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Determinants of Capital Flight in Bangladesh: an Econometric Estimation

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ABSTRACT
This study investigates the causes of capital flight from Bangladesh during the study period ranging from 1973 to 2013. Linear regression model has been used and the method of least squares (OLS) has been applied to estimate the various determinants on capital flight. The results illustrate external debt, foreign direct investment inflows, and foreign reserves to be the main causes of capital flight. Apart from Econometric Analysis, we have also shown that the other reasons of capital from Bangladesh includes economic crimes that generated through huge illegal incomes, whether from the willful default of bank loans, corruption in tax administration, manipulation in stock exchanges, over-invoicing and under-invoicing in trade settlements, leakage in public development expenditure, or illegal financial deals in the running of state-owned enterprises. Statistically we have proved that External Debt is the major cause of Capital Flight from Bangladesh. In future proper external debt management and utilization will be key strategy for Bangladesh Govt. to combat the capital flight from Bangladesh and also improving the foreign reserve can balance the lost capital or wealth from Bangladesh.
Keyword: Flight Capital, Unit Root Test, Multicollinearity Test, Heteroskedasticity, Correlation Matrix, ARCH Test.

Introduction

Capital Flight is a now-a-day a hot topic in print and electronic media of Bangladesh. With the list of the Bangladeshi investors name published in "Malaysia My Second Home" program of Malaysia Govt. and to know the list of Bangladeshi Account holders in Swiss National Bank initiate Bangladesh Bank to investigate how the money was transferred illegally from Bangladesh which actually gives me the initial boost to calculate the amount of capital flight from Bangladesh from the period 1973-2013 and econometric analysis of its major determinates from Bangladesh perspective.

The study is also motivated by the fact that Bangladesh has, of late experienced massive capital flight, especially since 1973 following a multitude of reasons ranging from macroeconomic instability (higher inflation, unsustainable government budget deficits, foreign debt etc) to political induced uncertainties (Polarized political environment; Political Party Members seem to be unsecured about wealth and business when they are in opposition)

Though Capital flight is not observable directly, it is assumed to be widely prevalent in the developing countries like Bangladesh. Generally, it means illegal conveyance of capital abroad violating the law of country of origin. The term capital flight is also viewed as a major factor contributing to the mounting foreign debt problems and inhibiting development efforts. There is no precise definition of capital flight that has wide acceptance. Different writers have viewed the term in different ways. In this paper I have adopted World Bank Broad Approach to measure the capital flight.

In this economic study of capital flight, the approach adopted is three-fold. The first is a discussion at the definitional/conceptual level, the rationale and the basis for classifying domestic outflows as capital flight instead of normal flows. The second approach involves a discussion and analyses of the conduits and economic determinants of capital flight. The third part is strictly empirical and deals with econometric estimation of the determinants of capital flight from Bangladesh, taking cognizance of the country-specific factors.

The Objectives of the Study are following:

1. Examine the size of capital flight from Bangladesh for the period 1973-2013 using the residual method.
2. Determinants of capital flight analyzed within the context of economic, socioeconomic and other

factors.

3. An econometric investigation of the determinants of capital flight.
4. Finally, provide policy conclusions drawn from the findings of the study.

LITERATURE REVIEW

Although capital flight has been a problem as early as the seventeenth century in Europe and in the early twentieth century in Europe and United States of America (**Kindleberger, 1987),** the subject matter in the contemporary world latter gained momentum again since the early 1980s. This renewed interest in the study of flight capital flight is a result of at least two reasons: the important role that external assets stored away in foreign lands can play if left in the domestic economy and the dwindling resources from international creditors in the past two to three decades **(Ajayi, 1992, 1995).** The paradox and severity of this problem is that in most developing countries which are riddled with heavy debt burdens, foreign exchange shortages, transient and chronic poverty, capital flight amounts to a substantial proportion of the very resources which are essential for financing economic growth and reversing the perverse economic trends **(Hermes et al, 2002).**

The long-term effects arising from lost resources due to capital flight are many. Firstly, capital outflow exacerbates the capital scarcity problem, that is, it compounds the lack of financial resources and infrastructure[1]. Thus, the availability of resources for domestic investment is reduced, causing a decline in capital formation, which in turn means a reduction in the country's current and future developmental prospects. Similarly, it restricts the capacity and ability of the affected country to mobilize its domestic assets and access foreign resources. Consequently, capital flight retards economic growth and development and contributes to underdevelopment **(Beja, Jr. 2006).** The fact that income and wealth generated are outside the purview of relevant authorities means that they cannot be taxed and the end result will be a reduction in government revenue as well as its debt servicing capacity. Evidence also shows that capital flight normally exacerbates balance of payment (BOPs) crisis during the time capital outflows are takes place. At the same time capital flight may also augment the foreign finance problems of heavily indebted poor countries if potential creditors and donors are de-motivated give further assistance as a result of capital outflows **(Ajayi, 1995).**

In a true sense, most studies on capital flight have been done for Latin America. **Cuddington and Conesa** for example emphasized the overall investment climate factors while Dooley focused on the discriminatory treatment of residents against non-resident capital. The study by **Ajyai** provided link between capital flight and external debt in Nigeria. He concluded that most capital flight from Nigeria is recorded in the balance of payments and debt statistics and that capital flow is explained by not only economic factors but also by political instability. **Valpy Fitzgerald and Alex Cobham** found that: a) In sub-Saharan Africa and the Middle East, 39 percent of domestic investors' portfolios are held abroad; b) Sudanese assets held abroad exceed the country's GNP; Nigeria's is equal and Kenya's at around 75 percent. The effect of a return of such (relatively) huge investment flows would be dramatic; c) 'Trade-faking', the deliberate under-invoicing of exports to and over-invoicing of exports from associated companies to present false accounts and accrue balances overseas, has severely distorting effects for some African countries and India'. **Varnan-Scneider (1991)** argue that "The political relations contribute to capital flight in developing economies in the following way : a) the structure of political institutions in many developing countries (giving rise to many sources of distortions and instability in the economy); b) the influence of political institutions on economic institutions; c) in many developing countries long-term objectives are forsaken for short-term objectives; d) policy announcements of the government commonly are not credible by the market; e) the absence of adequate measures of checks and balances; f) frequent changes in government regimes (each regime adheres to its own ideology); g) central banks in developing countries accumulate excessive foreign exchange reserves (the danger is that it signals or actually supports a disequilibrium exchange rate); and h) overvalued exchange rates in turn motivate capital flight since they lead to anticipations of a depreciation in the exchange rate and residents transfer assets abroad when the transactions are still favorable to them".

Meyer and Bastos Marques in ' A Fuga De Capital No Brasil' concludes that 'the accumulation of huge foreign debts allowed fiscal deficit, expansive monetary policy, and appreciated currency were the determinant causes of capital flight in Brazil.' **Israel Pinheiro** concludes that 'capital flight is a response to increases in country risks affecting both international and domestic capital. The method that international investors and part of the residents use to put their money abroad when the fear of financial crisis takes over their minds can vary from country to country depending upon the level of controls that are adopted. The more tightened and strict is the control, the more is the possibility of illegal transactions'. **Prakash Loungani and Paolo Mauro** summarized that 'the root causes of capital flight include political uncertainty, an uneven record of reforms, and institutional weaknesses, particularly corruption. They, after reviewing the capital flight case of Russia, suggested that 'the medium-term post-election strategy ought to include a timetable for the gradual phasing out of controls,

combined with a package of measures to improve governance and macroeconomic performance and to strengthen the banking system.'

Highlighting the Nobel Lauriate Economist **Amartya Sen's** entitlement approach and 1974 Bangladesh Famine, **Akhtar Hossain** argues that 'Although Sen was correct to raise a valid theoretical point, he did not go into depths to find out if there were any other reasons behind the smuggling of foodgrains, raw jute, and other essential products. To begin, it is to be noted that the smuggling of essential products from Bangladesh to India was not necessarily a normal commercial transaction based on the price differentials of those products. In all intents and purposes smuggling was a conduit of capital flight from Bangladesh to India'. He quoted **Rahim's** views in this regard. Rahim provided an interpretation of capital flight from Bangladesh (1973) in this way: 'in a two-way flow of smuggling, the composition of goods availability may change without altering the total availability. However, the form of smuggling that we have been experiencing in Bangladesh is not really in the form of illegal trade rather in capital flight. It is suggested that huge Bangladesh currency notes are being smuggled to foreign countries and sold at a discount. These currency notes are subsequently used for purchasing goods from Bangladesh resulting in a one-way outflow of goods from Bangladesh to abroad'.

Illegal capital flight or outflow is one of the most important characteristics of a hidden economy. The various aspects and extents of hidden economy of Bangladesh have been analyzed and examined by **Reza (1989), Barakat (1991), Hasan (1997) and Asaduzzaman (1998)** . These researchers estimated the size of the hidden economy at about 20% to 23% of GDP. These studies identified smuggling, under- and over-invoicing, and hundi business as major sectors, and suppression of gross receipts, and pseudonymous business as common methods for generating tax evaded income. They also identified pseudonymous financial investment as the most important form in which hidden wealth is held.

Peter Eiger observes that corrupt political elites in the developing world working hand-in-hand with greedy business people and unscrupulous investors promote private gains at the cost of the citizen's welfare and economic development of their countries. It is envisaged in a study that 'holding other things constant, if Bangladesh were able to reduce its corruption level to those of the least corrupt countries in the world (i.e., Canada, Denmark, Finland, Iceland, Netherlands and Sweden) its annual average per capita growth rate during 1973-2013 could have increased by between 2.12 and 2.88 percentage points.

As **Harrigan et al (2007)** puts it, the variety of capital flight definitions **(Cuddington 1986; World Bank 1985; Morgan Guaranty Trust Company 1986; Cline 1987; Dooley 1986; Lessard and Williamson 1987)** makes it difficult to separate normal capital outflows and flight capital outflows. Also these variety definitions mean that estimates of capital flight using different definitions yields different results.

Another subtle distinction being made in literature is between legal and illegal transactions as a means to try and distinguish between capital flight and normal capital outflow. Given the fact that illegal transactions by virtue of their activity are normally not reported to compliers of balance of payments (BOPs) statistics, it therefore becomes difficult to know the extent to which they constitute capital flight. **Walter (1987)** defines capital flight as ‘capital which flees’ involving international asset redeployments or portfolio adjustments due to significant perceived deterioration in risk–return profiles associated with assets located in a particular country. Although the legality or illegality of the activity might be debatable, the key issue is that there is a conflict between the objectives of asset holders and society **(Harrigan, 2007).** Alternately, capital outflows in response to economic or political crises are considered as capital flight.

Cuddington (1986,p.2) refers to capital flight as short-term capital outflows involving hot money that response to political or financial crises, burdensome taxes, a prospective tightening of capital controls or a major domestic currency devaluation as well as actual or developing hyperinflation. On the other hand, **Morgan Guaranty Trust Company (1986, p. 13)** defines capital flight to constitute the reported and unreported acquisition of foreign assets by the non-bank private sector and elements of the public sector.

Deppler and Williamson (1987) considers that capital flight to be motivated by residents’ fears of capital loss which tend to arise from risks of expropriation, debt repudiation or exchange rate depreciation, and from market distortions such as capital control, taxation and financial repression that would reduce the value of an asset as compared with its value if invested abroad. Conversely they also stressed that the non-flight capital outflows are generally not motivated by the intention to avoid large losses, but are prompted by attempts at maximizing returns through international portfolio diversification. Thus in their definition, for an outflow to be categorized as capital flight, the transfer of capital must be a response to losses and risks that are considered to be ‘large’ in relation to capital deployed.

In **Khan and Haque (1985)** defined capital flight in terms of domestic and foreign investors’ response to an asymmetric risk of expropriation. Assuming that there is no cost related to foreign investment, a two-way capital flow is observed where domestic investors invest abroad in order to avoid higher risk of expropriation while using foreign funds to finance domestic investment.

The above survey of literature on capital flight testifies to the fact that there are different views amongst economists regarding the concept and definition of capital flight. Nevertheless, it can be generally agreed that capital flight refers to capital that is running away from the domestic financial market in order to avoid losses and is in conflict with the interests, goals and objectives of the domestic society **(Harrigan, 2007).** To this end, this term paper's working definition interprets capital flight as consisting of private capital outflows of any kind motivated by the residents' (of any country) desire to reduce the actual and potential level of government control (including risk of expropriation) over such capital, as well to acquire foreign assets.

Some authors **(e.g., Harrigan et al, 2007)** dichotomize between direct and indirect approaches to the measurement of capital flight. The direct approach chooses certain variables that constitute capital flight and attains data directly for the variables. The indirect approach measures capital flight indirectly using a residual of some other variables. In general the indirect measure defines capital flight more broadly than the direct measure.

In general, the following measures of capital flight can be distinguished in the literature **(Claessens and Naudé 1993: 2-9):** (1) The Residual (or Broad) Method; (2) The Morgan Guaranty; (3) The Dooley Method; (4) The Hot Money Method; (5) The Trade Misinvoicing Method; and (6) The Asset Method. Since in this term Paper I adopt the Residual Method, below is a description of the Residual Method.

Residual Method

The **World Bank's (1985)** broad approach measures capital flight indirectly by comparing the sources of capital inflows (i.e., net increases in external debt and the net inflow of foreign investment) with the uses of these inflows (i.e., the current account deficit and additions to foreign reserves). Algebraically, this method expresses capital flight as follows:

KF = ΔED + FDI – CAD – ΔFR…….(1)

Where KF is capital flight according to the residual method, Δ denotes change, ED is stock of gross external debt reported in the World Bank or IMF data, FDI is the net foreign investment inflows, CAD is the current account deficit/surplus and FR is the stock of official foreign reserves.

This broadest definition of capital flight has the advantage of that it incorporates all the reported as well as unreported build-up of foreign assets for both public and private sectors **(World Bank 1985; Erbe 1985)** and thus would seem to be appropriate if one thinks that most of the funds used for capital flight would have been utilized for more productive and beneficial domestic investment activities. This definition therefore postulates that foreign asset increase is mostly associated with national disutility due to capital flight.

The Measurement of Capital Flight in Bangladesh using Residual Method

This section estimates the magnitude of capital flight from Bangladesh for the period 1973-2013. As has been pointed above, the estimates are based on the residual measure:

(Change in Debt + Net Foreign Direct Investment Inflow) — (Current Account Deficit/Surplus + Change in Official Foreign Reserves)

In terms of interpretation, positive KF means capital flight while negative KF means "reverse" capital flight. The study follows the convention in the literature by which capital flight is denoted with a positive notation, because capital flight is a form of foreign private assets accumulation. Thus "reverse" capital flight is like reducing foreign private assets, thus a negative notation. Note further that because the right hand side of Equation 1 contains variables that are considered officially recorded transactions, positive KF implies net unrecorded capital outflows and negative KF net unrecorded capital inflows.

Table 01: Capital Flight from Bangladesh: 1973-2013 (US$ Million & Current Exchange Rate)

Year	Changes in External Debt ΔED	Net Foreign Direct Investment (NFDI)	Current Account Surplus (CAS)	Change in Official Foreign Reserve (ΔFR)	Capital Flight(KF) [ΔED+ NFDI-CAS-ΔFR]
1973	351.317	2.340000	-35.18346253	-127.275546	516.1160085
1974	759.664	2.20000	-39.9005168	-4.995873999	806.7603908
1975	423.002	1.543333333	-130.9069767	10.06328378	545.3890263
1976	313.501	5.420000	-16.68604651	140.6537975	194.953249
1977	337.743	6.980000	-84.01808786	-47.41844598	476.1595338
1978	488.359	7.700000	-65.17054264	79.7658437	481.4636989
1979	146.98	-8.010000	-130.1162791	92.38109049	176.7051886
1980	835.157	8.510000	-154.3540052	-82.46092599	1080.481931
1981	407.089	5.360000	-233.5917313	-171.5019975	817.5427288
1982	731.016	6.960000	-82.11886305	48.84630369	771.2485594
1983	405.958	0.403978558	-88.24289406	337.3520493	157.2528233
1984	195.523	-.5532693983	-218.7080103	-137.7951554	551.4728963
1985	987.947	-6.660000	-195.6330749	-51.88724083	1228.807316
1986	1383.44	2.436499344	-181.2273902	78.65991813	1488.443971
1987	1823.879	3.205086762	-133.4108527	441.3929041	1519.102035
1988	536.121	1.838242499	-302.1963824	200.257408	639.8982169
1989	425.22	.2479082739	-346.2015504	-544.412681	1316.08214
1990	1586.87	3.238781189	-68.77260982	127.469494	1531.411897
1991	704.66	1.390444322	104.7416021	648.3793701	-47.07052788
1992	429.48	3.721853382	92.66149871	545.5356789	-204.9953242
1993	696.96	14.04988652	144.7157623	593.0909419	-26.79681768
1994	1365.19	11.14778833	-77.05426357	728.2292573	725.1627946
1995	244.28	1.896372127	-501.9379845	-798.6251343	1546.739491
1996	-565.16	13.52983154	-303.9922481	-506.6957148	259.0577944
1997	-910.57	139.3761531	-151.7312661	-258.7032276	-360.7593532
1998	1252.48	190.059373	-244.5219638	324.9945013	1362.066836
1999	942.18	179.6629703	-63.50129199	-301.3953715	1486.739634
2000	-848.72	280.3846297	-769.6770026	-118.5872898	319.9289221
2001	-671.86	78.52704008	119.121447	-210.1579759	-502.296431
2002	1708.65	52.33947335	25.62015504	416.1041042	1319.265214
2003	1752.63	268.2852318	240.8656331	902.8889197	877.160679
2004	1273.74	448.9054007	-304.3152455	597.1359301	1429.824716
2005	-1210.42	760.5042658	618.875969	-396.7547681	-672.0369351
2006	1656.97	728.6153417	828.6563307	1052.158550	504.770461
2007	1266.87	650.1806285	710.0516796	1400.315866	-193.3169171
2008	1579.73	1023.737397	1874.069767	509.8767451	219.5208849
2009	1666.42	823.6029516	2965.904393	4554.187605	-5030.069046
2010	1132.89	861.7362372	681.5633075	833.2830007	479.779929
2011	1574.61	1184.776059	2022.777778	-2000.074984	2736.683265
2012	-1195.9	1474.542605	2388.0000	3579.475296	-5688.832691
2013	-1511.4	1501.647072	1547.0000	5333.462786	-6890.215714

Table 01 shows in recent last two years the amount of capital flight from Bangladesh reduced officially, according to the BOP statistics and this mainly happened because of a sharp fall in external debt.

DATA AND METHODOLOGY

The data set is based on secondary data and drawn from different sources comprise time series data of Bangladesh period of 1973-2013. The data sources include annual reports of different government institutions, concerned ministries and concerned corporate offices, research journals, investment surveys conducted by BOI, statistical year book of Bangladesh. Data series on External Debt is taken from World Bank's International Debt Statistics. Net Foreign Direct Investment & Official Foreign Reserve series are taken from International

Monetary Fund (IMF)'s Balance of Payment Database and International Financial Statistics (IFS). Current Account Balance series is from Dept. of Statistics, Bangladesh Bank. To avoid the effects of exchange rate shocks, all data series are measured in United States of America dollars (USD/US$) & Current Exchange Rate used (1 USD = 77.40 BDT).

The econometric analysis in this study is two-fold: a) Test for stationary of the series used in the econometric model & checking multicollinearity b) Test of the existence of static long-run equilibrium relationship between capital flight and its determinants.

To test the stationary used Augmented Dickey Fuller Test and to check whether data series have multicollinearity and used Correlation Matrix and run Auxiliary Regressions and find out the Tolerance Factor (TOL). To test the existence of long run relationship among the Capital Flight and its determinants used OLS Regression and check the statistical significance using T Test Statistic and F Test Statistic.

Model Specification

Along the lines of the discussion regarding the various capital flight determinants in Chapter 2, the study proposes the following model of capital flight (with expected signs in front of the respective variables):

KF= C(1) + C(2)*EDC - C(3)*FDIF - C(4)*TFR…….(2)

Where

KF= Capital Flight using the Residual Method; **EDC** = Change in the External Debt; **FDIF**= Foreign Direct Investment Flows; **TFR** = Total Foreign Reserves;

C(1) = Intercept Parameter,C(1) is the value of the dependent variable (KF) when each of the independent variables takes the value zero.

C(2) = As per literature review, we expect there will be positive relationship between KF & EDC and thus the sign of the Parameter C(2) will be positive. C(2) explains the average change in Capital Flight when there is one unit change in Change in External Debt and other variables held constant.

C(3) = C(3) parameter explains the average change in KF due to one unit change in FDIF when other variables held constant. In literature there are dichotomies conclusions about the relationship between KF & FDIF. We follow the work by Chander Kent (1996) that concluded there is negative relationship between KF & FDIF.

C(4) = When Total Foreign Reserve increases, we get more foreign currency from the rest of the world and thus reduces the capital flight. So I hope the relationship between KF & TFR will be negative.

Result Analysis :

The Unit Root Test

Although there are a number of methods used to test for stationarity and the presence of unit roots, the methods used here are the Augmented Dickey-Fuller (ADF) and the By definition a series is stationary if it has a constant mean and a constant finite variance. On the contrary, a non-stationary series contains a clear time trend and has a variance that is not constant overtime. If a series is non-stationary, it will display a high degree of persistence i.e. shocks do not die out. A series X_t is said to be integrated of order d, denoted as I(d), if it must be differenced d times for it to become stationary. For example, a variable is said to be integrated of order one, or I(1), if it is stationary after differencing once, or of order two, I(2) if differenced twice. If the variable is stationary without differencing, then it is integrated of order zero, I(0). Table-1 provides unit root test results (ADF tests) and the tests indicate that all the variables are stationary at first difference, that is, they are I(1) variable except TFR and after second difference it becomes stationary, i.e. I(2).

Table-2: Results of unit root test:

SERIES	MODEL	AUGMENTED DICKEY FULLER (ADF) TEST		CONCLUSION
		LAGS	CALCULATED T-STATISTIC	
KF	Intercept	03	0.909556	Non-Stationary even at 10% Level of Significance
	Trend & Intercept	03	-0.170377	
	None	03	-0.059999	
EDC	Intercept	01	-4.693387	Stationary even at 10% Level of Significance
	Trend & Intercept	01	-4.566725	
	None	01	-3.464618	
FDIF	Intercept	00	1.633195	Non-Stationary even at 10% Level of Significance for Trend & Intercept
	Trend & Intercept	00	-0.281965	
	None	00	2.439997***	
TFR	Intercept	02	5.565175	Non- Stationary for Trend & Intercept for 10% Level of Significance
	Trend & Intercept	02	3.590270***	
	None	02	6.310524	
DKF	Intercept	02	-8.313217	Stationary even at 10% Level of Significance
	Trend & Intercept	02	-8.892215	
	None	02	-8.170492	
DEDC	Intercept	02	-6.847924	Stationary even at0 1% Level of Significance
	Trend & Intercept	02	-6.848512	
	None	02	-6.942311	
DFDIF	Intercept	00	-5.895616	Stationary even at 10% Level of Significance
	Trend & Intercept	01	-6.107451	
	None	00	-5.459610	
DTFR	Intercept	02	-0.929352	Non Stationary
	Trend & Intercept	02	-2.043236	
	None	02	-0.421985	
DDTFR	Intercept	01	-10.81023	Stationary even at 10% Level of Significance
	Trend & Intercept	04	-5.707856	
	None	01	-10.85074	

KEY: KF = Capital Flight, **EDC =** External Debt Changes, **FDIF** = Foreign Direct Investment Flows **TFR** = Total Foreign Reserve, **DKF** = First Difference of Capital Flight, **DEDC** = First Difference of External Debt Changes, **DFDIF** = First Difference of Foreign Direct Investment Flows, **DTFR** = First Difference of Total Foreign Reserve, **DDTFR** = Second Difference of Total Foreign Reserve.
***** Statistically Significant at 5% & 10% level.**

Multicollinearity Tests

Although the first difference regression model often reduces the severity of multicollinearity, we confirm that our time series data have no multicollinearity problem.

Correlation Matrix

Correlation matrix is one of the best techniques to detect multicollinearity. Now let's have a look at the following correlation matrix.

Table 3: Correlation Matrix of the independent variables

	DEDC	DFDIF	DDTFR
DEDC	1.000000	-0.314797	-0.051556
DFDIF	-0.314797	1.000000	-0.142287
DDTFR	-0.051556	-0.142287	1.000000

According to Table 3 it can be seen that correlation between EDC & FDIF is -0.314797 is the highest among all the correlation among the independent variables. So we can easily conclude that there is no severe correlation among the independent variables.

Auxiliary Regressions & Tolerance

Table 3 describe the results of auxiliary regressions and Tolerance of the independent variables.

Table 4: Result of Auxiliary Regression & Tolerance

Dependent Variable	R^2 Value	Tolerance (TOL)= 1-R^2
Change in External Debt (EDC)	0.108571	0.891429
Foreign Direct Investment Flows (FDIF)	0.124291	0.875709
Total Foreign Reserve (TFR)	0.030550	0.694500

The R^2 Values are lower than overall R^2 values and tolerance values are almost 0.90 for two variables (EDC & FDIF respectively) and 0.70 for TFR. Since we know Tolerance values equal to or close to zero means strong multicollinearity. So it can be conclude that data series are free from strong multicollinearity problem.

Tests for Heteroskedasticity

Homoskedasticity is an important property for OLS method. So it is important to find out whether there is any heteroskedasticity problem or not. To test heteroskedasticity, we have used the **"White Test ".**

White Test

The White Test result is shown in appendix-1, According to the white test result with (Observation* R^2)=26.92286 and χ (df=9) critical value at 5% Level of significance of 23.5893, we can clearly reject null hypothesis of Homoscedasticity. So, it can be conclude that data series have Heteroscedasticity problem and used White Robust Standard Errors to solve the Heteroscedasticity Problem.

ARCH Test

The result of ARCH Test is shown in Appendix 2 . Since the Probability Value of the test statistic (Observation* R^2) less than 5% we can reject the null hypothesis of Homoscedasticity and conclude that data series have Heteroscedasticity problem.

Estimation Results

The estimated results of the parsimonious long-run co-integration static equation presented in appendix 3, reveal that changes in external debt is the main significant determinant of capital flight in Bangladesh. Thus the results obtained quite clearly support the believed notion that external debt pushes capital flight and Foreign Reserve decreases the Capital Flight.

DKF=31.59635+0.89368*DEDC-0.57535*DFDIF-1.13083*DDTFR

From appendix 3 ,it is apparent that a US dollar increase in external debt changes is associated with approximately a 0.89 US dollar increase in real capital flight. This provides support for the hypothesis that external borrowing can directly cause capital flight by providing the necessary liquidity.

The long-run estimation indicates that the model fits the data well as evidenced by relatively high values of both R^2 (adjusted R^2) which is above 92 per cent, and F-statistic tests whose significant values is above 154. The adjusted R^2 which measures the "goodness of fit" of the equation (after taking account of degrees of freedom) is satisfactory high at 92 per cent, indicating that 92 per cent of the variations in capital flight from Bangladesh is explained by variations in the changes in external debt and TFR. The F-test statistic of 154.34, with a p-value of 0.00, indicates that the two variables jointly determine capital flight from Bangladesh in the long run.

we got FDIF's T Test Statistic Value less than 2 in absolute term. There is no statistically significant relationship between KF & FDIF which means for the data series I used for Bangladesh to calculate the capital flight, I found no statistically significant relationship between these two variables.

Conclusions and policy Implications

Capital flight is a part of hidden economic activities. Proper policy formulation and its strict application might check the illegal movement of capital from Bangladesh. If the financial system is developed, capital account is liberalized, tax evasion and hidden economic activities are reduced considerably, and the growth rate of formal GDP will increase to a great extent. The government will also be able to mobilize more resources from local sources and reduce its dependence on foreign aid. Government should improve the services sectors, ensure the transparency and accountability in administration, and enlarge the scope and opportunity for social justice and security, so that the people will pay taxes willingly and refrain from illegal activities.

In this study we investigated the causes of capital flight from Bangladesh for the period 1973 to 2013. The study found external debt and Foreign Reserve flows to be the most important determinant of capital flight in the long run. The significance and importance of external debt in fuelling capital flight suggests that external debt

provides the fuel and/or motivation for capital flight that has been presence in Bangladesh. Foreign reserves and FDI are the other determinants of capital flight and for Foreign Reserve it is significant in the long run.

These findings imply that debt relief strategies will bring long-term benefits to Bangladesh only if accompanied by measures to prevent a new cycle of external borrowing and capital flight. This will require substantial reforms on the part of both creditors and debtors to promote responsible lending and accountable debt management. On the other hand, better management of foreign direct investment inflow transactions is needed to avoid possible leakages of the same money going out as capital flight.

The following policy measures may be considered as part of reform processes of the on-going financial sector-strengthening project:

- The existing tax laws need to be changed. Tax holiday in investment declared by the government should be curtailed. The rate of income tax and VAT should be reduced. The tax officials should be honest with high moral integrity.
- Good governance system should be established at every stage of administration. Administrative and political transparency should be ensured.
- The banking activities, which are involved in transaction of foreign currency, should be brought under active surveillance of the central bank.
- The hidden wealth of the corrupt should be uncovered and invested in the industrial sectors. Effective measures should be taken against corruption both in private and public sectors
- Along with the modernization of financial and capital markets, a bond market should be developed with the availability of risk free instruments which will induce domestic as well as foreign investors to invest their capital through diversifying their portfolio investment in the country.
- To make this Department fully active and operative, the anti-money laundering measures adopted should be strengthened in line with other countries' experiences in restraining the capital flight. Co-ordination among the Bangladesh Bank, commercial banks, non-bank financial institutions, the Anti Corruption Commission, and law enforcement agencies is very much crucial.
- Government should establish mechanisms of transparency and accountability in its decision making process with regard to foreign borrowing and the management of borrowed funds.
- Bangladesh Bank may also make an effective plan to transfer banking surveillance or supervision responsibilities and functions to a separate and independent agency to ensure transparency and uphold public confidence, keeping the monetary policy responsibility in the central bank itself.
- Adequate regulation and supervision are necessary for guiding the banking system to work in a more efficient way.

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Appendices

Appendix-1

Heteroskedasticity Test: White

F-statistic	7.183114	Prob. F(9,29)	0.0000
Obs*R-squared	26.92286	**Prob. Chi-Square(9)**	0.0014
Scaled explained SS	48.05993	Prob. Chi-Square(9)	0.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Sample: 1975 2013
Included observations: 39

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	116206.9	82373.68	1.410729	0.1690
DEDC^2	-0.056706	0.058948	-0.961966	0.3440
DEDC*DFDIF	-0.389411	0.860791	-0.452387	0.6544
DEDC*DDTFR	0.139188	0.074095	1.878494	0.0704
DEDC	27.26142	106.1124	0.256911	0.7991
DFDIF^2	7.141556	3.951315	1.807387	0.0811
DFDIF*DDTFR	0.395996	0.461932	0.857260	0.3983
DFDIF	-1437.610	1001.441	-1.435541	0.1618
DDTFR^2	0.101813	0.019231	5.294269	0.0000
DDTFR	-246.5235	70.48880	-3.497343	0.0015

R-squared	0.690330	**Mean dependent var**	285876.3
Adjusted R-squared	0.594225	**S.D. dependent var**	609763.2
S.E. of regression	388421.9	**Akaike info criterion**	28.79413
Sum squared resid	4.38E+12	**Schwarz criterion**	29.22068
Log likelihood	-551.4855	**Hannan-Quinn criter.**	28.94717
F-statistic	7.183114	**Durbin-Watson stat**	1.556243
Prob(F-statistic)	0.000021		

Appendix-2

Heteroskedasticity Test: ARCH

F-statistic	9.826752	Prob. F(1,36)	0.0034
Obs*R-squared	8.148441	**Prob. Chi-Square(1)**	0.0043

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Sample (adjusted): 1976 2013
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	168229.2	98282.36	1.711693	0.0956
RESID^2(-1)	0.473183	0.150947	3.134765	0.0034

R-squared	0.214433	**Mean dependent var**	293383.5
Adjusted R-squared	0.192611	**S.D. dependent var**	616119.1
S.E. of regression	553612.7	**Akaike info criterion**	29.33751
Sum squared resid	1.10E+13	**Schwarz criterion**	29.42370
Log likelihood	-555.4128	**Hannan-Quinn criter.**	29.36818
F-statistic	9.826752	**Durbin-Watson stat**	1.902202
Prob(F-statistic)	0.003415		

Appendix-3

Dependent Variable: DKF
Method: Least Squares
Sample (adjusted): 1975 2013
Included observations: 39 after adjustments
White heteroskedasticity-consistent standard errors & covariance
DKF=C(1)+C(2)*DEDC+C(3)*DFDIF+C(4)*DDTFR

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	31.59636	104.6359	0.301965	0.7645
C(2)	0.893682	0.086097	10.37998	0.0000
C(3)	-0.575355	1.205601	-0.477235	0.6362
C(4)	-1.130834	0.117261	-9.643695	0.0000

R-squared	0.929722	**Mean dependent var**	-197.3584
Adjusted R-squared	0.923698	**S.D. dependent var**	2043.235
S.E. of regression	564.4005	**Akaike info criterion**	15.60632
Sum squared resid	11149177	**Schwarz criterion**	15.77694
Log likelihood	-300.3232	**Hannan-Quinn criter.**	15.66754
F-statistic	154.3395	**Durbin-Watson stat**	2.858533
Prob(F-statistic)	0.000000	**Wald F-statistic**	93.78626
Prob(Wald F-statistic)	0.000000		

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