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Dynamics of external debt and capital flight in India

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ABSTRACT

Countries at early stages of development have small stocks of capital and are likely to have investment opportunities with rates of return higher than those in advanced economies. The external debt for productive investment within reasonable levels enhances economic growth, but beyond certain levels additional indebtedness reduces growth. The mounting burden of debt servicing and debt crisis motivates capital flight, a paradoxical situation in which resources are flowing out of developing countries. This paper investigates the relationship between external debt and capital flight via TSLS (Two Staged Least Square Method). The results indicate positive relationship between external debt and capital Flight in India.

Key Words: Debt Crisis, Capital Flight, Revolving Door, Debt Sustainability

INTRODUCTION

The economic development of any nation requires interaction among various factors of production, e.g. natural resources, trained labour force, and capital. Among these, capital plays a noteworthy role and economists consider it as a growth engine of economic development. The neoclassical growth economists consider capital accumulation (accumulation of savings) as an essential ingredient of economic growth. According to them, rate of interest is the key to savings as also to investment. The other factors promoting output-expansion include population, technology, and international trade. Some economists consider borrowings appropriate to finance government expenditure which results in creation of productive capital assets. They neo-classists believe that foreign debt kills two birds with one stack by helping to bridge the saving gap and foreign exchange.

For developing/ emerging economies, there are various alternative means of finance economic development program of a country. These include savings, surplus from public undertakings, taxation, deficit financing, internal and external borrowings, and the foreign investment inflows. When there is a gap between domestic savings and investments, and foreign direct investment inflows are not significant, a country may resort to borrowing from internal or external sources.

External debt as a tool to promote economic growth had been one of the prominent topics of debate among economists. Neoclassical economists argue that external debt is one of the important sources of capital for a country and it has positive impact on investment and the economic growth. Some economists contradict this view; they consider external debt as one of the factors hampering economic growth. In support of their view they describe the problems associated with external debt, e.g. problem of debt accumulation, problem of debt sustainability, inability of a country to meet debt obligations, inability of a country to raise foreign loans in its

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own currency etc. Nevertheless, external debt nowadays has become an important source of finance in developing economies. Table 1 depicts the debt accumulation of developing countries.

TABLE 1: EXTERNAL DEBT OF DEVELOPING COUNTRIES

Year	External Debt Stock (US$ Billions)	Year	External Debt Stock (US$ Billions)
2005	2514.1	2008	3499.2
2006	2675.3	2009	3639.6
2007	3220.5	2010	4076.3

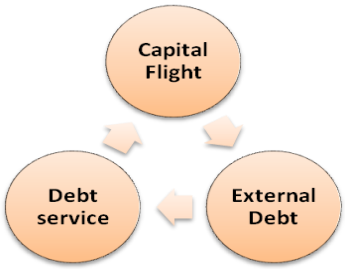
Source: Global Development Finance, 2012, World Bank

It is observed that most of the developing countries now-a-days are facing the problem of debt overburden. Debt problem for governments arises when their debt-servicing capacity does not keep pace with growth of debt. This is the situation when a country's external debt exceeds sustainable levels. If debt will be larger than the country's repayment ability, expected debt-service costs will discourage further domestic and foreign investment, and thus it will harm growth (Catherine, Poirson and Ricci, 2002). In India, main contributors of external debt accumulation are Current Account Deficit, Shortage of Foreign Reserves, Excessive Imports, and Currency Valuation Changes accounted to US$. The mounting burden of debt servicing and the possibility of debt crisis provide the motivation for capital flight. As the capital flees, it creates the financial vacuum and the country in turn will seek external resources to fill the void (Beja and Edsel, 2006). In this vein the relationship between external debt and capital flight is shown in figure 1.

Figure 1: Relationship between External Debt, Debt Service and Capital Flight

MEASURES OF CAPITAL FLIGHT ESTIMATES

The capital flight literature is full of dilemma of concise estimates and definition. There are various arguments in the term due to absence of universally accepted definition. According to Cuddington (1986), capital flight refers to short term capital outflows; it involves hot money that responds to political or financial crises, heavier taxes, a prospective tightening of capital controls also a major devaluation of the domestic currency or actual or incipient hyperinflation. Morgan Trust Company (1986) defined capital flight as the reported and unreported acquisition of foreign assets by the non-bank private sector and elements of the public sector. Buiter and Szegvari (2002) viewed that capital flight is the outflow of capital by rational investors searching for better risk-return trade-offs and portfolio diversification.



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Among various measures of capital flight, most significant (direct and indirect) were given by Dooley (1986), Morgan Trust Company (1986), Cuddington (1986), Khan and Haque (1985) and the Residual Measure introduced by the World Bank (1985). However, the most popular measure is of World Bank which relies on the indirect definition of capital flight. Capital flight represents the difference between sources of capital (new external borrowing, new inflow of foreign direct investment, and exports of goods and services) and uses of capital (outflow of foreign direct investment, imports of goods and services, and official foreign reserves change). Mathematically, capital flight can be written as (see table 2):

REVIEW OF LITERATURE

Economic literature is well documented with causes and effects of capital flight and external debt. According to Walter (1986) and Kindleberger (1987), capital flight is a capital that flees. When these resources are being lost in form of capital flight, there are various long term effects. Owing to out flow of capital there exists a shortage of liquidity in the economy which leads to the exertion of upward pressure on the interest rates. Similarly, the shortage of liquidity can cause a depreciation of the domestic currency, ultimately leading to macroeconomic instability.

TABLE 2 : CAPITAL FLIGHT ESTIMATES	
World Bank: A+B+F+H	Erbe: A+B+F+H
Morgan: A+B+E+F+H	Duwendag: A+B+F+G+H +I+M
Cline: (A+B+E+H)-(J+K+L)	
Notions	
A: Current Account Balance	H: Changes in Debt
B: Net Foreign Direct Investment	I: IMF Credit
C: Private Short Term Capital Outflows	J: Travel Credit
D: Portfolio Investment	K: Re Invested FDI in Income
E: Banking System Foreign Assets	L: Other Investment Income
F: Changes in Reserves	M: Counterpart Items
G: Errors and Omissions	
Source: Lessard and Williamson, 1987	

Throwing light on causes of capital flight, Beja (2007) stated that short term inflows of capital and external borrowing in developing countries are the main causes of capital flight. Brada et al. (2009) were of the view that capital flight can be triggered by illegal actions to hide money laundering activities such as drug distribution. Dornbusch (1984) explored sources of debt and debt difficulties for a group of Latin American countries using the data set of budget deficit, macroeconomic instability, and terms of trade deterioration from 1945-1983. The results revealed that the role of disequilibrium in exchange rates and budget deficit promotes external indebtness. Cumby and Richard (1987) argued on ambiguous situation of capital flight and suggested a new definition of capital flight, which requires a somewhat arbitrary distinction between normal capital flows and those representing capital flight.

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Pastor (1989) explored cause and effect of capital flight by using OLS technique and taking the determinants for the time period 1973-86 among Latin American countries, such as change in inflation rate, financial incentives, increase in taxes, country growth, degree of capital availability. Ajayi (1995) examined size, magnitude, causes and linkages of capital flight with external debt in Nigeria during 1970-88 and found that domestic policy distortions accounts to capital flight.

Onwioduokit (2001) used OLS on capital flight data from Nigeria during period from 1970 to 1996. He found increase in domestic interest rates and economic growth as factors reducing capital flight, and increase in inflation, exchange rate premium, and foreign interest rates as factors increasing capital flight. Menbere (2004) in his study applied panel data approach separately for 21 Highly Indebted Poor Countries (HIPCs) and Least Developed Countries (LDCs). He found that poverty (the savings gap), income instability, and external factors such as debt service payments and capital flight as main causes of overseas borrowing by developing countries during 1980s and 1990s. Makochekanwa (2007) also used OLS to investigate causes of capital flight from Zimbabwe during the period 1980-2005. The result indicated external debt, foreign direct investment inflows, and foreign reserves to be the major causes of capital flight. Economic growth was found to be negatively correlated with capital flight.

Hamed (2012) analyzed the estimated amount of capital flight and its effect on macroeconomic variables such as growth, foreign debt, and inflation in Iran. Estimation results of VAR model and Johansen Convergence test during 1979-2010 revealed that, capital flight has a negative and significant effect on economic growth, while its effect on foreign debt and inflation is not significant. Bolaji et al. (2012) in a study on implications of capital flight on investment growth in Nigeria during 1970-2006 observed that there exists long-run interaction between capital flight on investment growth. William (2013) also described estimates of capital flight among the Portugal, Italy, Greece and Spain (PIGS) during the current Euro zone debt crisis and presented capital flight determinants of the troubled PIGS countries. These included Terms of Trade, Inflation, Euro, Ten Year Government Notes, and Government Surplus. Demachi (2013) analyzed the influence of international resource price movements on capital outflows from 21 resource-rich developing countries (RRDCs) during 1990-2011 by distinguishing capital flight and capital transfers. The results of analysis suggested the need to focus on Capital outflow from RRDCs through transnational companies.

Some researchers like, Boyce (1992), Ajayi (1995) and Beja and Edsel (2006) hypothesized direct linkages between external borrowing and capital flight. They reviewed the cases of Indonesia, Malaysia, the Philippines and Thailand. By using granger causality technique on data for the period 1970-2002, and taking variables such as change in debt, debt stocks and estimates of capital flight, they concluded that large sums of capital flowed in and out of these four countries were in a revolving door process. In case of India Chippalkatti and Risihi (2001) hypothesized the revolving door hypothesis in Indian environment taking time series data set from 1971-1996, and confirmed the hypothesis by using two stage least square technique (2 SLS).

The debt-flight linkage establishes the association between two variables which may be attributable to poor economic management and track records of debtor governments. Morgan Guaranty Trust Company (1986) in a study revealed that indirect factors such as low growth regimes, overvalued exchange rates and poor fiscal management by third world governments not only cause capital flight but also generate demand for foreign credit. In the same vein, Henry (1986) stated that external borrowing may trigger conditions that motivate residents to engage in capital flight. Lessard (1987) viewed that debt disbursements were signal to an increase in probability of a fiscal crisis and thus induce capital flight. Similarly, Conesa (1987) stated that the provision of external debt to a country provides upward pressure on its currency, therefore stimulates the residents to dollarize their assets before an expected devaluation. Boyce and Ndikumana (2011) also analyzed determinants of capital flight including linkages to external borrowing. The results confirm that Sub-Saharan Africa is a net creditor to the rest of the world in that the subcontinent's private external assets exceed its public external liabilities. This finding suggests the existence of widespread debt-fuelled capital flight. The results also shows a debt overhang effect, as increases in the debt stock spur additional capital flight in later years.

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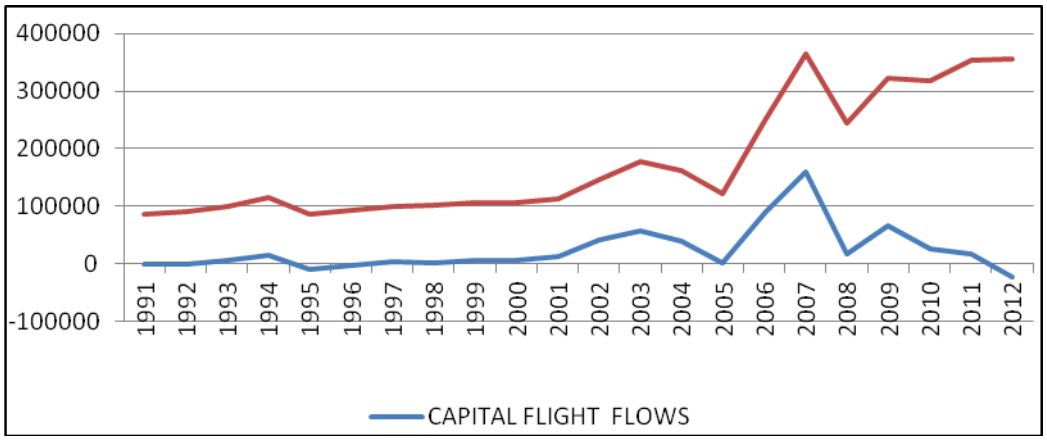
In nutshell, most of the researchers who studied relationship between external debt and capital flight in Resource-Rich Developing Countries (RRDCs), Highly Indebted Poor Countries (HIPCs), Least Developed Countries (LDCs), Portugal, Italy, Greece and Spain (PIGS), and Sub-Saharan Countries are of the view that there exists significant association between external debt and capital flight. However, there is no discussion on relationship between external debt and capital flight in Indian context for a long period of time. The researchers feel need to examine this relationship in India in post liberalization period.

CAPITAL FLIGHT AND INDIA'S EXTERNAL DEBT

When capital flees from an economy, the country in turn depends on foreign resources (external debt) to finance its development program. Further, when the country repays the debt, the capital again flees from the economy in the name of debt service. Boyce and Nikumana (2001) pointed out that very poor countries have become net lenders to the rest of the world. The capital flows in India present a paradoxical situation. On one hand India has experienced mounting burden of debt, on the other considerable capital outflows are recorded. Figure 2 (Table 3, see appendix) shows the volume of capital flight and external debt in India during 1991-2012.

Figure 2: Capital Flight and Gross External Debt in India



Source: Authors Computation

METHODOLOGY

A number of studies (Beja and Edsel, 2006, Ajayi, 1995, Boyce, 1992, Chippalkatti and Risihi, 2001) have hypothesized and confirmed the bidirectional causal relationship between external debt and capital flight in countries like Nigeria, Latin America, India, and Philippines. The researchers also explained the revolving door hypothesis between Capital Flight and External Debt.

This hypothesis states that external debt is determined by capital flight and capital flight is also determined by external debt. We have simultaneous –equation issues, which can be checked through Hausmen specification test.

When there is a Simultaneity problem, the OLS estimates produce consistent and efficient estimators. On the other hand, if there is simultaneity, OLS estimators are not even consistent in the presence of simultaneity. The method of two staged least square (2SLS) and instrumental variables (IV) will give estimators that are consistent and efficient.

To test the relationship between external debt and capital flight the researchers used following econometrics tools.

http://dx.doi.org/10.19085/journal.sijmd030203

Augmented Dickey-Fuller (ADF) Unit Root test of stationary in time series data,

Hausmen Specification test of simultaneity, and

Two Stage Least Square (TSLS) technique. When there is no simultaneity between variables under consideration, TSLS is used. In such type of cases the result produced by Ordinary Least Square (OLS) are biased and inconsistent. (Gujarathi, 2012)

The study considers Gross External Debt as dependent variable, and the set of independent macroeconomic variables viz., Capital Flight, Foreign Direct Investment, Current Account Deficit, Foreign Exchange Reserves, and Changes in External Debt. The brief description of selected variables with their source is given in table 5.

TABLE 5: VARIABLES DESCRIPTION

Date Frequency: Yearly Data From 1991 to 2012 No. of Observations: 22

Label	Data Description	Source
Dependent Variable		
LEXD	Log of Gross External Debt	IFS (International Financial Statistics)
Independent Variables		
LCF	Log of Capital Flight	Authors' Calculation
FDI	Log of Foreign Direct Investment	WDI (World Development Indicators)
LCAD	Log of Current Account Deficit	IFS (International Financial Statistics)
LFRE	Log of Foreign Exchange Reserves	WDI (World Development Indicators)
LCEXD	Log of Change In External Debt	WDI (World Development Indicators)

DATA ANALYSIS

The summary of basic descriptives of variables under consideration is presented in table 4 (see appendix). In this table sample mean, standard deviation, skewness and kurtosis, and the Jacque Bera statistic and p-value have been reported. The high standard deviation of NET FDI flows with respect to the mean is an indication the high volatility in Net FDI flows. The p-values more than 0.05 indicate that change in external debt and net FDI flows are normally distributed at 5 percent level of significance.

Augmented Dickey-Fuller (ADF) Unit Root Test: Unit Root test, a test of stationarity is required before applying Granger Causality test on selected time series data. Of various unit root tests available in econometrics, researchers used Augmented Dickey Fuller (ADF) test for checking stationarity in selected variables. The test is based on the null hypothesis that the variable contains a unit root, and alternative hypothesis is that the variables are generated by a stationary process. The model form of ADF test is as follows.

$$\Delta y_t = \alpha + \beta_{y_{t-1}} + \delta t + \zeta_1 \Delta y_{t-1} + \zeta_2 \Delta y_{t-2} + \cdots + \zeta_k \Delta y_{t-k} + \epsilon_t$$

http://dx.doi.org/10.19085/journal.sijmd030203

In the above equation, yt is the time series data under consideration, k is the number of lags, t is a time and ϵ_t denotes the error term.

TABLE 6: RESULTS OF ADF UNIT ROOT TEST

Variables	ADF Test Statistics	Critical Value at 1%	Probability Value	Order of Integration	Remark
LCAD	-3.88315	-4.46789	0.0318	I (1)	Stationary
LCF	-3.727649	-4.498307	0.0440	I (1)	Stationary
LEXD	-3.805327	-4.498307	0.0381	I (1)	Stationary
LFERE	-5.407930	-4.440739	0.0013	I (0)	Stationary
LCEXD	-5.778096	-4.532598	0.0009	I (1)	Stationary
LNFDI	-6.576667	-4.467895	0.001	I (1)	Stationary

Source: Author's Computation

The null hypothesis (Ho) of the existence of a unit root is, $\delta=0$. The decision rule for the ADF Unit Root Test states if probability of Z(t) is less than 0.05, the time series is said to be stationery, otherwise it is considered as non-stationery. The results of unit root test presented in table 6 indicate that p value of considered variables under consideration is less than 0.05, hence are stationery. Consideration of lag length is priori in unit root testing E-views provide it automatically, here lag length is considered four according to SIC criterion.

Hausmen Specification Test: Hausmen Specification test is conducted through E-views in two steps. In first step, the researchers have to run OLS regressors with all possible variables and retrieve residuals, and step two re-estimates the first OLS equation with residuals as additional regressors. If results of OLS estimates are consistent, the coefficient on the first stage residual should be equal to zero, if not, the problem of simultaneity persists (Gujarati, 2012).

Step 1: Estimate OLS with all possible Instrumental variables and regressors.

The researchers considered LCF only as regressor as LCF is aggregate of all possible variables considered in the study.

No. of Observations: 22

Dependable Variable	Constant	LCF	R2	DW
LEXD	-0.487129	-0.094359	0.074198	0.820491

Source : Author's computation

Step 2: Re-estimation of first OLS equation with residuals as additional regressors.

No. of Observations: 22

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Dependable Variable	Constant	LCF	Residuals	R2	DW
LEXD	-0.487129	-0.094359	1.0000	1.000000	1.546742
Source : Author's computation					

Since the coefficient on first stage residual is not equal to zero, there exists issue of simultaneity. To encounter this issue the researchers performed Two Stage Least Square (2SLS) through E-Views. The results (See Notes) indicate that there exists problem of simultaneity between LEXD and LCF and the results are consistent with revolving door hypothesis. So to allow the simultaneity between LEXD and LCF the system of equation is estimated with TSLS (Two Stage Least Square).

Two-Stage Least Square (TSLS): TSLS is a special case of instrumental variables regression. As the name suggests, there are two distinct stages in two-stage least squares. In the first stage TSLS finds the portions of the endogenous and exogenous variables that can be attributed to the instruments. This stage involves estimating an OLS regression of each variable in the model on the set of instruments. The second stage is a regression of the original equation, with all of the variables replaced by the fitted values from the first-stage regressions. The coefficients of this regression are the TSLS estimates. More formally, let be the matrix of instruments, and let and be the dependent and explanatory variables. The linear TSLS objective function is given by:

$$\Psi(\beta) = (y - \chi\beta)' z(z' z)_{-1} z'(y-\chi\beta)$$

$$bTSLS = (x' z(z' z)_{-1} x' z(z' z)_{-1} z' y,$$

$$\Sigma TSLS = S2\ (X'Z(Z'Z)_{-1}\ Z'X)_{-1}$$

Here, S2 is the estimated residual variance (square of the standard error of the regression). In this study the researchers used Terms of Trade and Interest Rate as instrumental variables. These variables are found stationary using Augmented Dickey-Fuller Unit Root Test (ADF). The debt flight linkage has been modeled as a system of equations to counter the simultaneity problem between the dependent variables (external debt and capital flight).

The literature on relationship between capital flight and external debt shows that Current Account Deficit, Exchange Rate and Foreign Exchange Reserve are some of the important determinates of capital flight and external debt. The literature indicates the influence of these variables in determining countries external debt accumulation and capital flight. Table 7 reveals the summary of the estimated results. The model specifications of the relationship are depicted in equation 1 given below.

$$LEXD_t = \alpha 0 + \beta LCFt + \beta LCADt + \beta LFREt + \beta LCEXDt + \beta FDIt + \mu \text{---------- (1)}$$

TABLE 7: TWO-STAGE LEAST SQUARES (2SLS)				
Sample (Adjusted): 1991 - 2012 No. of Observations: 22 Convergence achieved : 28 iterations				
Dependable Variable	Constant	LCF	R2	DW

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LEXD	0.015402	0.022983	0.262773	1.436017
Instrument specification: LEXD (-1) LCF (-1) *Constant added to instrument list *Lagged dependent variable and regressors added to instrument list *Estimated equation: LEXD = C(1) + C(2)*LCF + [AR(1)=C(3)]				
Source: Author's computation				

Table 7 depicts the effect of external debt on Indian economy within the scope of the formulated model. The coefficient of the dependent variable LEXD at zero level of all the explanatory independent variables is given as 0.015402. This indicates a positive relationship between the constant parameter and LEXD. The results also exert a positive relationship between the LEXD and LCF. The coefficient of log capital flight (LCF) shows that there is a positive relationship between the LEXD and the log capital flight (LCF) and one percent increase in capital flight will lead to increase 0.022983 percent change in LEXD.

The coefficient of multiple determination (R2) 0.26 indicates that about 26% of the total systematic variations in the LEXD (External Debt) is explained by the variation in all the explanatory LCF (Capital flight) variable. The remaining 74% could be attributed to the stochastic error term not included in the model. Thus, the analysis shows that there exist positive relationships between the LCF and LEXD.

CONCLUDING REMARKS

In nutshell, the behavior of capital flows in India presents a paradox. On one hand, India is experiencing mounting indebtness flows, and on the contrary, it is experiencing capital outflows in the name of capital flight. The results indicate that simultaneity persists among external debt and capital flight in India. This advocates the possibilities of revolving door hypothesis in post liberalization period in India. Finally, the external debt and capital flight in India is significantly derived by current account deficit, foreign reserves and foreign direct investment.

NOTES

Hausmen specification test is performed to test the issues of simultaneity; simultaneity is a situation where independent variable (Y) is determined by dependent variables (X) in turn some of dependent variables are also determined by independent variables(Y). In nutshell there exists a two way relationship. Here this relationship is regarded as revolving door hypothesis.

Hausmen specification test can be performed in E- views in two simple steps. In first step run OLS with all possible (IV) instrumental variables, regressors and retrieve residuals. Secondly, re estimate the first OLS equation with residuals as additional regressors. If results of OLS estimates are consistent ,then coefficient on the first stage residual should be equal to zero if not then the problem of simultaneity persists .

Instrumental variables are those variables which are correlated with regressors and uncorrelated with error term. In e views one has to test relationship through two stage least square technique (TSLS). Instrumental variables (IV) variables are required as much explanatory variables used. Any variable can be used as instrumental variables (IV.) For simplicity variables such as LCF and LEXD are used as instrumental variables (IV) in this study.

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Appendix

Table 3 : Estimates of Capital Flight — Million US$

Year	Current Account Balance (A)	Net Foreign Direct Investment (B)	Change in Foreign Reserves (F)	Change in External debts (H)	Capital Flight Estimates (A+B+F+H)	Total External Debt Flows
1991	-4292	73.537638	1978.54	1202.719	-1037.2	86864.15
1992	-4485	276.51244	1922.797	2797.584	511.8939	89661.74
1993	-1875	550.37002	5135.843	3393.651	7204.864	93055.39
1994	-1676	973.27147	9546.301	6552.783	15396.36	99608.17
1995	-5563	2143.6281	-1356.29	-4434.566	-9210.23	95173.61
1996	-5956	2426.057	2024.728	-263.255	-1768.47	94910.35
1997	-2965	3577.33	3496.007	-209.39	3898.947	94700.96
1998	-6903	2634.6517	2261.193	4073.259	2066.103	98774.22
1999	-3228	2168.5911	5358.73	1288.862	5588.183	100063.1
2000	-4601	3584.2173	5053.768	1067.31	5104.295	101130.4
2001	1410	5471.9472	7991.779	-1631.31	13242.42	99499.08
2002	7059	5626.0395	22557.02	6242.53	41484.59	105741.6
2003	8773	4322.7477	32129.34	13143.011	58368.1	118884.6

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2004	780	5771.2972	27893.94	4759.859	39205.09	123644.5
2005	-10284	7269.4072	6193.685	-2449.007	730.0856	121195.5
2006	-9299	20029.119	40224.96	38330.048	89285.13	159525.5
2007	-8076	25227.741	98528.31	44532.01	160212.1	204057.5
2008	-30972	43406.277	-19155.4	23055.967	16334.87	227113.5
2009	-25922	35581.373	27260.16	29198.73	66118.26	256312.2
2010	-51781	27396.885	15797.26	35338.323	26751.47	291650.6
2011	-62517.6	36498.655	-1740.66	45194.268	17434.63	336844.8
2012	-91471.2	23995.685	1686.032	42254.54	-23535	379099.4
Source: Authors Compilation from WDI (World Development Indicator) and IFS Year Book (Various Issues)						

TABLE 4 :BASIC DESCRIPTIVE No. of Observations: 22

Particulars	Change in External Debt	Change in Foreign Reserves	Current Account Balance	Capital Flight Estimates	External Debt Flows	Net FDI Flows
Mean	13338.09	13399.46	-14265.68	24244.84	153523.2	11772.97
Median	4416.559	5247.286	-5082.000	10223.64	103436.0	4897.347
Maximum	45194.27	98528.31	8773.000	160212.1	379099.4	43406.28

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Minimum	-4434.566	-19155.37	-91471.24	-23534.98	86864.15	73.53764
Std. Dev.	17382.56	23263.92	24588.89	40364.75	88497.06	13822.94
Skewness	0.839699	2.312639	-1.937004	1.973647	1.372762	1.060142
Kurtosis	2.053165	9.296197	5.970630	7.008879	3.550579	2.637055
Jarque-Bera	3.407135	55.94902	21.84653	29.01456	7.187615	4.241723
Probability	0.182033	0.000000	0.000018	0.000001	0.027493	0.119928
Source: Author's Computation.						

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