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The Effects of Devaluation of Currency on Economic Growth: The Mediating Role of Current Account Deficit

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Contents

Abstract: *This study explores whether Pakistan's current account deficit acted as a mediator in the linkage between the devaluation of the currency and the expansion of the economy from 1972 to 2016. All the variables have been shown to have a heterogeneous order of integration by using the Augmented Ducky Fuller (ADF), Phillips-Perron (PP), and Ng-Parron unit root tests. As shown in this article, the Autoregressive Distributive Lag Model (ARDL) is used to figure out how the variables are linked. The results clearly demonstrate that the current account balance fully mediates the relationship between devaluation of the currency and economic growth with a coefficient value of -0.12. Findings show that devaluation of the currency negatively affects the current account balance and economic growth. Moreover, through an indirect channel, the devaluation negatively affects the current account balance, which hampers economic growth.*

Key Words: Devaluation, Economic Growth, Autoregressive Distributed Lag Model (ARDL)

JEL Classification:

Introduction

Research Background

The international monetary fund's initiatives for macroeconomic stability and structural reforms include a devaluation of the country's currency as one of the reform measures. Many under-developed countries (UDCs) have implemented such programs under the regulation of the IMF. There are various channels through which currency fluctuations affect the inflation and growth of a country. For many reasons, Least Developed Countries (LDCs) depreciate their currencies. The LDCs devalue their currency in order to increase the level of output, which would raise their per capita income and improve the standards of living of their population so that they can narrow the development gap with the developed nations. Most developing countries face the problem of a foreign trade deficit. Most of them use the policy of devaluation to correct the foreign trade deficit. The use of devaluation has been a major point of disparity between The International Monetary Fund and a number of emerging economies, Since the 1980s, the IMF's attitude has become very strict towards currency devaluation. Some economists believe that devaluation is an important tool for strengthening the balance of payments (BOPs). Others believe that devaluation has little effect on the BOPs'

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current account, but it does reduce real output and raise inflation.

Some economists such as, Fang (2009) and Kalyoncu (2008) are of the opinion that the import and export elasticity in developing countries is quite low; hence devaluation may not be particularly advantageous in such nations. However, Edwards (1986), Upadhyaya (1999), Gylfason & Risager (1984), and Naqvi (1983) suggest that imported goods are affected by devaluation more than exports. The majority of nations see a strong growth rate when their currency is undervalued. Undervaluation is considered to be the best economic policy for developing economies exclusively; as of late, it is no longer the best economic policy for wealthy nations. Bhalla (2007) has expressed a similar viewpoint (Rodrik, 2008).

Different researchers having looked into it the possible link between Depreciation of currency and rising prosperity in various countries across the globe (Khan, 1995; Hasan & Khan, 1994; Borensztein & Gregorio, 1999; Acar, 2000; Fang & Miller 2006; Shahbazet, 2007; Berthou, 2008; Javed & Farooq, 2009; Kharroubi, 2011; Ratha, 2010; Genye, 2011; Thorbecke & Kato 2011; Li, et al., 2011; Few research, including (Khan, 1994; Ratha, 2010; Fang & Miller, 2005; Acar, 2000; Berthou, 2008), found negative relation between currency devaluation and economic growth. However, the majority of empirical research has not reached a definitive conclusion about the potential relationship between currency devaluation and economic growth. Hasan & Khan (1994), Shahbaz, (2007), Javed & Farooq (2009), in the case of Pakistan, Genye (2011) For the specific example of Ethiopia, Rapetti (2011) For the specific example of developed nations, Thorbecke (2011) in the case of Japan, Aydın, & Esen (2016) in the case of Nigeria, and Sahin & Mucak (2014) in the case of Turkey, among others, found a strong direct link between currency devaluation and economic growth. As Genye (2011) utilized time series data from 1980 to 2010 to analyze the effects of devaluation on Ethiopia's GDP per capita growth. In addition to the exchange rate, the author considered education, private investment, and openness to determine the growth of Ethiopia's GDP per capita. The author came to the conclusion that the effects of devaluation changed over time because of its detrimental influence on GDP per person growth concurrently with that year but a strong direct influence on the exchange rate the next year.

Exchange Rate, Current Account Balances and Economic Growth

The exchange rate is a key macroeconomic determinant that determines an economy's trade balances. The fluctuating exchange rates impede trade. Moreover, high exchange rate volatility destabilizes capital flows and discourages investors from investing; as a result, the growth process is badly impacted. Instability in the currency rate influences long-term decisions by affecting the volume of exports and imports, the distribution of government spending, and investment. In the medium term, it influences economic activities and the balance of payments. Instability in exchange rates dissuades investors from investing in their local currency; instead, they prefer to invest in international currency (dollar) to receive a greater return on their investment. As a result, the dollar strengthens against the local currency, which has a direct impact on the prices of exportable and importable commodities of the domestic country as well as their economic growth. Risk-averse investors always prefer a stable exchange rate, but risk-seeking investors prefer a volatile exchange rate so they can maximize their earnings from high-risk investments. For this reason, exchange rate volatility can have negative effects on imports and positive effects on exports for traders with a high risk tolerance and vice versa for investors with a low risk tolerance. What happens when the current account strays from its baseline, the current account deficit or surplus becomes problematic and the outlook for global imbalance reduction receives more focus, As long as the current account progresses to its fundamental level, current account imbalances are a normal occurrence, and current account imbalances are

immediately repaired at no cost. In contrast, the adjustment of current account imbalances necessitates significant economic costs when the current account continually reverts from equilibrium. The organization of exchange rates is essential for resolving the current account imbalances. According to Mussa (2005) and Edwards (2007), misaligned exchange rates are the primary determinant of current account imbalances. However, there is no unanimity in the academic literature that current account imbalances are the result of misaligned exchange rates. In fact, Gnimassoun & Mignon (2013) and Kharroubi (2011) emphasize the significance of the exchange rate in the occurrence of trade deficits. Blanchard and Giavazzi (2002), On the contrary, you could argue that the primary source of trade deficits is not a misalignment of exchange rates but rather a loss of equilibrium between saving and investing.

In economies with limited transaction between companies in the same industry, the sensitivity of the susceptibility of trade surpluses and deficits to changes in the currency rate is significantly lower than in economies with large intra-industry trade. It is doubtful that its imports will decrease much because of the fall in the value of its currency, because it cannot produce import alternatives that have become more expensive. The majority of imports from nations with low intra-industry trade are often raw materials, oil, and other natural resources. Typically, these nations have focused on particular industries to obtain a comparative advantage in a few sectors. The trade balances of countries with a lot of trade between industries, on the other hand, are much more sensitive to a falling exchange rate because they can quickly make import substitutes that have become more expensive.

The influence of currency depreciation on various macroeconomic activities is one of the most contentious questions in economics. Numerous studies have shed light on the causal correlation between currency depreciation and increased economic activity. However, the vast majority of empirical research has not arrived at a conclusive conclusion in terms of the total impact of depreciation on economic expansion. The researcher has disregarded the topic of potential indirect effects of depreciation on economic expansion. This research's primary objective is to analyze the direct and indirect effects of currency devaluation on growth in the Pakistan's economy. This study investigates whether macroeconomic factors such as the current account deficit mediate the relationship between currency devaluation and Pakistan's economic growth. The primary concern of this research is to determine whether or not the current account deficit has major part in in the correlation between the devaluation of the Pakistani rupee and the expansion of the country's economy from 1972 to 2016.

Examining how a drop in currency value affects growth in the context of Pakistan from 1972 to 2016 is the main focus of this study. Moreover, this investigation determines the mediating role of Current Account Deficit in the connection between Devaluation of Currency and the progression of Pakistan's economy from 1972 all the way up to 2016.

Theoretical Framework

The theoretical background of the connection between devaluation of currency and economic growth is divided into three main approaches. The pioneer work of Bickerdike (1920) and Robinson (1947) focused on the elasticity approach, which mainly states that devaluation of currency deteriorate the exports in the immediate future, but, in the distant future, volume of exports (J-curve phenomena). Contrary to the elasticity approach, Frenkel and Johnson (1976) argued that devaluation affects real value of cash balance and hence it is a monetary phenomenon (The monetary approach). On the other hand, the absorption approach follows the Keynesian analysis focused on economic aggregates and states that and improvement in trade balance is due to the surplus of home-based earnings over living costs (Absorption approach). In Keynesian framework devaluation of domestic currency has a big and favorable effect on the expansion

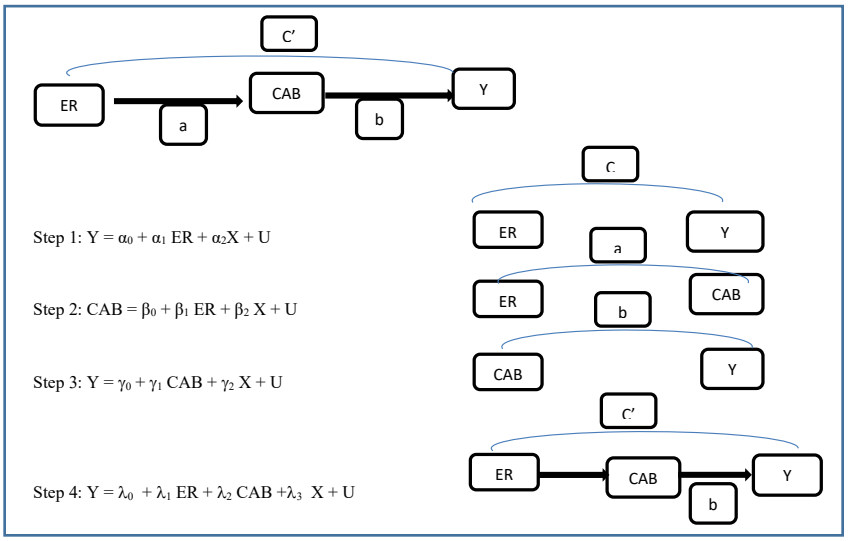
of the economy. The main reason behind the direct influence of devaluation on economic progression is that output is a function of aggregated demand, which is affected by devaluation through an increase in net exports. Hence, devaluation has an expansionary impact on economic growth through its expenditure switching policy (Taye, 1999). The well-known Marshall-Lerner condition demonstrates that currency devaluation can, over the course of time, improve both the trade balance and GDP. These positive effects of drop in the value of currency on growth in the economy are made clear by the fact that the condition indicates that devaluation of currency can have these effects. However, according to Krugman & Taylor (1978), devaluation negatively affects economic growth because the propensity to save that enterprises and capital owners have is larger than the propensity to save that wage employees have. Therefore, in examining the effects of devaluing on economic expansion from a theoretical standpoint, both the positive and negative aspects of devaluation are documented. This is because both are considered to be effects of devaluation.

The report's theoretical foundations are in the famous work done by Edwards (1986) who create an important model connecting the total output to the currency rate in order to investigate the influence that stabilizing initiatives have on the whole output in the emerging world.

Methodology

Econometric Model

Following Baron and Kenny (1986), this study employs a four step methodology by regressing different equations and checks their coefficients for significance. The following chart shows the direct and indirect impact of devaluation of domestic currency on economic growth through different channels, where c' represents the direct effect. Moreover, devaluation of domestic currency on economic growth through different channels are presented by a and b.



From step 1 to step 3, the significance of variables is checked. If the variables are insignificant then the mediation is not inferred. However, if the core variables are significant from step 1 to step 3, then the equation of step 4 is estimated for possible full or partial mediation is regressed. If the coefficient b significant after controlling for variable exchange rate, if this is the case, there should be some kind of mediation. However, if the currency exchange rate coefficient is not substantial after adjusting for the variable that is mediating the relationship, then the results demonstrate full mediation. If, after

accounting for the mediating variable, the coefficient of exchange rate is found to be substantial, then the data provide supporting evidence of partial mediation.

Calculating the Indirect Effect

In order to calculating the indirect impact and determining whether or not it is significant, the difference between the coefficients obtained from step 1 and step 4. The following formula is used to obtain the indirect effect:

$$B_{Indirect} = \alpha_1 - \lambda_1$$

The gap among both coefficients from steps 1 and 4 constitutes indirect effect.

Analytical Technique

In order to determine if there is a need for a mediator in the connection amid devaluation of currency and economic growth, this study uses time series econometric technique. However, before using the econometric technique for examining the mediating role of financial gap, in the connection amongst devaluation of currency and economic growth, the stationary of the variables are checked via Augmented Ducky Fuller (ADF) and Phillips-Perron (PP) unit root tests. This investigation utilized Autoregressive Distributed Lag model (ARDL) to acquire the appropriate long term coefficients and to evaluate the connection over the long-term. ARDL provides better results if there is a problem of endoginity (Pesaran et al 2001, Pesaran and Smith, 1998). Because the majority of variables in time series are stationary at first difference, the Autoregressive Distributive Lag (ARDL) was chosen for the purpose of analyzing the relationship that exists between the three core variables—devaluation of currency, economic growth, and current account deficit—in this particular study. If the variables have a non-monotonic order of integration, the ARDL method can be used. Following Baron and Kenny (1986), this study employs a four step methodology by regressing different equations and checks their coefficients for significance.

Empirical Outcomes

Unit Root Test Findings

Before moving to apply long run econometric techniques, the basic question is if or not the variables that lie under the surface have the unit root. So that to provide an answer to this query, the research makes use of the ADF, PP, and NP unit root tests. Table 4.1: Unit Root test findings.

Table 1.

Variables	ADF		PP	
	Level	1st diff:	Level	1st diff:
Y	-5.039**	-11.745*	-5.181**	-18.486*
ER	0.871	-4.092**	2.002	-4.027**
CAB	-2.096***	-6.583*	-2.906***	-6.484*
REM	-1.599	-5.572*	-1.824	-5.603
INF	-3.310**	-7.988*	-3.482**	-7.988*

, ** and * represents significance level at 1%, 5% and 10%.*

The results presented in table 4.1 clearly demonstrate that there are certain variables that are integrated at order zero, and there are some variables that are integrated at order one. The variables Y, ER, and REM are all considered to be stationary at first difference, whereas CAAB and INF are both considered to be level stationary.

Lag Selection of ARDL

To get an accurate depiction of the variables' behaviour in the long term, it is necessary to use the ARDL econometric technique. This was determined by the findings of the unit root tests. The application of ARDL takes place in three stages. First, an estimate of the connection over the long term is made. The lag

length of the error correction version model can be determined for this purpose using the Schwartz Bayesian Criteria (SBC). The estimation of the association over the long term is done with statistics using the F-test, and the Wald test serves as the basis. The findings are summarized as follows in table 4.3:able 4.3: Long-term Relationship Estimate

Table 2. Modal 1 (Growth Equation)

Order Of the Lags	AIC	SBC	F-test Statistics
K = 1	105.2991*	105.7522*	2.12
K= 2	105.4884	106.3191	5.76**
Short run Diagnostic Tests			
LM test (Serial Correlation) = 0.05 (0.95)			
Hetroscedasticity Test (White): 0.91 (0.54)			
Model Specification Test (Ramsey RESET) = 0.0006 (0.98)			
Normailty Test (Jarque-Bera)= 0.92 (0.62)			

, ** and * represents significance level at 1%, 5% and 10% as per Pesaran et al (2001) and Narayan P (2005) critical values.*

The substantial F-statistics result at the optimum lag length of 2 suggests that there has been a long term association among many of the variables of the growth equation at the threshold of significance of five percent. This research also makes use of the CUSUM and CUSUM square tests in order to estimate the long-term link that exists between the variables in the growth equation.

The ARDL method is then used to evaluate the long run coefficients when it has been established that a stable long-term relationship does in fact exist. Table 4.6 provides a presentation of the findings.

Current Account Balance Channel

Step 1: $Y = \alpha_0 + \alpha_1 ER + \alpha_2 X + U$

Table 3. Long-term Coefficients Findings Dependent Variable: Real GDP growth rate (Y)

Regressors	*Coefficients*
ER	-0.18***
GS	0.26**
GFCF	0.001***
CON	0.002**
	$R^2 = 0.99$
	Adjusted $R^2 = 0.99$
	F-statistics =6.584*
	Dh Stat = 2.21
	ARDL Order (1, 0, 1, 2, 1)

, ** and * reflects the extent of significance at 1%, 5%, and 10%.*

The results of table 4.4 demonstrate that economic growth depends on exchange rate, gross savings, investment (measured by GFCF) and consumption. The explanatory variables are significant. The significant F-statistics indicates that the overall model is best. It may be deduced from the negative and statistically significant (at the 10% level) exchange rate coefficient that devalues of currency hinders Pakistan's economy from growing. This is indicated by the fact that the coefficient is negative. The findings suggest that total

monetary savings have a beneficial effect on economic expansion. According to the coefficient of private investment, which is measured by gross fixed capital creation, high levels of investment cause a faster rate of economic growth. The significant coefficient of consumption indicates that an increase in consumption increase domestic demand and hence accelerate economic growth.

Step 2: $CAB = \beta_0 + \beta_1 ER + \beta_2 X + U$

Table 4. Results of Coefficients in the Long Run Dependent Variable: Current Account Balance (CAB)

Regressors	*Coefficients*
ER	-0.12**
GFCF	0.03
CON	-0.001**
	$R^2 = 0.97$
	Adjusted $R^2 = 0.96$
	F-statistics =11.03 (0.000)
	Dh Stat = 2.11
	Order (1, 0, 3, 2)

*** and**** represent Significant at 5% and 10% level.*

The results of table 4.5 shows that exchange rate negatively affect current account balance. A one unit increase in exchange rate leads to 0.12 unit increase in current account balance. Further, gross fixed capital formation positively and significantly affects current account balance. The variable consumption negatively affects current account balance. The overall F-statistics is significant, which demonstrates the overall goodness of fit of the model under consideration.

Step 3: $Y = \gamma_0 + \gamma_1 CAB + \gamma_2 X + U$

Table 5. Long Run Coefficient Results

Dependent Variable: Real GDP growth rate (Y)

Regressors	*Coefficients*
CAB	0.28***
INF	0.03
MVA	0.05**
FDI	-0.003
	$R^2 = 0.97$
	Adjusted $R^2 = 0.96$
	F-statistics =2.84 (0.01)
	Dh Stat = 2.18
	ARDL Order (1, 0, 2, 3, 2)

*Note: ** and*** means Significant at 5% and 10% level.*

In step 3, economic growth is regressed on current account balance and other control variables. Based on the findings in table 4.6, we may conclude that current account balance (CAB) positively affects economic growth. A one unit increase in current account balance leads to 0.28 unit increase in economic growth. Inflation rate negatively affects

economic growth after controlling for current account balance and other variables. This is due to the fact that inflation increases the cost of production and hence alters economic growth. Further, manufacturing value added affects economic expansion in a constructive way. The variable FDI positively affects economic progress. The overall F-statistics is significant, which demonstrates the overall goodness of fit of the model under consideration.

Step 4: $Y = \lambda_0 + \lambda_1 ER + \lambda_2 CAB + \lambda_3 X + U$

Table 6. Results of Long Run Coefficient Dependent Variable: Real GDP growth rate (Y)

Regressors	*Coefficients*
ER	-0.29*
CAB	0.24***
GFCF	0.04*
	$R^2 = 0.98$
	Adjusted $R^2 = 0.97$
	F-statistics =5.22 (0.000)
	Dh Stat = 2.23
	ARDL Order (1, 0, 2, 3, 2)

** and*** represent Significant at 1% and 10% level.*

In step 4, economic growth is regressed on exchange rate, current account balance (CAB) and alternative control variables to analyse the full mediation or partial mediation. The results of table 4 show that exchange rate negatively affects economic growth after controlling for inflation and other variables. Current account balances (CAB) positively affect economic growth. Further, gross fixed capital formation positively and significantly affects economic growth. The overall F-statistics is significant, which suggests that the model being considered has a strong overall fit is what is being considered.

The mediating effect can be calculated by subtracting these two coefficients from step 1 and Step 4:

$B_{Indirect} = \alpha_1 - \lambda_1$

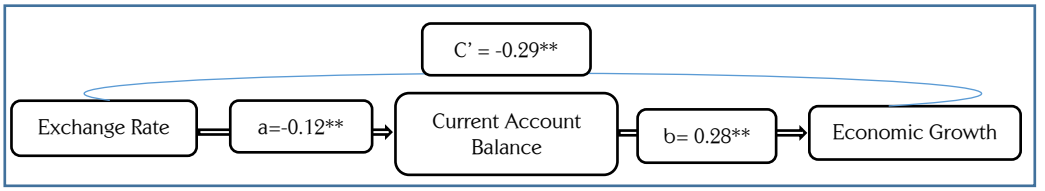
$B_{Indirect} = -0.18 - (-0.29) = 0.11$

Table 7. Summery of Mediation Channels and Coefficients

Hypotheses	Model Variables		Estimates	P	Results
H1	DEV → EG	c'	-0.18		Supported
H2	DEV → CAB	a	0.12	0.05	Supported
H3	CAB → EG	b	-0.28	0.08	Supported
H4	DEV → CAB → EG	$B_{Indirect} = \alpha_1 - \lambda_1$	0.11	---	Full Mediation Supported

, ** and * means Significant at 1%, 5% and 10% level.*

Summary of the Results



Conclusion: Full Mediation Supported

Conclusion

This research is based on the mediating role of current account deficit in the connection between

the weakening of the currency and the expansion of economy over the period 1972-2016. In order to check the mediating role in the connection between the weakening of the currency and the expansion of the economy, this study uses time series econometric technique. The variables' stationarity is tested using the Augmented Ducky Fuller (ADF) and Phillips-Perron (PP) unit root tests. The conclusions generated from the unit root tests indicate that the variables are mixed in ordering of integration. This study uses sensitivity analysis and chooses among different econometric technique, which takes into account the endogenuity problem. Since the ARDL Model was chosen, due to the fact that the vast majority of time series variables are stationary at initial difference. For the purpose to investigate the connection that exists between the variables, such as devaluation of currency, current account deficit, and economic growth, This study adopts the four step approach of Baron and Kenny (1986) by regressing four equations for one mediating channel and check the significance of variables at each step. The results clearly demonstrate that current account balance fully mediate the connection between devaluation of currency and economic growth. The findings of the investigation point to the fact that devaluation of currency negatively affects current account balance and alter economic growth. Moreover, through indirect channel, devaluation of currency negatively affects current account balance, which hampers economic growth. The basic reason is that Pakistan faces the problem of foreign trade deficit, the policy of devaluation to correct foreign trade deficit. Devaluation inversely affects aggregate demand because the country faces primarily trade deficit. With devaluation, the country imports go above exports, price of traded goods tends to be high which results a rise in the earnings of foreigners and a decline in the revenue of the host nation. the greater is the initial trade deficit face by the country, the more is the negative effect of devaluation. The findings of this study are parallel with the findings of Lesliroz (2008), Kokoh terzungwe, & Shiferaw solomon (2007) who are of the opinion that in the developing countries the imports and exports elasticity's are very low down, so devaluation may not be much favorable in such countries.

Policy Recommendations

This study recommends that

- Pakistan should focus on export promotion policy and should produce and export elastic commodities.
- Moreover, concentration should be given to produce high quality export commodities.
- Export sector should be provided with tax exemption so that to compete the foreign markets.
- A policy should be formulated to stabilize the domestic currency and unprecedented hikes should be controlled.

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Appendix
Results of CUSUM and CUSUMsq

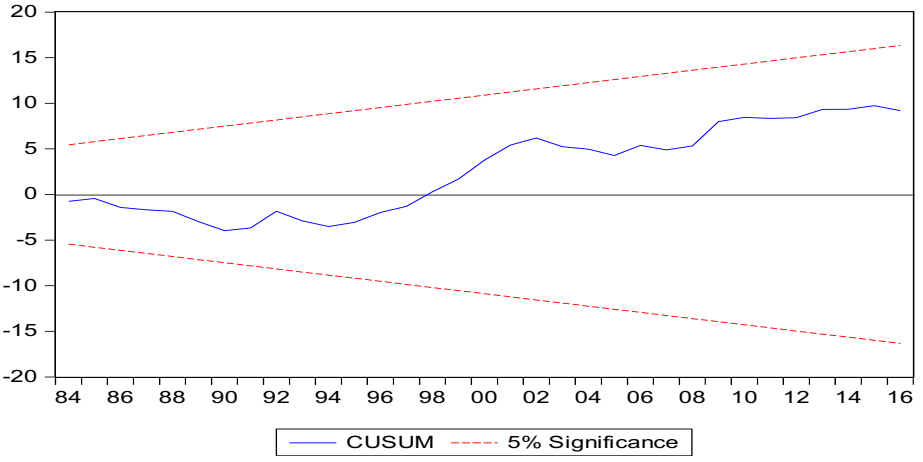

Figure 1: Cumulative Sum Plot of Recursive Residuals of Private Growth Equation

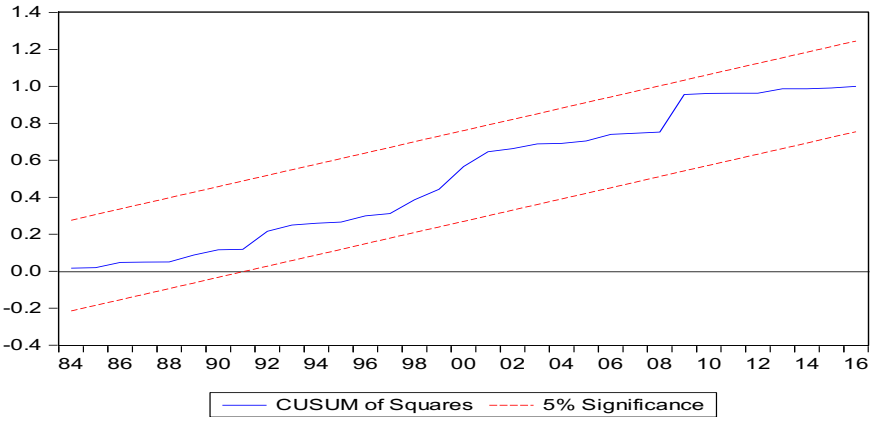

Figure 2: Plot of CUSUM Squares of Recursive Residuals of Growth Equation