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The Impact of Capital Flight on Economic Growth in Bangladesh

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ABSTRACT

Objective: The primary aim of this research is to dissect the influence of capital flight on Bangladesh's economic advancement, with a focus on detecting the interconnected roles of determinants driving capital outflows.

Methodology: The study used the residual method to estimate capital flight in Bangladesh as an empirical approach. The Linear regression model has been used to estimate the effect of capital flight on the GDP growth rate, which is the proxy of economic growth. The causality test between capital flight and GDP growth is conducted using the Granger Causality test.

Findings: The empirically-driven findings reveal a surprising positive correlation between capital dispersal and Bangladesh's economic development, contradicting the initial hypothesis of a negative association. However, the causality test shows that GDP growth does not have any impact on capital flight in Bangladesh.

Practical Implications: This inquiry imparts significant perspectives about the repercussions of capital dispersion on the economic evolution of Bangladesh. Despite the unexpected positive association, it's crucial for Bangladesh to remain vigilant about potential risks correlated with capital flight. Consequently, this research proposes guidelines for regulatory bodies to restrain the consistent rise in capital outflows.

Originality/Value: This research stands out as it fills the intellectual gap overlooked by previous studies, which neglected to examine this aspect in the context of Bangladesh. Given Bangladesh's recent economic strides, understanding the impact of capital flight on its GDP growth is crucial.

Limitations: This study's scope is confined to the usage of the residual technique to approximate capital dispersal. A more robust research framework might offer a wider spectrum of results and a more profound comprehension.

1. Introduction

Economic policies in developing nations like Bangladesh primarily aim to secure market equilibrium, stimulate business growth, boost employment, and foster sustained economic development (Akinwale, 2020). Nevertheless, there is apprehension over the durability of this progress in Bangladesh due to the concurring capital exits and the inflow of foreign capital. These capital leaks could hinder sustainable economic growth (Rahaman, 2020). Gusarova (2009) highlighted the necessity of exploring the issue of capital drainage and its impact on the country's economic expansion.

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The trend of globalization has made it easier to flow capital across national borders, which has increased interest in the impact of capital flight on domestic economies. The true meaning of capital flight is a topic of debate among researchers. Capital flight indicates the movement of investment from one country's economy in pursuit of better prospects or higher returns to other nations (Liew, 2016). It differs from regular capital outflows in terms of motivation for investment or trade. Additionally, capital flight might include illegal transfers of capital abroad that violate the laws of the originating country (Aziz, Khayyam & Uddin, 2014).

Challenging economic and political scenarios such as high inflation, political turbulence and currency instability of a nation can trigger capital flight. Other instigators of capital flight may include financial misconducts leading to significant illegal gains, corruption in tax administration, export under-reporting and import over-reporting, illegal financial activities in state-owned enterprises, non-payment bank loans by major industrial institutions, stock market manipulation, and the accumulation of unlawful wealth by illegal means (Uddin, Yousuf & Islam, 2017). While numerous factors might contribute to capital flight, Rojas-Suarez (1990) suggested that the primary driver is the possibility of substantial capital losses on domestic assets due to seizure, inflation or currency depreciation.

Capital flight not only aggravates a nation's debt scenario but also negatively affects investments. It directly interrupts the country's economic expansion by influencing investment and fiscal balance (Lawanson, 2014). Capital flight can restrict a nation's capacity to finance public and private investments, posing significant challenges for developing countries that may fall short of financial resources necessary for growth and development when a large chunk of capital departs the nation. Consequently, these countries lose resources that could otherwise be allocated for domestic welfare and debt repayment. This, in turn; results in reduced investment levels, escalated unemployment, social upheaval, poverty and starvation, and a general economic recession in the country ((Nelson et al., 2018).

Besides, the outflows can be substantial enough to influence a country's financial system, particularly in developing countries like Bangladesh, where the economy may not be robust enough to bear large capital flights. Legal and illegal capital flight poses a significant hurdle for many developing countries, particularly heavily indebted ones, which struggle to secure new loans and grapple with balance of payment issues (Hamburg, 1985). Therefore, economic growth is often perceived as being hindered by capital flight (Rojas-Suarez, 1990).

Though there is an abundance of studies that investigates the impact of capital flight on developing countries' economic growth, the scenario of Bangladesh remains relatively understudied in this regard. Whether legal or illegal, capital exits from developing nations can adversely impact the economy by creating a deficit in capital accumulation (Akinwale, 2020). Capital flight poses a significant obstacle for Bangladesh, a nation desperately urges the need for capital for investment, job creation, infrastructural enhancement, poverty eradication and overall socioeconomic improvement. As a developing country, the situation of Bangladesh is disconcerting given the ramifications of capital flight.

The Global Financial Integrity (GFI) report revealed a shocking reality: Bangladesh ranks second in South Asia regarding illicit financial exits. A subsequent GFI study in 2019 disclosed that between 2009 and 2015, Bangladesh suffered an estimated annual loss of 6.0 to 9.0 billion US dollars due to these illegal capital outflows (Global Financial Integrity, 2019). Further data suggest that, because of its illicit fund flows (IFFs), Bangladesh holds the second-highest position among South Asian countries, only behind India (Haider, 2019).

Capital flight is not a recent issue for Bangladesh. Rather Bangladesh witnessed large-scale money laundering during political turmoil, such as the contentious parliamentary elections in 2012. From 2001 to 2010, the country lost approximately USD 14 billion in illicit fund flows. In 2014, GFI ranked Bangladesh 51st among 145 countries negatively impacted by illicit capital flight (Dewan, 2015). According to the Swiss National Bank, Bangladeshis deposited around Tk 4,091 crore (481 million) in Swiss banks in 2017 (Byron & Mirdha, 2019).

Illegal capital flight continues to plague Bangladesh's economy despite constant government efforts as it obstructs both private and public investments in diverse sectors. According to a US State Department study in November 2020, Bangladesh had illegal investments worth more than $3 billion by 2018, which is around 75 times more than what they did legitimately (Newage, 2021). The enormous capital flight is a roadblock to Bangladesh's progress, as it obstructs both private and public investments in diverse sectors.

Prompted by the significant occurrence of capital outflows in Bangladesh, particularly in recent years, this study seeks to address the urgent issue of unauthorized financial transfers that have surpassed a significant amount in the past decade. While capital outflows are a global concern, the situation in Bangladesh warrants specific attention due to its potential implications (Prothom Alo, 2016). Therefore, it is crucial to meticulously investigate the potential effects of capital outflows on the country's economic development and equip policymakers with evidence-based insights to devise effective strategies.

The primary goal of this study is to examine the impact of capital outflows on Bangladesh's economic expansion. Despite existing research on the macroeconomic drivers of capital outflows (Alam & Quazi, 2003; Uddin & Yousuf, 2016), there is a lack of specific studies focusing on the relationship between capital outflows and economic expansion in Bangladesh. Therefore, this study seeks to empirically investigate the links between economic growth and capital outflows in Bangladesh. The research hypothesis indicates that capital outflows negatively affect the country's GDP growth rate. A comprehensive time-series data set is used to measure capital flight and its influence on GDP growth. The research question examined in this study is: Does capital flight affect the economic growth of Bangladesh?

The study first determined the aggregate amount of capital flight from Bangladesh during 1977-2020. Then, an econometric study is carried out to assess the impact of capital outflows on economic growth. Additionally, the study seeks to establish the cause-and-effect relationship between capital outflows and economic growth. The research concludes by presenting potential policy implications derived from the findings, offering valuable insights for policymakers to formulate effective strategies and tackle the issue of capital outflows in Bangladesh.

2. Literature Review and Theoretical Framework

2.1 The Concept of Economic Growth

Economic growth represents an increase in a country's overall production of goods and services, resulting in an enhanced quality of life (Friedman, 2017; Lewis, 2013). It is typically characterized by a rise in the Real Gross Domestic Product (GDP), in percentage rate. Additionally, economic growth acts as a barometer of an economy's financial health, progress, and transformation (Upreti, 2015). A positive association exists between investment and economic growth, while political unrest tends to negatively impact economic growth (Barro & Lee, 1994). Gross Domestic Product (GDP) is one of the major proxy measures to represent a country's economic growth among many indicators like financial development, national income, economic output, human capital, etc. (Hasan et al., 2011; Asteriou & Agiomirgianakis, 2001). A nation's financial condition can be assessed by analyzing its GDP rate, which represents the cumulative market value of all goods and services produced within a specific period (WESP, 2016).

2.2 The Concept of Capital Flight

Capital flight, a phenomenon more widespread than commonly believed, has an elusive perception and complex definition (Claessens & Naude, 1983). This phenomenon can be detrimental to the home country as it hinders economic growth, increases foreign debt, and impedes development efforts. Researchers have varying perspectives on how to define capital flight. However, two commonly recognized approaches to conceptualize capital flight are the direct "hot money" approach and the indirect "residual" approach (Ndikumana, Boyce & Ndiaye, 2014). The "hot money" approach

describes capital flight as short-term capital outflows through speculative actions (Cuddington, 1986) driven by domestic, political and financial uncertainties such as financial crises, heavier taxes, proposed restrictions on capital controls, significant devaluations of the domestic currency or hyperinflation.

In the residual approach, capital flight is viewed as subcategory and unrecorded capital outflows that are not included in official records (Cuddington, 1986; Guaranty, 1986). Legal outflows can boost a nation's economy because they enter another nation lawfully, but illicit outflows are not recorded and may go into private pockets rather than adding in other nations' national accounts (Rojas-Suarez, 1990).

Conversely, several authors (Umoru, 2013; Akinwale, 2020) define capital flight in terms of volume, viewing regular capital outflows as a form of investment portfolio diversification, while abnormal outflows are seen as extensive currency speculation. Capital outflows are deemed abnormal when they are substantial enough to impact domestic financial markets, often provoked by unfavorable economic or political circumstances, such as major devaluations of the domestic currency that result in a decline in capital value.

The concepts of capital flight and illicit financial flows are frequently used synonymously, but a distinction exists there. Capital flight is characterized as the exodus of capital from a nation, while illicit financial flows encompass illegal activities such as trade misinvoicing, money laundering, smuggling, and human trafficking (Yalta, 2009). Capital flight is perceived as a detrimental occurrence for a country as it can hinder economic growth, augment foreign debt, and obstruct development endeavors. Despite its significance, the definition of capital flight varies among scholars. Cuddington (1986) expressed it as short-term speculative capital outflows, whereas others view it as unregistered flows (Cuddington, 1986; Guaranty, 1986). Some argue that capital flight is not a phenomenon distinct from regular capital outflows, but rather a component of them (World Development Report, 1985).

Interestingly, the debate about capital flight’s perception is not settled yet (Williamson, 1987). Some economists consider capital outflows from citizens of industrialized countries to be foreign direct investments (Ajayi, 1992), while the exact thing is considered capital flight when it is transferred from a developing country. The reason is that, in developing countries capital resources are scarce and so the transfer of unwanted amounts may create problems for the economy of those countries. Moreover, the purposes of capital transfer are completely different. While it is assumed that investors of developed countries invest abroad to respond to better opportunities there, residents of developing countries transfer money to escape the risks of losses from the economic and political conditions in these countries.

Summing up the literature mentioned, there's an evident diversity of opinions among economists about the meaning of capital flight. Despite of having these differences, there's a broad consensus that capital flight refers to the transfer of assets out of a country's financial system to avoid potential losses triggered by domestic instability. This transfer is generally seen as being in opposition to the interests and needs of the domestic society (Harrigan, Mavrotas & Yusop, 2002).

Finally, capital flight can be interpreted as the outflow of any sort of private wealth by the citizens of a nation who want to lessen the level of current and possible governmental control (including the danger of expropriation) over such cash and buy assets abroad (Makochekanwa, 2007). There are various methods of quantifying capital flight dependent on its definition because the theory does not provide a singular definition of it (Cumby & Levich, 1987). Therefore, depending on the definitions and empirical estimates for particular nations, the resultant estimates of capital flight may vary.

2.3 Measures of Capital Flight

There are alternative ways to measure capital flight as different authors stated the concept from different viewpoints. Some research uses a single technique, whereas others employ multiple methods

for comparative analysis. For instance, Ndiaye's (2011) study employs four well-known methods to measure capital flight: the hot money technique, the Dooley technique, the residual technique, and the asset technique.

The hot money method, introduced by Cuddington (1986), offers a narrower view on capital flight as it only takes into account short-term unauthorized transfers from non-banking private sectors and statistical inconsistencies in the balance of payments. In contrast, the method by Dooley (1986) differentiates between ordinary and atypical capital flows based on an individual's intent to shield wealth from domestic authorities, positioning it as a non-residual measure of capital flight. In this case, capital flight pertains to the aggregate quantity of assets held overseas by the private sector that do not contribute to the country's balance of payments. The residual or Morgan Guaranty method, proposed by the World Development Report (1985), assumes a broader approach, estimating capital flight by subtracting the applications of funds from their sources. This approach assumes that the banking sector has no involvement in capital flight and that the acquisition of foreign assets is the act of the non-bank private sector (Guaranty, 1986). Notably, despite the diverse methods used to compute capital flight, the end results often coincide due to the balance of payment identities employed (Claessens & Naude, 1983).

An alternate method proposed by Harrigan, Mavrotas & Yusop (2002) divided capital flight measures into direct and indirect categories. The direct method interprets capital flight as a short-term outflow in response to domestic, political and economic fluctuations, expectations of devaluation, elevated domestic taxes, and other risk determinants. The idea behind the direct approach is that it is easy and straightforward to choose certain variables that form capital flight and then directly attain data for those variables recorded in the balance of payment to calculate capital flight while excluding long-term investments. On the other hand, the indirect method considers discrepancies between documented inflows and applications of foreign exchange as capital flight, not merely the recorded outflows. This method is a residual computation that encompasses four elements of the balance of payments: foreign direct investment, alterations in foreign debt, the current account balance, and shifts in foreign reserves (Guaranty, 1986). The underlying idea is that capital inflows finance either the deficit in the current account or the accumulation of official reserve and if there is any shortage, that is regarded as private foreign asset accumulation, which ultimately links it to the capital flight. This method is commonly preferred by researchers as it provides a more comprehensive measurement opportunity compared to the direct method.

In summary, the broad spectrum of definitions and measurements of capital flight underscores the challenge of identifying the most appropriate definition and measurement. These disparities in methodologies and measures can result in variations in the computation of capital flight.

2.4 Relation between Economic Growth and Capital Flight

To increase the economic growth level, capital inflow is very important as it stirs capital formation, resulting in a substantial level of investment which translates to high levels of returns. On the other hand, the economic growth level is stalled if there are capital outflows rather than inflows (Gachoki & Nyang'oro, 2016). Capital flight worsens when imbalances in capital inflows and outflows undermine internal capital generation. A deficiency of capital inflow can hinder economic advancement (Gusarova, 2009). When a nation's savings and foreign capital inflows are illicitly invested abroad rather than domestically, it may result in declines in domestic savings, investments, and consequently, economic growth (Gachoki & Nyang'oro, 2016). Countries heavily reliant on external financing or international aid are particularly prone to capital outflows as these can threaten economic durability (Uzoma & Godday, 2019).

Different studies have linked economic growth and capital flight differently. For example, Lawal et al. (2017) showed that capital flight impacts the economic growth of Nigeria adversely, using variables such as the current account balance, foreign direct investments, foreign reserves, inflation rate, real gross domestic product, capital flight and external debt. Similarly, Umoru (2013) explored

that capital flight has a negative effect on GDP growth in Nigeria due to poor capital control and exchange control. Gusarova (2009) also found the same result using a data set of 139 countries but the significance of the impact was ambiguous. In the case of Ajayi's (2012) study, the impact of capital flight was also negative on capital flight and the result was also significant. The study used a 40-year data set and the co-integration and Error Correction Mechanism (ECM) as the main estimation technique. Besides, Uzoma & Godday (2019) conducted a study on the Nigerian economy for the period of 1990 to 2017 and showed a significant relationship between capital flight and gross domestic product, which was a proxy measure for economic growth, using ordinary least square (OLS) econometrics model and proxy variables for capital flight. Also, the study investigated the impact of net foreign investment and debt servicing on the economic growth of Nigeria.

Numerous factors can influence economic growth through capital flight, including foreign investments, imports, capital inflows, the tax base, imbalances in the balance of payments, and corruption. Capital flight is typically regarded as a barrier to economic growth (Rojas-Suarez, 1990), as it signifies a depletion of domestic resources that could have been leveraged to amplify national investment and repay debt. Capital flight can also deflate the government budget balance, erode the tax base, and impede public investment (Ajayi, 1992). If capital outflows occur illicitly, limited foreign exchanges used to fuel capital flight could deprive the nation of capital essential to pay for imports, leading to a negative impact on the government budget. This could coerce the government to seek loans from overseas, inflating the national debt and retarding economic progress (Lawanson, 2014).

Capital flight can additionally destabilize a country's financial framework, necessitating abrupt shifts in interest and exchange rate policies to offset the substantial resource depletion (Ndikumana, Boyce & Ndiaye, 2014). This results in macroeconomic instability that can impact economic growth. Furthermore, capital flight can be symptomatic of a corrupt setting, which can adversely influence economic growth (Ndiaye, 2011).

Interestingly, some studies have found a two-way relationship between capital flight and economic growth, as opposed to the one-way relationship commonly expressed in most studies. The study by Badwan & Atta (2019) using Granger Causality Tests between 2009 to 2018 found that not only capital flight affects economic growth, but also economic growth Granger Causes capital flight. While in some countries, economic growth leverages capital flight by availing additional capital to the economy, some other countries lose billions of dollars to capital flight when they receive foreign capital inflow. For instance, using the Ordinary Least Square (OLS) method, Granger Causality Tests, and Correlation Tests the study of Refai, Abdelhadi & Aqel (2015) found that economic growth impact capital flight negatively.

In conclusion, while the majority of studies suggest a negative association between capital flight and a country's economic progression, others have identified a two-way reciprocal relationship. Given the ambiguity surrounding the definition and impact of capital flight, the current study endeavors to explore how capital flight has affected economic development in Bangladesh.

2.5 Hypothesis Development

While the empirical research available presents a variety of findings, these disparities could be attributed to the diverse timelines, methods, variables, and geographies considered in each study. However, amidst these inconsistencies, one common conclusion emerges: economic growth and capital flight are typically inversely correlated. Consequently, for the context of Bangladesh, the following hypotheses can be drawn:

- **H_0**: There is zero or positive relationship between capital flight and the economic growth of Bangladesh.
- **H_1**: There is a negative relationship between capital flight and the economic growth of Bangladesh.

3. Methodology of the Study

3.1 Research Design

The primary aim of this investigation is to explore the influence of capital flight on the economic progress of Bangladesh, heavily relying on a quantitative approach. The study's theoretical underpinnings rest on historical documents and statistical data, permitting a numerical exploration of the correlation between capital flight and economic prosperity, a feat unachievable with qualitative methods. In this study, the linear regression method and residual method have been used to estimate the impact of capital flight on the country's economic growth. Economic growth is represented through the GDP growth rate. To discern the cause-effect linkage between capital flight and GDP growth, a Granger Causality test is employed, given its ability to accurately gauge bidirectional associations between variables.

3.2 Data Sources

This study is conducted on time series data covering from 1977 to 2020 of Bangladesh to understand how capital flight is affecting the economic growth of Bangladesh in the long run. Bangladesh had to face economic turmoil from its independence in 1971, especially for five years transitional periods (1972,1973,1974,1975 and 1976) (Aziz et al., 2014). This study covers the data from the period of 1977 obtained from secondary sources i.e., Bangladesh Bank, IMF (International Monetary Fund) and World Bank's World Development Indicators (WDI). As for exchange rate volatility, all data sets are measured using dollars (US$) as a standard and less volatile measure. Though capital flight occurs frequently within a year, annual data has been used in this study due to the unavailability of granular data on capital flight.

3.3 Estimation Techniques for Capital Flight

In this study, an indirect approach is used to gauge capital flight to reduce the ignorance of unrecorded outflows which is one major problem of the direct approach (Eggerstedt, et. Al., 1995). In the context of Bangladesh, adjustments to short-term assets serve as a disguise for capital flight, enabling the overcoming of challenges associated with separating long-term and short-term investments. Capital flight is evaluated by juxtaposing the sources of capital inflows (net increment in external debt and net influx of foreign investment) with the utilization of these inflows (current account deficit and augmentation in foreign reserves) since it is illicit and often not documented. As the study's focus lies on unlawful capital outflows, it becomes less crucial to distinguish between normal and abnormal capital outflows. Hence, the residual or indirect technique is predominantly used to track capital flight. This approach initially accounts for the capital inflows due to foreign investment and increased external debt, which ideally should contribute to either reserve accumulation or the current account; any discrepancy between inflows and conventional outflows is then interpreted as capital flight. This method also aligns with prior research conducted in Bangladesh, such as those by Uddin et al. (2017) and Aziz et al. (2014).

3.4 Variable Measurements

The study is premised on the notion that capital inflows should finance a nation's reserves accumulation or the current account deficit. The capital flight serves as the dependent variable in this study. If a discrepancy arises, capital flight will be apparent. The study's objective is to quantify the assets privately accumulated overseas annually. Mathematically, capital flight is expressed as follows:

$$KF = \Delta ED + FDI - CA - \Delta FR \quad [1]$$

Where,

KF = Capital flight according to the residual method,
Δ ED = Change in the stock of gross external debt,
FDI = Net foreign direct investment inflows,
CA = Current account deficit/surplus,

Δ FR = Change in the stock of official foreign reserves.
Here, positive KF means capital flight while negative KF means reverse capital flight.

3.5 Model for Empirical Estimation

Previous studies aimed at understanding the influence of capital flight on economic growth have utilized different econometric models and proxy measures to signify economic growth as an independent variable. Gusarova (2009) represented economic growth with a variety of variables including gross capital formation, GDP, life expectancy, inflation rate, trade growth, population growth, economic freedom, and political rights. Umoru (2013), however, used the GDP growth rate as the economic growth indicator.

Ajayi (2012) applied the co-integration and Error Correction Mechanism (ECM) to identify the long-term and short-term associations among variables. On the other hand, Badwan & Atta (2019) used solely the Granger Causality test to discern the cause-and-effect relationships between variables, with both studies based on time-series data. Gusarova (2009), who used panel data and the Ordinary Least Square (OLS) model, diverged from the researchers mentioned above. Drawing upon these previous studies and considering the context of Bangladesh, this investigation will employ the following model and tests to comprehend the impacts of capital flight on economic growth

3.5.1 Model Specification

In this analysis, the GDP growth rate acts as the representative of economic growth. Economic expansion is determined utilizing the nominal GDP (gross domestic product) of Bangladesh. Consequently, the GDP growth rate is used as an alternative metric for economic growth (Uzoma & Godday, 2019). The antilog of GDP is utilized due to the significantly small percentage data of GDP when juxtaposed with large capital flight data. Hence, to establish a linear association with capital flight, the antilog of GDP is employed to amplify the base. The ensuing model is applied to test the hypothesis of the influence of capital flight on Bangladesh's economic progress:

$$EXGDP_t = C_1 - C_2KF_t + u_t \quad [2]$$

Here,
KF_t = Capital Flight using the Residual Method,

$EXGDP_t$ = Log of GDP growth rate,

C_1 = Intercept Parameter, which is the value of the dependent variable (EXGDP) when each of the independent variables takes the value zero.

C_2 =As per the literature review, there will be a negative relationship between KF and GDP. So, the sign will be negative. C_2 explains the average change in EXGDP when there is a one-unit change in KF holding other variables constant.

3.5.2 Econometric Tools to Find Out the Effects of Determinants

An econometric assessment is implemented in this research to discern the effect of capital flight on Bangladesh's economic growth. The analysis is founded on time series data, as the research concentrates on a singular country - Bangladesh. STATA software is employed to derive the outcomes. The econometric examination in this study is conducted in two phases: a test for stationary data and a test for linear relationships.

I. Stationary Data Test

The initial step includes performing unit root tests to verify the constancy of the variables over time, known as their "stationarity." The Augmented Dickey-Fuller Test is employed for this objective. Using non-stationary economic series in research may lead to multiple complications. Although various techniques exist to test stationarity, this study opts for the Augmented Dickey-Fuller Test, which is a commonly accepted unit root test.

II. Linear Relationship Test Between Dependent and Independent Variables, Autocorrelation and Causality Test

The second part looks at the potential connection between capital flight and economic development using the Ordinary Least Squares (OLS) regression model. The statistical significance of this link is confirmed using the T and F Test Statistics. The Breusch-Godfrey (BG) test is also used to look for any autocorrelation problems. To determine if there is a cause-and-effect link between capital flight and economic growth, either in the short or long term, the Granger causality test is lastly applied inside the framework of Vector Autoregression (VAR). As independent variables can affect the dependent variable in the short run or in the long run.

4. Results and Discussions

4.1 Capital Flight Estimation

In this study, the World Bank-recommended residual approach is used to quantify the concept of capital flight, which is represented by KF and serves as the independent variable. This method contrasts how money is used, such as the current account deficit and increases in foreign reserves, with the sources of money, such as net increases in external debt and foreign investment. In this situation, a positive KF number indicates a capital outflow, whereas a negative KF value indicates a capital inflow. The supplementary information contains the computed table.

Keeping in mind that a positive value implies capital flight and a negative one indicates the repatriation of capital, the data indicates that both phenomena, capital flight and its reversal, have been observed in Bangladesh. Starting with data from 1977, considering the initial five-year transition phase post-independence in 1972, capital flight in 1977 amounted to 673.09 million US dollars. This figure dramatically escalated to 1628.26 million US dollars by 1979, pointing to the ongoing issue of capital flight in Bangladesh since its early days. This concern significantly intensified in recent years, although after a notable period of reversal. A substantial reversal was observed between 2012 to 2016, after which capital flight started to climb again. Nonetheless, there was a steep decline in capital flight in 2019 and 2020. Despite this decrease, the risk of capital flight remains. The trend is more clearly illustrated in the subsequent chart:

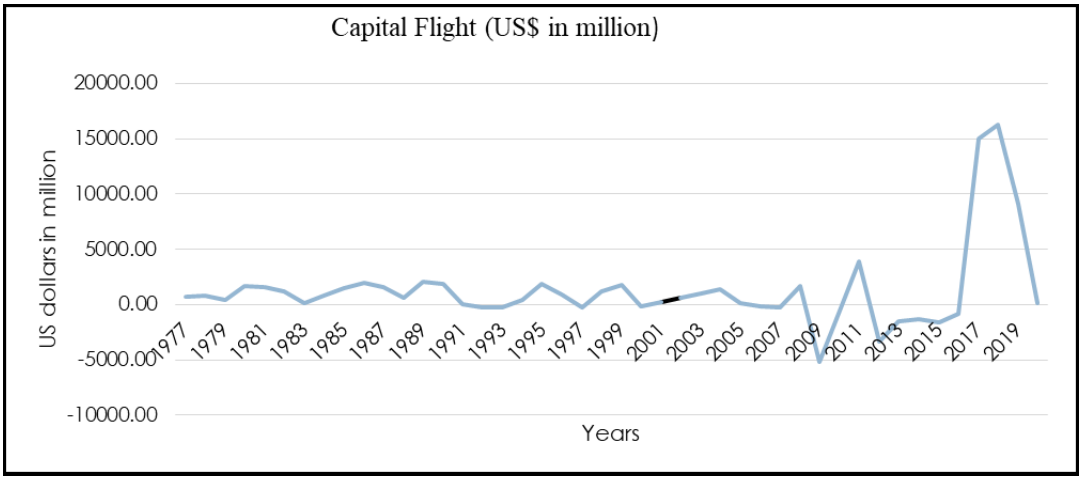

Figure 1
Trend of Capital Flight.
Source: Author computation from data IMF, WDI.

Here an upward trend of capital flight can be observed, which is a matter of concern for Bangladesh's economic growth.

4.2 Empirical Estimation of Determinants

4.2.1 Descriptive Statistics

Descriptive statistics refers to the basic features of the data set in a study with an aim to illustrate quantitative descriptions in an understandable form. In a word, these are the summarization of the samples and the measures that enable the researcher to present the data in a more meaningful way. The necessary descriptive statistics are presented in the table below:

Table 1

Descriptive Statistics

Stats	EXGDP	KF
Mean	459.3784	1293.019
Median	163.944	642.7171
Maximum	3472.688	16239.18
Minimum	2.268552	-5178.15
Standard Deviation	703.897	3736.468
Skewness	2.612637	2.672778
Kurtosis	10.34332	11.15598

Notes: KF= Capital Flight, EXGDP= Antilog of Gross Domestic Product.
Source: Author's computation.

The table shown above discloses that the peak volume of capital outflow from Bangladesh is at 16901.96 million US dollars, along with a reversal of capital reaching up to 5179.07 million US dollars. The mean capital outflow from Bangladesh stands at 1156.37 million US dollars, with a standard deviation of 3678.13. The most substantial GDP growth rate recorded stands at 3472.688 percent, corresponding to the antilog of 8.15 percent.

There are two metrics that offer an understanding of the structure of the dataset's distribution: skewness and kurtosis. Skewness gauges the balance of data distribution. For a flawlessly symmetrical dataset, the skewness is zero, which also matches the skewness of a normal distribution. From the table, it can be inferred that all variables display positive skewness, suggesting they are not balanced.

Conversely, kurtosis indicates the extent of the 'sharpness' of data distribution. Generally, if the kurtosis is more than +1, the distribution is excessively sharp, and if it's less than -1, the distribution is too flat. As per the results displayed above, the variables in this research exhibit a high degree of 'sharpness'.

4.2.2 The Unit Root Test

The Augmented Dickey-Fuller Test (ADF) is used as a unit root test to affirm the stationarity of the data. This method is vital since unit roots could generate unpredictable results in time series examination. The hypotheses for this examination are explained as follows:

Null hypothesis (H_0): There is a unit root or the time series is non-stationary.

Alternative hypothesis (H_1): The time series is stationary (or trend-stationary).

In this situation, it's crucial to correctly select the lag length to avoid autocorrelation in the residuals. In accordance with previous research, it's suggested to initiate with a larger lag and use the last significant large lag. The results can be interpreted in two manners:

1. If the p-value is less than 5%, it implies that we can reject the null hypothesis, which presumes the existence of a unit root.
2. Another way is to compare computed test statistics with a tabulated critical value.

If the computed t value is more negative than the table value, the null hypothesis of a unit root is rejected. If a variable is not stationary, it must be different d times for it to become stationary. Then the variable is denoted with (d).

Table 2

Results of Unit Root Test

Variables	Computed Test Statistics	Critical values			P Values	Conclusion
		1%	5%	10%		
EXGDP	-3.820	-3.628	-2.950	-2.608	0.0027	Stationary even at 1% level of significance
KF	-3.518	-3.628	-2.950	-2.608	0.0075	Stationary at 5% level of significance

Source: Author's computation.

Notes: KF= Capital Flight, EXGDP= Antilog of Gross Domestic Product.

Here, a 5% significance level is considered. So, it can be seen that all variables are stationary at a 5% level of significance.

4.2.3 Ordinary Least Square (OLS) Test

The multiple linear regression method is used to study the impact of the independent variables on capital flight using Stata Software.

Table 3

The Regression Model Results

Number of observations	44
F (1, 42)	27.68
Prob > F	0.0000
R-squared	0.3973
Adj R-squared	0.3829

Source: Author's Computation.

Table 4

Dependent Variable: EXGDP

Independent Variables	Coefficient	Standard Error	t	P>t	95% Conf. Interval	
KF	.1187356	.0225679	5.26	0.000	.0731918	.1642795
Cons	305.851	88.32034	3.46	0.001	127.6134	484.0887

Source: Author's Computation.

Notes: KF= Capital Flight, EXGDP= Antilog of Gross Domestic Product.

The goodness of fit of the estimated regression line is gauged by the R-squared (R^2) value. The model is more precise in fitting the data when this value approaches 1. However, since the value is near 0, it indicates that the model poorly fits the data. The Adjusted R-squared, which is roughly 38%, denotes that fluctuations in the independent variable explain about 38% of the variance in Bangladesh's GDP. Another hypothesis to contemplate is the overall statistical significance of the regression model. This overall significance is appraised through the F-statistic value. In this case, the F-statistic value is 27.68 with an associated probability of zero, which signifies the statistical importance of the regression model.

The second segment of the table illustrates the coefficients and the p-values of the t-statistics for the explanatory variable. For the coefficient, the null hypothesis contends that the population value of that coefficient is zero. This implies that when all other variables stay constant, the dependent variable—KF—doesn't impact EXGDP. In terms of the p-value, a smaller value provides more robust

evidence against the null hypothesis. Therefore, a value below the 5% significance level makes the effect of the regressor on GDP statistically significant. From the regression table, we can construct the following equation:

$$EXGDP = 305.851 + .1187356*KF + u_t \quad [3]$$

The estimated coefficient for KF is .1187, indicating a positive relationship between capital flight and economic growth. A 1% increase in capital flight would lead to a .12% growth in the economy. Therefore, it is not possible to reject the null hypothesis as a positive correlation has been discovered between KF and GDP growth rate.

The p-value indicates that this outcome has statistical significance at the 5% level, translating to a confidence level of 95% for this variable. Given that the p-value is 0.00, which is beneath the 5% level of significance, the result is regarded as statistically significant. However, this discovery contrasts with existing academic literature or economic theories that posit a negative relationship between capital flight and economic growth. Therefore, in the context of Bangladesh's economy, capital flight does not necessarily hinder economic growth, contradicting the initial assumption of this study.

4.2.4 Autocorrelation Test

Autocorrelation refers to the extent of similarity of a variable's values across consecutive time intervals. Sometimes called serial correlation or serial dependence, its presence in a model's residuals could suggest an inherent issue with the model.

The Breusch-Godfrey test is a frequently used statistical technique to detect autocorrelation. The null hypothesis for this test states: there is no presence of serial correlation of any order. The selection of lag length in this test is shaped by the specific characteristics of the time series.

Table 5

Result of Breusch-Godfrey LM test for Autocorrelation

lags(p)	chi2	df	Prob > chi2
1	0.683	1	0.4084
H0: no serial correlation			

Source: Author's computation.

Notes: df= degree of freedom, chi2= chi-square value, H0= null hypothesis.

From Table 5, it is evident that a lag length of 1 is selected, given that the data is annual. Since the chi-square probability surpasses the 5% level of significance, the null hypothesis of no serial correlation cannot be disregard, implying that the model does not exhibit serial correlation.

4.2.5 Granger Causality Test

The Granger causality examination is utilized to identify the causal relationship between two variables within a time-series dataset, aiding in the exploration of causal connections among variables. Before carrying out the test, it's vital to validate the stationarity of the variables (Lutkepohl, 2006). If any variable isn't stationary at the level, differencing should be applied in the Vector Autoregression (VAR) model.

This test uses the Vector Autoregression (VAR) model, where Granger causality implies a connection between the present values of one variable and the past values of other variables. The test functions as a statistical hypothesis examination to determine if one time series can forecast another. The null hypothesis contends: variable x does not Granger-cause variable y. If the probability value is below a certain significance level, then the null hypothesis would be dismissed at that level. In this case, significance levels of 1%, 5%, and 10% are employed. If the independent variables Granger-cause the dependent variable, they are deemed to exert a short-term causal impact on the dependent

variable. This implies that changes in these variables' past values possess the potential to influence the present values of the dependent variable.

Table 6

Result of Granger Causality Test

Null Hypothesis	df	Chi2	Prob.
KF does not Granger Cause EXGDP	2	19.626	0.000
EXGDP does not Granger Cause KF	2	3.1254	0.210

Source: Author's computation.
Notes: KF= Capital Flight, EXGDP= Antilog of Gross Domestic Product.

The table above demonstrates that capital flight (KF) has an impact on EXGDP, as the null hypothesis is dismissed due to the probability value being under 5%. This discovery signifies that capital flight influences Bangladesh's economic growth in the short and extended duration. However, EXGDP doesn't Granger-cause KF, as the probability value exceeds the 0.05 significance level.

5. Conclusions and Policy Implications

5.1 Conclusions

Capital flight is deemed as a barrier to economic growth as it leads to the depletion of local resources that could have been used for domestic investment. The issue of private capital fleeing from developing nations has been a significant concern for decision-makers since the early 1980s, a situation that became more serious with the onset of the debt crisis and the subsequent severe decrease in capital influx from developing countries. Reducing these capital outflows can have potential solutions to these problems. For instance, reversing capital flight could ease the debt crisis by bolstering developing countries' ability to pay off their debt, thus reviving their access to international capital markets. These considerations sparked this study, which reviews the impact of capital flight on Bangladesh's economic growth.

This investigation's goal is to evaluate the effects of capital flight on Bangladesh's economic development. The study explores the potential associations whether favourable or unfavorable between economic growth and capital flight using a time series data model. The World Bank's (1985) residual technique served as the foundation for the estimate of capital flight, and the graphical depiction demonstrates an increasing trend in capital flight from Bangladesh. The analysis relies on secondary data from the World Development Indicators and IMF statistics covering the period from 1977 to 2020 and utilises GDP growth as a proxy for economic development.

The autocorrelation test confirms the absence of serial correlation, and the unit root test of variables proves stationarity at the first level. The Ordinary Least Squares (OLS) model, in contrast to previous research, finds a significant yet positive relationship between capital flight and Bangladesh's economic development. According to the Granger causality test, capital flight has a short-term impact on Bangladesh's economic growth, even though GDP growth does not counteract the effect.

5.2 Policy Implications

Although the study found no link between capital flight and Bangladesh's economic growth, Bangladesh must monitor and control capital flight as a developing nation because of its potential effects on other economic sectors. The following policy recommendations are offered to control rapid capital outflows:

- Implementing robust measures to fight corruption at every tier, as corruption is often pinpointed as a significant trigger of capital flight.
- Promoting circumstances that incentivize the return of capital flight funds for domestic investment.
- Formulating a tempting and conducive atmosphere for investors to retain and augment their investments in Bangladesh.

- Enhancing the appeal of the domestic economy to investors by offering competitive returns compared to foreign financial instruments.

Additionally to stop capital flight, the National Board of Revenue (NBR), the central bank, and other law enforcement and intelligence organisations including the Anti-Corruption Commission (ACC) and Bangladesh Financial Intelligence Unit (BFIU) must work together.

5.3 Scope and Limitations of the Study

Here, capital flight estimation has several restrictions. The absence of data on transfer pricing, which is a significant factor in illicit money outflow, stands out among them. This issue might have an impact on how accurately capital flight is calculated. This issue frequently arises because some multinational corporations move earnings and costs to other divisions internally to lower their tax burden by charging above or below the market price when they purchase inputs from their linked companies in tax haven countries.

Since data for all variables before 1972 are unavailable and five years are regarded as a transitional period, the study concentrates on the effect of capital flight on Bangladesh's economic growth during the years 1977 to 2020. Due to time shortage and data unavailability, this study used only the GDP growth rate as a representation of economic growth.

The data from the reporting countries and the trading partner countries are combined thanks to the bank secrecy approach used by tax haven nations. As a result, bank secrecy conceals actual facts and makes assessment challenging.

Another limitation here is that the final result could not consider the recent volatility in the capital flight in measuring its relation with economic growth since the result found was an aggregate of all the chosen years.

5.4 Area of Further Research

There are several possibilities to further work on this topic. An important one will be to conduct studies using different proxy measures for economic growth along with GDP growth rate, for instance, foreign direct investment, poverty rate, public and private investment etc. To quantify capital flight in addition to the residual technique, another research may be carried out.

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Appendix

Appendix A

Capital Flight Estimation Table

Capital Flight from Bangladesh: 1977-2020 (US$ Million)

Year	ED	ΔED	FDI	CA	FR	ΔFR	KF
1977	2331.729	337.74	6.98	-280.96	241.50	-47.42	673.10
1978	2820.089	488.36	7.70	-383.91	321.26	79.77	800.20
1979	2967.069	146.98	-8.01	-415.95	413.65	92.38	462.54
1980	3802.229	835.16	8.51	-702.14	331.18	-82.46	1628.27
1981	4209.311	407.08	5.36	-1016.62	159.68	-171.50	1600.56
1982	4940.33	731.02	6.96	-500.67	208.53	48.85	1189.80
1983	5346.293	405.96	0.40	-45.80	545.88	337.35	114.82
1984	5541.814	195.52	-0.55	-477.65	408.09	-137.80	810.41
1985	6530.064	988.25	-6.66	-455.17	356.20	-51.89	1488.65
1986	7913.83	1383.77	2.44	-625.18	434.86	78.66	1932.72
1987	9737.967	1824.14	3.21	-237.12	876.25	441.39	1623.07
1988	10275.89	537.92	1.84	-272.84	1076.51	200.26	612.34

1989	10701.05	425.16	0.25	-1099.57	532.10	-544.41	2069.39
1990	12291.78	1590.73	3.24	-397.91	659.57	127.47	1864.41
1991	12997.67	705.89	1.39	64.59	1307.95	648.38	-5.70
1992	13427.95	430.29	3.72	180.79	1853.48	545.54	-292.32
1993	14125.21	697.26	14.05	359.26	2446.57	593.09	-241.04
1994	15490.55	1365.33	11.15	199.57	3174.80	728.23	448.68
1995	15734.74	244.20	1.90	-823.88	2376.18	-798.63	1868.60
1996	15169.07	-565.67	13.53	-991.42	1869.48	-506.70	945.97
1997	14257.78	-911.30	139.38	-286.31	1610.78	-258.70	-226.91
1998	15507.39	1249.62	190.06	-35.17	1935.77	324.99	1149.85
1999	16449.66	942.27	179.60	-364.36	1634.38	-301.40	1787.62
2000	15600.56	-849.10	280.38	-305.83	1515.79	-118.59	-144.30
2001	14978.8	-621.76	78.53	-535.42	1305.63	-210.16	202.35
2002	16687.59	1708.78	52.30	739.25	1721.73	416.10	605.74
2003	18440.38	1752.79	268.29	131.64	2624.62	902.89	986.55
2004	19714.07	1273.70	448.91	-278.68	3221.76	597.14	1404.14
2005	18503.09	-1210.99	813.32	-173.74	2825.00	-396.75	172.83
2006	20160.93	1657.85	456.52	1196.06	3877.16	1052.16	-133.85
2007	21523.54	1362.61	651.03	856.79	5277.48	1400.32	-243.47
2008	23346.92	1823.37	1328.42	926.19	5787.36	509.88	1715.73
2009	25377.8	2030.88	901.29	3556.13	10341.54	4554.19	-5178.15
2010	26571.76	1193.96	1232.26	2108.50	11174.83	833.28	-515.57
2011	27046.08	474.33	1264.73	-161.84	9174.75	-2000.08	3900.98
2012	28282.4	1236.32	1584.40	2575.50	12754.23	3579.48	-3334.26
2013	31507.13	3224.73	2602.96	2058.47	18087.69	5333.46	-1564.24
2014	32665.58	1158.45	2539.19	755.79	22319.79	4232.10	-1290.25
2015	35966.56	3300.98	2831.15	2579.62	27493.08	5173.29	-1620.78
2016	38480.57	2514.01	2332.72	931.39	32283.84	4790.76	-875.41
2017	46819.12	8338.55	1810.40	-5984.99	33431.48	1147.64	14986.30
2018	52138.4	5319.28	2421.63	-7095.17	32028.38	-1403.10	16239.18
2019	57094.17	4955.77	1908.05	-2948.54	32696.94	668.55	9143.80
2020	67749.04	10654.88	1143.19	1192.77	43171.74	10474.80	130.50

Source: Author computation from data IMF, WDI.

Notes: KF= Capital Flight, ΔED= Change in External Debt, FDI= Foreign Direct Investment, CA= Current Account, FR= Foreign Reserve, EXID= Antilog of Interest Rate Differentials, PKF= Past Capital Flight.