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Saving-Investment or Foreign Exchange Gap: What Hinders Fiscal Stability in Pakistan?

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ABSTRACT

Macroeconomic stability is a major objective to be achieved for sustainable economic growth. However, fiscal stability has been prone to instability in dual gaps in a developing country like Pakistan. This study examines the impact of the saving-investment gap (SIG), foreign exchange gap, and the mediating impact of output on fiscal deficit (FD) using the time-series data from 1973 to 2018 in Pakistan using the Autoregressive Distributed Lag Model. The results show that an increase in the SIG and output lower the FD and assure fiscal stability. However, an increase in the foreign exchange gap increases the FD and hinders fiscal stability. The interaction term of the SIG and output impacts negatively while the interaction term of the foreign exchange gap and output positively impacts the FD. The study implies that the twin deficit holds in the context of Pakistan's economy, and the government may strategize to increase injections and reduce leakages for a sound fiscal position.

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INTRODUCTION

Fiscal stability has a central position in macroeconomic growth and sustainability. Sustainable growth requires macroeconomic balance in major macroeconomic variables like fiscal deficit (FD), current account, savings, and investment. Pakistan economy has been facing adverse fiscal conditions since its birth. Higher FD is due to a lack of investment, higher imports, lower exports, energy crises, and heavy reliance on foreign inflows (Ministry of Finance, 2021). Internal and external shocks exerted pressures on foreign exchange, FD, and SIG. The average gross domestic product (GDP) growth rate remained stagnant at around 2.5 percent per annum in the last two decades. The fiscal gap, forex gap, and SIG of Pakistan's economy are widening.

Pakistan is facing fiscal instability for a longer time. Many researchers identified different determinants and dimensions of it. Apart from the forex gap-FD relationship as proposed by the twin's deficit hypothesis, the wider SIG causes fewer capital formations and hence less production in the

economy. Leakages cause output to fall (Gunter et al., 2021) while injections cause output to increase and expand economic activity (Makiela & Ouattara, 2018). The literature is deficient to explain the empirical relationship between leakages and injections regarding mediating the impact of output on the fiscal situation of the economy.

This study empirically verifies the twin deficit hypothesis in the context of Pakistan's economy. The recent literature is deficient to quantify the direct impact of output on FD and mediating the impact of output on the forex gap-FD relationship. The present research study is different from the previous literature in the sense that it is not concerned with causality analysis, but it identifies whether the forex gap or SIG causes fiscal imbalances. Furthermore, the study is a pioneering attempt to quantify the direct and mediating impact of output on the forex gap-FD and SIG-FD relationship in the context of Pakistan's economy.

The study comprises of 5 sections: The section 1 highlights the significance, research gap, and contribution to the literature. Section two shed light on the similarities and difference in the existing literature. Section three enlightens the theoretical model and econometric methodology to analyze the data. Section four presents the results and discussions. Section six discusses the conclusion and policy implementations.

LITERATURE REVIEW

In literature, the relationship between budget deficit (BD) and current account deficit (CAD) has been widely discussed as the twin deficit hypothesis (El-Khishin & El-Saeed, 2021; Helmy, 2018). The twin deficit (a rise in BD causes CAD and vice versa) accompanying the SIG is called the triplet hypothesis (Szakolczai, 2006). The triplet hypothesis suggests that the BD along with the SIG impact the CAD (Bacha, 1990; Bayramoğlu & Öztürk, 2018; Okafor et al., 2022; Tang, 2014; Taylor, 1994). An outdated study is found on the 3-gaps hypothesis by (Iqbal et al., 2000) in the context of Pakistan's economy. However, (Khan & Saeed, 2012) empirically examined the twin-deficit hypothesis in Pakistan economy and found a positive relationship between BD and CAD in the short and long run. Murwirapachena et al., (2013) termed FD as an economic problem instead of a poor governance issue.

Economic growth plays a key part in determining the association between fiscal stability and the forex gap. Keynesian asserts that FD is beneficial for economic growth while neo-classical suggests that it hinders economic growth (Baskaran & Feld, 2013; Hussain & Haque, 2017). Many studies suggested a negative impact of FD on output (Alagidede et al., 2018; Hussain and Haque 2017; Kirchner and van Wijnbergen 2016; Rana and Wahid 2017). Mohanty (2019) examined the link between FD and CAD. He concluded that FD causes CAD. However, Ravinthirakumaran et al. (2016) found causality running from the CAD to the FD. The literature also advocates that there may not exist any connection between BD and CAD (Suresh & Tiwari, 2014).

(Akbaş & Lebe, 2016) analyzed the case of G7 countries and found the bi-directional causality between the SIG and BD and the SIG and CAD. The CAD and BD also showed bi-directional

causality. Savings impact the output positively when savings are higher than investment, and impact negatively when investment is higher than saving in developing countries (Gocer et al., 2016). Ganioğlu and Yalçın (2015) emphasized that an increase in domestic savings finances domestic capital and improves the macroeconomic performance of developing countries. Leakages have a strong impact on the trade deficit and cause crowding out of the investment (Cheelo Mujuta, 2013). The CAD and SIG pose severe threats to fiscal stability (Holcombe & Mills, 1995).

Manzoor et al. (2019) find that trade deficit impacts BD positively. The persistent CAD creates foreign exchange crises and is a major threat to fiscal stability. In Pakistan, savings and investments are extremely low and the impact of the SIG on the FD can be positive or negative. Pakistan is dependent upon foreign inflows and they satisfy the domestic demand for foreign currency (Makoto, 2020). Private capital flows augment domestic capital and positively impact economic growth (Alley, 2015).

RESEARCH METHODOLOGY

Theoretical Model

Macroeconomic variables like income, consumption, savings, taxes, government expenditures, investment, exports, and imports are central to fiscal stability from a Keynesian perspective. According to the Keynesian school of thought, aggregate demand-side management is a better measure to combat recession and economic slowdown. The macroeconomic performance is associated with an upsurge in exports, a decrease in imports, a surge in savings and investment, and a reduction in the FD. The FD is linked with the SIG and net exports by leakages and injection equation. Equating the leakages and injections of an economy,

$$S_t + T_t + M_t = I_t + G_t + X_t \quad (1)$$

FD, primary deficit, and BD terms are used synonymously in the literature. However, FD represents the actual position of the government receipts and outlays (excluding borrowings) for a particular year. In other words, it is equal to the sum of primary deficit and interest payments on outstanding debt. Rearranging the variables.

$$(G - T)_t = (S - I)_t - (X - M)_t \quad (2)$$

Equation 2 expresses that the primary deficit is always equal to the SIG minus the forex gap. However, leakages cause output to fall (Gunter et al., 2021) while injections cause output to increase and expand economic activity (Makiela & Ouattara, 2018). Therefore, the theoretical model may include the interaction terms to estimate the mediating impact of output. The schematic representation of the variables is given in figure I.

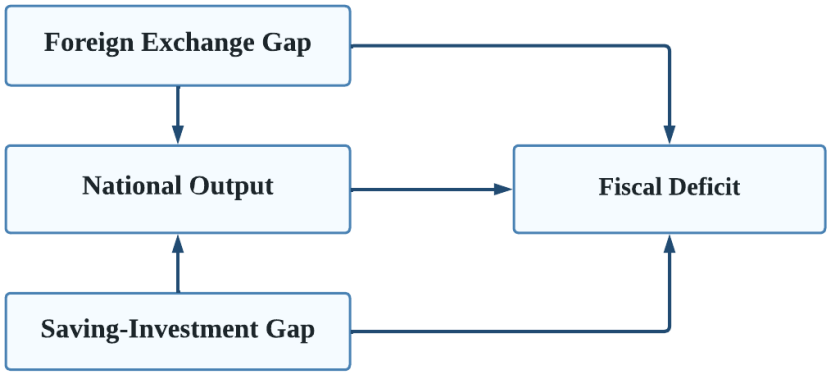

Figure I: Theoretical Model

For the sake of a better measure of deficit, the primary deficit is replaced with a FD treating interest payments on outstanding debt as government expenditures. The SIG is the excess of gross domestic savings over total investment and the shortfall is met by foreign resource inflows. The excess of the import bill over the export bill may be called a forex gap. A forex gap occurs when currency outflows (import bill) exceed currency inflows (export bill) over a longer period, and this can happen when a country is running a persistent CAD.

Hypothesis Development

Manzoor et al. (2019) find that trade deficit impacts BD positively. Some other researchers also confirmed that twin deficits are positively related to each other (Kalou & Paleologou, 2012) (Holmes, 2011). It means the higher the CAD, the higher will be the BD, and vice versa. This may be mentioned as a twin deficit may hold. Writing the null and alternative hypotheses.

H_{01}: *Foreign exchange gap does not increase the FD.*

H_{a1}: *Foreign exchange gap increases the FD.*

The second important argument is the mediating impact of output on FD. In a consumption-oriented society like Pakistan, a rise in income will increase imports causing the CAD. This shows that output mediates the association between the CAD and the BD. Çatik et al. (2015) confirmed that the CAD and BD are affected by macroeconomic activity. The null and alternative hypothesis of mediation impact is written as.

H_{02}: *Output negatively mediates the association between the forex gap and FD.*

H_{a2}: *Output positively mediates the association between the forex gap and FD.*

The SIG has greater prominence in the three gap analyses. However, it has strong implications for the FD as well. (Akbaş & Lebe, 2016; Şen et al., 2014) confirmed the bidirectional causality between the SIG and BD. Based on causality analysis, the hypotheses are written as.

H_{03}: *SIG causes the FD to fall.*

H_{a3}: *SIG causes the FD to rise.*

Ganioğlu and Yalçın (2015) emphasized that a rise in domestic savings finances domestic capital and improves the macroeconomic performance of developing countries. The findings of this study confirm that output is central to the link between the SIG and FD. In a similar study by (Gocer et al., 2016), the SIG impacts the output positively when savings are higher than investment, and impact negatively when investment is higher than saving in developing countries. The hypotheses for mediating the impact of output are given as under.

H_{04}: *Output negatively mediates the SIG-FD relationship.*

H_{a4}: *Output positively mediates the SIG-FD relationship.*

Some studies suggested bidirectional causality between FD and economic growth (Veiga et al., 2016; Lee & Ng, 2015; Makin & Layton, 2021). (Mawejje & Odhiambo, 2020) identified the critical macroeconomic determinant of FD and emphasized that output is an integral component of FD, and it has prominence either in Keynesian or Classical school of thought. It is hypothesized that output negatively impacts the FD.

H_{05}: *Increase in output causes the FD to rise.*

H_{a5}: *An increase in output causes the FD to fall.*

Empirical Model

Write the theoretical model in the logarithmic statistical form and add output as a mediating variable.

$$LGT_t = \lambda_0 + \lambda_1 LSI_t + \lambda_2 LXM_t + \lambda_3 LY_t + \lambda_4 LSI * LY + \lambda_5 LXM * LY + u_t \quad (3)$$

Alphas represent the intercept and coefficients of equation 4. The FD is the primary deficit plus interest payments on borrowings. To check the long-run relationship and cointegration among the variables, two equations of the ARDL model are assessed. The first equations explain the long-run relationship at various lags. Writing equation 3 in the ARDL framework,

$$\begin{aligned}\Delta LGT_t = \omega + \textstyle\sum_{i=1}^{l1} \alpha_i \, \Delta LGT_{t-1} + \sum_{i=0}^{l2} \beta_i \, \Delta LSI_{t-i} + \sum_{i=0}^{l3} \gamma_i \, \Delta LXM_{t-i} + \sum_{i=0}^{l4} \Omega_i \, \Delta LY_{t-i} + \\ \textstyle\sum_{i=0}^{l5} \lambda_i \, \Delta(LSI * LY)_{t-i} + \sum_{i=0}^{l6} \pi_i \, \Delta(LXM * LY)_{t-i} + \rho_1 LGT_{t-1} + \rho_2 LSI_{t-1} + \\ \rho_3 LSM_{t-1} + \rho_4 LY_{t-1} + \rho_5 (LSI * LY)_{t-1} + \rho_6 (LXM * LY)_{t-1} + \varepsilon_t \quad (4)\end{aligned}$$

Where, $\alpha_i, \beta_i, \gamma_i$, Ω_i, λ_i, and π_i are short run coefficients and ρ_i long-run coefficients. l1, l2, l3, l4, l5, and l6 are the lags used for the variables. The Akaike information criteria are used for the lag selection of each variable. The alternative hypothesis testing the level relationship is:

$\boldsymbol{H_A}$: $\rho_1 \neq \rho_2 \neq \rho_3 \neq \rho_4 \neq \rho_5 \neq \rho_6 \neq 0$

The error correction model (ECM) is estimated for the short-run relationship. It helps to estimate the *speed of adjustment* toward the equilibrium level. The ECM of ARDL is represented as,

$$\Delta LGT_t = \omega + \sum_{i=1}^{l1} \alpha_i \, \Delta LGT_{t-1} + \sum_{i=0}^{l2} \beta_i \, \Delta LSI_{t-i} + \sum_{i=0}^{l3} \gamma_i \, \Delta LXM_{t-i} + \sum_{i=0}^{l4} \Omega_i \, \Delta LY_{t-i} + \sum_{i=0}^{l5} \lambda_i \, \Delta(LSI * LY)_{t-i} + \sum_{i=0}^{l6} \pi_i \, \Delta(LXM * LY)_{t-i} + \eta ECT_{t-1} + e_t \quad (5)$$

Here, η is the coefficient of ECM representing the speed of adjustment towards equilibrium. Time series data of Pakistan for all variables from 1973 to 2018 have been taken from the SBP and the Pakistan Bureau of Statistics. The data is measured in million rupees and the base year is taken 2000-01. All variables are tested for stationarity first as proposed by (Dickey & Fuller, 1979) and (Phillips & Perron, 1988). The CUSUM test is used to test the stability of the regression relationship proposed by (Brown et al., 1975).

RESULT AND DISCUSSION

Results

There is a moderate correlation between FD and all explanatory variables. The FD has a negative linear association with the SIG and output gap. The strength of a linear relationship is the same showing that foreign inflows are equally important as the domestic increase in output. On the other hand, FD has a positive linear association with the foreign exchange gap. However, the degree of linear association is lower as compared to the SIG and output. The pairwise correlation matrix is given in table I.

Table I: Correlation Matrix

	LGT	LSI	LXM	LY	LSI*LY	LXM*LY
LGT	1.000					
LSI	-0.549	1.000				
LXM	0.241	0.441	1.000			
LY	-0.543	0.129	-0.185	1.000		
LSI*LY	0.405	0.961	0.497	-0.113	1.000	
LXM*LY	-0.165	0.402	0.951	-0.365	0.529	1.000

The ADF and PP test results at the level form of variables are given in table II and show that all variables have a different integration order. The SIG is stationary at the level form and hence I(0) while FD, foreign exchange gap, and output (GDP) are I(1). The method of ARDL is suitable if the variable has a different order of integration. ARDL is also suitable for small samples (Ghatak & Siddiki, 2001). The AIC used for optimal lag length.

Table II: Unit Root Test

Variable	ADF test		PP test		Decision
	Without trend	With trend	Without trend	With trend	
LGT	-3.5163 (-4.9281)	-2.4404 (-3.1900)	-3.6690 (-3.9281)	-3.2019 (-3.5130)	I(1)
LSI	-3.2716 (-2.9281)	-3.3340 -3.1900	-3.4144 (-2.9281)	-3.4664 (-3.5130)	I(0)
LXM	-0.7032 (-2.9281)	-1.5358 (3.1900)	-2.0640 (-2.9281)	-2.0448 (-3.5130)	I(1)
LY	-0.3560 (-2.9281)	-1.4725 (3.1900)	-0.6072 (-2.9281)	-1.6209 (-3.5130)	I(1)

Note: 5 percent Critical values in parenthesis

The estimates of the long-run equation show that the SIG and mediating impact of output are significant at a 0.05 level while the foreign exchange gap and output are significant at a 0.10 level. The SIG has a strong negative impact on the FD while the foreign exchange gap has one to one positive relationship with the FD. A rise in output causes savings and investment to rise and hence a fall in the FD. The output effect of the foreign exchange gap is positive and significant. A rise in output causes net exports to fall i.e., an increase in imports, hence increasing the FD. Most importantly, the output effect on FD is negative as suggested in the literature. The mediating impact of output on FD via saving investment is negative and via forex gap is positive. The estimates of the long-run ARDL (3,3,3,1,2,2) are given as.

$$LGT = 0.38 - 2.52LSI + 1.11LXM - 0.31LY - 0.26(LSI*LY) + 0.18(LXM*LY) \quad (6)$$
$$(.355)\ (.001)\quad (.072)\quad (.064)\quad (.001)\quad (.047)$$

The p-values are given in the parenthesis of equation 6. The results depict that there exists a significant long-run association. ARDL-bound testing confirmed the hypothesis of long-run relationships at a 0.05 level. The F-statistics and W-statistics of bound testing lie above the upper bound value rejecting the null of no-level relationship. The F and W-statistics estimates for the existence of a level relationship among the variables are given in table III.

Table III: Testing for the existence of a level relationship

Test-statistic		Lower Bound[£]	Upper Bound[£]
F-statistic	7.9550	2.9351	4.2471
W-statistic	47.7302	17.6108	25.4826

[£]0.95 level

The short-run coefficient of the SIG is negative. The foreign exchange gap except at first lag and output is insignificant. Again, the interaction terms are significant at the first lag. The ECT is significant at 0.01 level and represents a 1.38 percent adjustment towards equilibrium per period due to a 1 percent increase in explanatory variables. The coefficient of determination is high and shows 77 percent variations explained in the short run. The estimates of ECM are given in table IV.

Table IV: Estimates of ECM

Regressor	Coefficient	t-Ratio [Prob]
dLGT1	.62049	3.8547 [.001]
dLGT2	.24961	1.5767 [.126]
dLSI	-1.195	-1.308 [.201]
dLSI1	1.9217	3.0671 [.005]
dLSI2	.17068	2.3201 [.028]
dLXM	.40152	.56225 [.578]
dLXM1	-2.134	-2.131 [.042]
dLXM2	.17840	1.8245 [.079]
dLY	.19461	1.0131 [.320]
dLSI*LY	.06252	1.0397 [.307]
dLSI*LY1	-.1174	-2.636 [.014]
dLXM*LY	-.0074	-.1588 [.875]
dLXM*LY1	.15818	2.2401 [.033]
ecm(-1)	-1.386	-6.662 [.000]
R-Squared 0.775	F-Stat 0.5.66 [.000]	D-W statistics 2.13

The validity of estimates is determined by verifying serial correlation, functional form, normality, heteroskedasticity, multicollinearity, and structural breaks. The multicollinearity is observed by the value of the R-square and t-stat of coefficients and their standard errors. These measures suggest no multicollinearity in the data. The serial correlation is verified by the LM test based on residuals and F versions. Ramsey RESET test is used for functional form. Heteroscedasticity is verified by using regression of squared residuals on squared fitted values while normality is based on skewness and kurtosis test of error term. Both test statistics suggest no serial correlation, correct functional form, no heteroscedasticity, and normally distributed residuals. The CUSUM of squared residuals and histogram of residuals confirmed the structural stability of coefficients and normality assumption. The CUSUM test placed in the appendix shows that the parameters do not have any structural breaks and are constant over the sample analyzed. All these measures proved that the results are valid and satisfy the basic assumptions of the regression. The estimates of all these tests are placed in table V.

Table V: Diagnostic Tests

Test Statistics	LM Version		F Version	
A: Serial Correlation	χ^2 (1)	.51881 [.471]	F (1,22)	.26868 [.609]
B: Functional Form	χ^2 (1)	3.6188 [.057]	F (1,22)	2.0216 [.169]
C: Heteroscedasticity	χ^2 (1)	.23772 [.626]	F (1,41)	.22792 [.636]
D: Normality	χ^2 (2)	.10006 [.951]		

A: Lagrange multiplier test
B: Ramsey's RESET test
C: Based on the regression of squared residuals on squared fitted values
D: Based on a test of skewness and kurtosis of residuals

Discussions

In earlier studies, it is established that a FD causes a CAD (Kalou & Paleologou, 2012; Mohanty, 2019). However, in the present study, the foreign exchange gap impacts fiscal stability negatively. It

shows that a rise in the foreign exchange gap will increase the FD due to higher import demand. The governments are unwillingly forced to borrow from domestic, international finance, and development institutions to keep the pace of economic growth unaffected. The findings validate the twin's deficit hypothesis that persistent CAD impacts the FD (Ravinthirakumaran et al., 2016). In a consumption-oriented society, output plays a dominant role in the foreign exchange gap-FD relationship. It exerts further pressure on meager forex reserves and acerbates the FD. An increase in output increases the income level of the people. This causes a higher demand for goods and services which in turn increases imports and causes foreign exchange crises (Çatik et al., 2015). The findings are consistent with (Alagidede et al., 2018; Kirchner & van Wijnbergen, 2016) that the CAD further increases the FD.

The findings show that the wider SIG negatively impacts the FD. It means that a rise in the SIG lowers the FD due to the increase in net foreign inflows (Makoto, 2020). An increase in foreign inflows increases the availability of funds in the domestic market for investment purposes. Higher domestic savings and investment cause capital formation which impacts economic growth positively (Alley, 2015). As the study findings showed the positive mediating impact of output via saving-investment, is also confirmed by (Gocer et al., 2016). An increase in domestic savings finances domestic capital and improves the macroeconomic performance of developing countries. However, the findings (Akbaş & Lebe, 2016) suggested bidirectional causality between the SIG and BD, the SIG, and CAD, and CAD and BD. To finance the domestic borrowing needs, the government may increase domestic savings (Ganioğlu & Yalçın, 2015). The findings show that an increase in economic activity enhances the output which reduces the FD. The study confirms that output is an integral determinant of FD following the Keynesian view (Mawejje & Odhiambo, 2020). Hussain and Haque (2017) claimed that if the FD is sustainable, it may impact the output positively. However, in the literature, it is observed that unsustainable deficits reduce the output and cause output to fall due to higher interest payments.

CONCLUSION AND POLICY IMPLEMENTATION

Fiscal stability is omnipotent for sustainable economic growth and development. Without finances, the countries face forex and investment crises. The government always closely monitors the changes in the behavior of fiscal variables and a well-timed policy response may help to avoid such pitfalls. According to the data manipulated, the results revealed that the SIG, output, and output effect of the SIG lowers the FD. While the impact of the foreign exchange gap and the output effect of the foreign exchange gap widens the FD. The study concludes that the SIG, output, and output effect of the SIG assures fiscal stability while the foreign exchange gap and output effect of the foreign exchange gap destabilizes the fiscal performance of Pakistan’s economy. The study contributes that the twin’s deficit hypothesis may hold for the case of Pakistan's economy. Secondly, it identifies that output has a mediating impact on FD via channels of foreign exchange gap and SIG.

The study suggests some policy implementations that need to be implemented by the Government of Pakistan to overcome the issue of FD. The following initiative may be taken by the government to overcome the issue of fiscal instability.

- More emphasis is given to leakages and injections in the economy. Because higher leakages will lead to the undesirable outcome and will cause fiscal instability.
- The imports may be restricted either by raising tariffs, and quotas or encouraging them to localization of imported items. This step will be helpful for financing deficits. The governments may restrict the imports of final goods except for capital goods and essential inputs used in the production process.
- The government may take initiative for better facilities for exporters and domestic producers. The conducive environment to increase productivity will raise exports. This will reduce the foreign exchange gap and hence reduction in the primary deficit.
- The government may take initiative to retain domestic investors and attract foreign investors. This will increase the foreign inflows and will meet the domestic demand for foreign currency.
- Output, SIG, and forex gap are responsible for the fiscal stability of Pakistan. However, political, and institutional factors are ignored in the present study.

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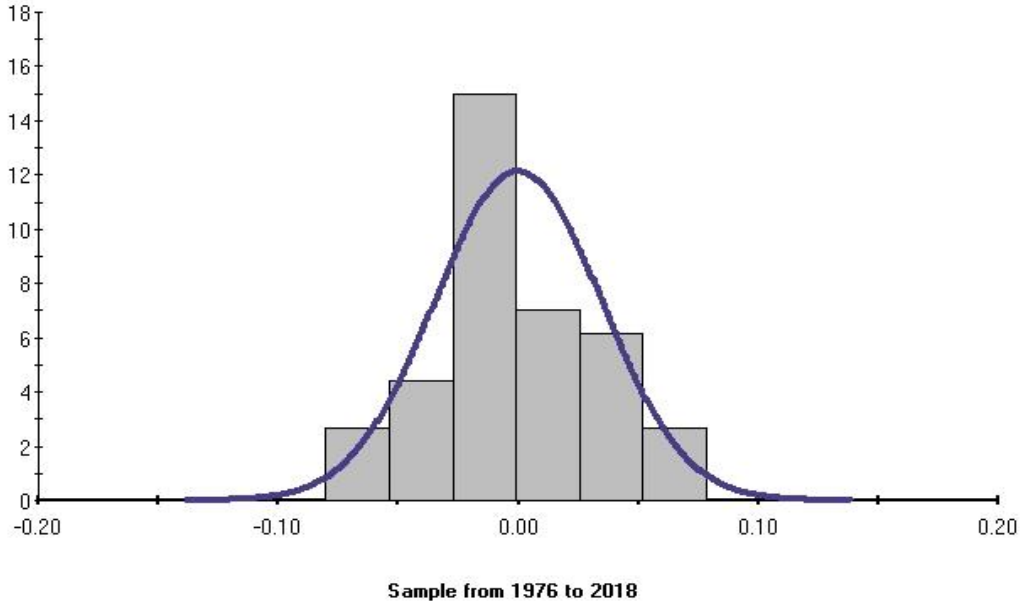
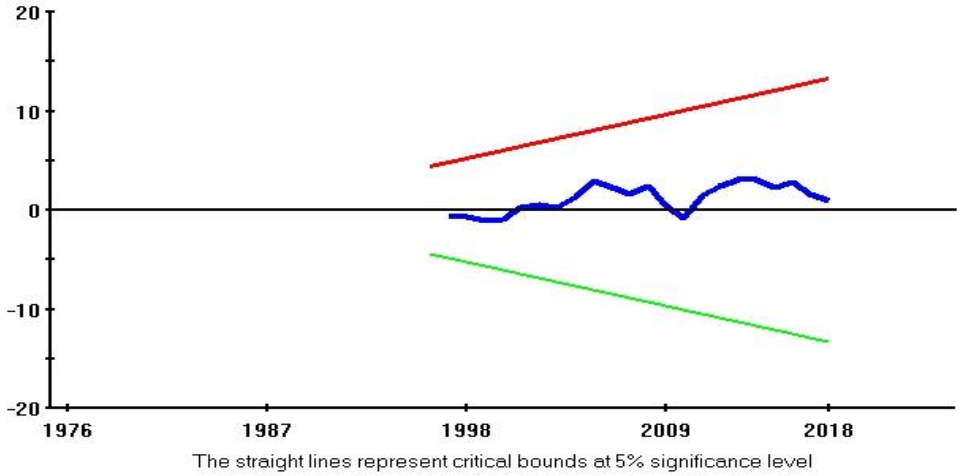
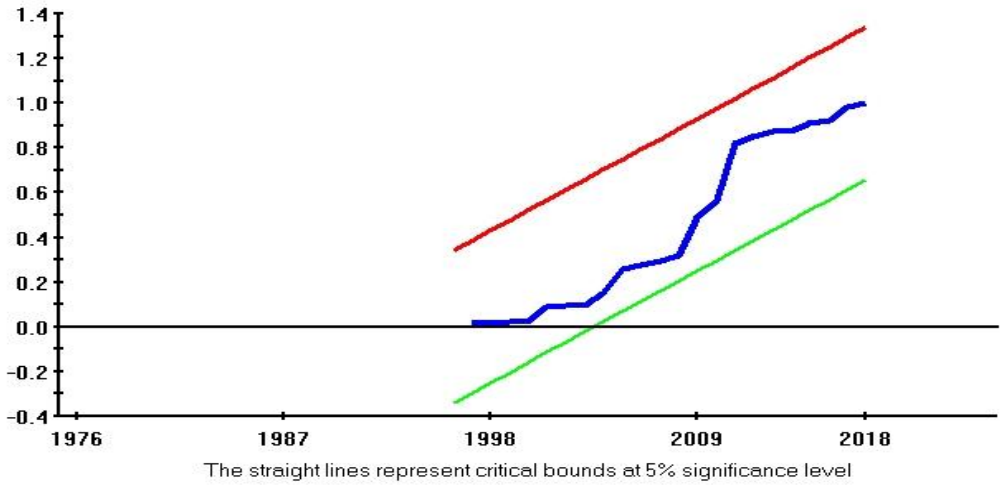
Appendix:

A: Histogram of Residuals



B: Plot of CUSUM



C: Plot of CUSUM Square