	-0.0296	-0.0850
	(0.0242)	(0.0495)	(0.0629)
Oil rent (% of GDP)	-0.0397	-1.5023***	-0.0851
	(0.0985)	(0.3068)	(0.0551)
Trade Openness (% of GDP)	0.0813***	0.2104***	0.1051***
	(0.0218)	(0.0519)	(0.0279)
Foreign aid (per capita)	0.0598***	0.0556**	0.0505***
	(0.0089)	(0.0214)	(0.0075)
Savings (% of GDP)	-0.6514***	-1.1470***	-0.6176***
	(0.0623)	(0.1271)	(0.0309)
Exchange rate (log)	0.0998	-0.0001	0.7687***
	(0.2465)	(0.0015)	(0.2236)
Constant	12.4065***	33.7852***	17.3423*
	(3.4882)	(8.8292)	(9.1244)
F Stat	36.6900	10.4000	
Prob. > F/Prob > chi2	0.0000	0.0000	0.0000
No. of Obs.	510	510	496
Country/Year Effects	NO	YES	YES
Hansen J-Statistic Chi (sq.)			41.6100
Arellano-Bond AR(2) – Pr. > z)			0.6190
R Square/Within	0.3695	0.3478	

Note: number of observations is less than 1005 (67 × 15) due to gaps in the data for some of the countries. Values in the table have been approximated to 4 decimal places.

Table 6: Regression results of capital flight (direct approach) and kidnapping rate
Standard errors in parentheses. * significance at the 10% level; ** significance at the 5% level; and *** significance at the 1% level.

Dependent Variable: Capital Flight (% of GDP)	**OLS**	**Fixed Effects**	**GMM**
	Model 1	**Model 2**	**Model 3**
Capital Flight (% of GDP), Lag			0.0344**
			(0.0141)
Main Independent Variable			
Kidnapping (per 100,000 of population)	0.0988	0.0845	1.2467**
	(0.1614)	(0.2868)	(0.4901)
Control Variables			
GDP growth (volatility)	0.0750**	0.0728**	0.0182*
	(0.0305)	(0.0318)	(0.0106)
Inflation	0.0290	-0.0307	-0.0883
	(0.0284)	(0.0623)	(0.1238)
Oil rent (% of GDP)	-0.1059	-1.7508***	-0.1460**
	(0.1148)	(0.3583)	(0.0651)
Trade Openness (% of GDP)	0.0620**	0.2032***	0.1126***
	(0.0254)	(0.0625)	(0.0202)
Foreign aid (per capita)	0.0577***	0.0701***	0.0486***
	(0.0105)	(0.0251)	(0.0068)
Savings (% of GDP)	-0.7456***	-1.3593***	-0.6921***
	(0.0728)	(0.1514)	(0.0431)
Exchange rate (log)	0.0384	-4.1347	0.5281**
	(0.2899)	(2.5578)	(0.2265)
Constant	12.2976***	40.7910***	18.2122
	(4.0766)	(10.4088)	(17.2006)
F Stat	31.1100	9.7800	
Prob. > F/Prob > chi2	0.0000	0.0000	0.0000
No. of Obs.	505	505	491
Country/Year Effects	NO	YES	YES
Hansen J-Statistic Chi (sq.)			44.5400
Arellano-Bond AR(2) – Pr. > z)			37.7500
R Square/Within	0.3341	0.3494	

Note: number of observations is less than 1005 (67 × 15) due to gaps in the data for some of the countries. Values in the table have been approximated to 4 decimal places.

Table 7: Regression results of the marginal differences

Standard errors in parentheses. * significance at the 10% level; ** significance at the 5% level; and *** significance at the 1% level.

Models 1 & 2 are estimates of the indirect approach of capital flight and Models 3 & 4 are estimates of the direct approach of capital flight.

Dependent Variable: Capital Flight (% of GDP)	**GMM Model 1 Fragile Countries**	**GMM Model 2 Less-Fragile Countries**	**GMM Model 3 Fragile Countries**	**GMM Model 4 Less-Fragile Countries**
Capital Flight (% of GDP), Lag	0.0315**	0.4952***	0.0376***	0.4794***
	(0.0131)	(0.0165)	(0.0124)	(0.0199)
Main Independent Variable				
Kidnapping (per 100,000 of population)	0.0489***	0.0185	0.2083***	0.3703
	(0.0120)	(0.0131)	(0.0419)	(0.6557)
Control Variables	YES	YES	YES	YES
Constant	0.2254***	0.1430***	14.5354	19.2559***
	(0.0656)	(0.0319)	(15.0057)	(4.0470)
Prob. > F/Prob > chi2	0.0000	0.0000	0.0000	0.0000
No. of Obs.	494	494	491	491
Country/Year Effects	YES	YES	YES	YES
Hansen J-Statistic Chi (sq.)	41.8200	36.8300	44.2000	35.6000
Arellano-Bond AR(2) – Pr. > z)	0.7160	0.1140	0.4420	0.1490

Note: number of observations is less than 938 (67 × 14) due to gaps in the data for some of the countries. Values in the table have been approximated to 4 decimal places.

Control variables are included, but for brevity these were not reported because the results are mainly the same with previous estimations (tables 5 & 6).

Table 8: Regression results of capital flight (lose proxy) and kidnapping rate

Standard errors in parentheses. * significance at the 10% level; ** significance at the 5% level; and *** significance at the 1% level.

Model 1 is an estimate of the full sample and Models 2 & 3 are estimates of the marginal differences.

Dependent Variable: FDI Outflows (% of GDP)	**GMM Model 1 All Sample Countries**	**GMM Model 2 Fragile Countries**	**GMM Model 3 Less-Fragile Countries**
FDI Outflows (% of GDP), Lag	0.6605***	0.7714***	0.6507***
	(0.0123)	(0.0143)	(0.0124)
Main Independent Variable			
Kidnapping (per 100,000 of population)	0.3526***	0.4911**	0.1845
	(0.0572)	(0.1913)	(0.1559)
Control Variables	YES	YES	YES
Constant	-0.9610	6.4124***	-0.6184
	(1.4797)	(1.4668)	(0.5345)
Prob. > F/Prob > chi2	0.0000	0.0000	0.0000
No. of Obs.	494	494	494
Country/Year Effects	YES	YES	YES
Hansen J-Statistic Chi (sq.)	41.6800	31.4900	40.8900
Arellano-Bond AR(2) – Pr. > z)	0.112	0.1730	0.1110

Note: number of observations is less than 938 (67 × 14) due to gaps in the data for some of the countries. Values in the table have been approximated to 4 decimal places.

Control variables are included, but for brevity these were not reported because the results are mainly the same with previous estimations. OLS and Fixed effects estimates are also not reported because they are mainly the same with previous estimates (tables 5 & 6).

Table 9: Regression results of the winsorized data

Standard errors in parentheses. * significance at the 10% level; ** significance at the 5% level; and *** significance at the 1% level.
Models 1, 2 & 3 are estimates of the indirect approach of capital flight.
Models 4, 5 & 6 are estimates of the direct approach of capital flight.
Models 7, 8 & 9 are estimates of the lost proxy for capital flight.

Dependent Variable: Capital Flight (% of GDP)	**GMM Model 1 All sample**	**GMM Model 2 Fragile Countries**	**GMM Model 3 Less-Fragile Countries**	**GMM Model 4 All sample**	**GMM Model 5 Fragile Countries**	**GMM Model 6 Less-Fragile Countries**	**GMM Model 7 All sample**	**GMM Model 8 Fragile Countries**	**GMM Model 9 Less-Fragile Countries**
Capital Flight (% of GDP), Lag	0.1105***	0.0458***	0.5247***	0.0344**	0.0376***	0.4794***	0.6605***	0.7663***	0.6507***
	(0.0137)	(0.0102)	(0.0125)	(0.0141)	(0.0124)	(0.0199)	(0.0123)	(0.0128)	(0.0124)
Main Independent Variable									
Kidnapping (per 100,000 of population)	1.8527***	0.1053***	0.3252	1.2467**	0.2083***	0.3703	0.3527***	0.5535***	0.1845
	(0.5071)	(0.0346)	(0.5312)	(0.4901)	(0.0419)	(0.6557)	(0.0572)	(0.1713)	(0.1559)
Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	15.9116	12.7288	10.7638***	18.2122	14.5354	10.1524**	-0.9609	6.7789***	-0.6184
	(11.0423)	(9.2936)	(2.8501)	(17.2006)	(15.0057)	(4.0399)	(1.4796)	(1.4908)	(0.5345)
Prob. > F/Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
No. of Obs.	496	496	496	491	491	491	494	494	494
Country/Year Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Hansen J-Statistic Chi (sq.)	43.2500	41.2800	39.1300	43.5400	41.8200	35.6000	41.6800	33.7400	40.8900
Arellano-Bond AR(2) – Pr. > z)	0.4230	0.3840	0.0840	0.4900	0.7160	0.1490	0.1120	0.1720	0.1110