

Macroeconomic Determinants of National Savings Revisited: A Small Open Economy of Pakistan

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Abstract: This paper explains the determinants of national savings in the process of economic growth, in the glimpse of Pakistani experience. Using Autoregressive Distributed Lag Model (ARDL) bound testing approach for co-integration techniques to check the robustness for long run relationship and Error Correction Mechanism (ECM) for short run dynamics during the 1974-2010. It is found that the per capita income inversely related with national saving rate, both in long run and as well in short run significantly. The exchange rate and inflation rate have a negative impact on national saving but lagged exchange rate has significantly impact. Because of floating exchange rates and the decrease in capital controls, the volume of international capital flows in a country, has increased significantly. Trade openness is positive associated with national savings in Pakistan because trade openness cause to increase the income and welfare of the society in through market economy. Money supply positive linked with national saving due to seigniorage effect. The growth of the income level has negatively related with national savings. Keynesian and permanent income hypothesis of income and savings is not valid for Pakistan because per capita income and income growth invers function of savings at national level.

JEL Classification: E2 • C12 • C13

Key words: National Savings • Co-integration • ARDL

INTRODUCTION

National savings in macroeconomic theory is defined as it is the merger of public savings and private savings of a nation. Previous ideas regarding savings, it plays a very important role for economic development. Currently, Pakistan is facing the problem of macroeconomics instability. This paper empirically investigates the Keynesian and permanent income hypothesis of income and savings functions with other some control macroeconomic variables at national level. For this, use some macroeconomic variables of national savings in case of small open economy of Pakistan. Pakistan is a good case study due to two reasons. First, foreign sector inflow have been a key power for the investment process because of more openness or liberalization of financial sector, trade and technologies. Second, in the early 1970s saving rates have knowledgeable fluctuated and lay down

afterward. There is a broad consensus that low national saving rate is one of the most serious impediments to achieving higher and more sustainable economic growth. That is why classical and neo classical models are more seem to empathize on higher savings for long run growth. The neoclassical model analyses that the evolution between steady states, positive change in saving ratio may promote growth rate (Solow [1]). After that endogenous growth model that is introduced by Romer [2] and Lucas [3] they mentioned that economic growth depend on savings, technological change and human capital.

Small open economies have limited international capital integration and higher domestic saving may cause to higher investment for economic growth under the assumption of investment and domestic savings are highly correlated to each other. In literature the relationship between saving and growth has a main topic

of debate in the process of long run stable economic growth. Subsistence-consumption theories propose that countries with high income levels be likely to have a greater saving rate and the observed confirmation powerfully chains this close (Dayal-Ghulati and Thimann, [4] Loayza *et al.* [5]). According to the permanent income hypothesis and Keynesian approach, it is hypothesized that the private as well as national savings are positively associated to the GDP growth and national income because more excess in income means a higher saving rate in the economy. Therefore, per capita income and GDP growth rate variable in the saving function. Deaton [6] have also provided evidence that higher income growth may produce higher saving. He also examines the impact of inflation, inflation reduces the real income or purchasing power of the society secondly it may create the uncertainty in future income.

Ozean *et al.* [7] investigate the relationship between income and saving for Turkey. Results of the time series data explain that income positively related with savings. The life cycle theory also defines the positive relation between per capita income and savings¹. They also conclude that the real per capita income has positive impact on saving, which supports the hypothesis that there is a virtuous circle that goes from faster growth. The most significant result of this study is that public savings has a harmful impact on the saving rate that is why public saving will tend to crowd out private savings. Edward [8] study why savings rate in Latin America nations have very low as likened them with some of the most effective countries in the world. He also establish that per capita income growth appeared to be the most key determinants of aggregate savings, public saving are lesser in countries with sophisticated political instability, public savings crowd out private saving but less than proportionality.

Pesaran and Smith [11] analyses the long run association between government financial and national saving, results shows that in the long run surge the public side financial sector surplus due to increase in GDP and national savings. Public policy has been the prime way for try to stimulus national savings. This is grounded on the idea that “an improved fiscal balance could reliably and directly contribute to national saving, whereas policies to endorse private saving would be uncertain in their effect” (Edey and Gower, [12]). Fiscal policy plays a key rule to increase the national saving with sound fiscal policy. The empirical result shows that the Ricardian equivalence

is valid in the framework for developing nations. The most collective result is that rise in public savings may reduce private savings but less than proportionally.

Narayan and Seema [13] used Autoregressive Distributed Lag Model (ARDL) cointegration approach is used to see the links of macroeconomic variables with national savings a time series case study for Fiji. Results supports Keynesians saving function, income or output has a positive influence on savings rate. Further they suggesting that savings rate will stream with a rise in output or growth of output. Edwards [14] investigate the aggregative saving behavior for cross countries, empirical results indicate that income, income growth, population growth, terms of trade, interest rate, inflation and asset price growth does influence national saving rate. Paresch and Siyabi [15] explore the connection between national savings of Oman's and its some macroeconomic determinants; they used Autoregressive Distributed Lag Model (ARDL) model to estimate the long run effect of variables. The results show that current account, urban population rate and money supply significantly influence on Oman's national savings. Agenor and Aizenman [16] analyses that the terms of trade have a significantly positive effect on savings for developed countries but not in case of developing countries due to depression of exchange rate. The floating exchange rates may cause less control on foreign capital flows, the capacity of international capital movement, among established nations, has enlarged significantly. Obstfeld and Taylor [17] If capital flows is freer to across borders, a rise in domestic saving is more likely to influence the balance of trade and improve the net exports due to the high investment at domestic level.

Looney [18] investigates the savings behavior for Pakistan he concludes that the government of Pakistan has depended on classical methods to improve savings. Government tries to improve saving rate of the private sector with the array of national saving schemes through financial institutions. Saving schemes and saving benefits have not produced sufficient results. The second method is to improve the savings rate through public policy and national income. Gross National Savings involves on worker remittances are have not work successfully to improve the savings and income levels. Public policy always depends on high indirect taxes and deficit financing this create the instability in persisting increase in saving rate. The previous studies reveals that financial liberalization a major sources to increase the income level

¹ Modigliani [9] and [10].

as well as savings rate in developing nations but Pakistan is not able to increase in savings from financial liberalization.

Earlier studies on the detriments of national savings for Pakistan to analyse the investment and private saving behavior. The some studies on saving and investment in the shed of foreign investment the results shows that the foreign investment has positive impact to enhance the economic growth. For Pakistan, mostly studied use determinants of national saving rate in terms of different macroeconomic variables of reasons that contains like income, real interest rate, money supply and foreign aid or capital inflow (Khan and Malik [19], [20]). This study also uses the macroeconomic variables with the effect of trade openness behavior.

Theoretical Framework: National saving is a combination of private and national savings rates. There are two methods to calculate national saving or net national saving. Gross national savings is a total amount of a nation income minus its aggregate consumption and also illustrates the available funds for local or overseas investment. There is some share of gross national saving earnings for substituting capital goods that have been mines out that are used in the production goods and services, The consumption of gross fixed capital in mechanical terms, or depreciation on capital. The other share of gross national saving is employ to sum of the nation's stock of capital or capital goods that is equal to net national savings. The most commonly measure to calculate the net national savings is whether the nation's volume of production of goods and services in the future is increasing or decreasing.

The starting point, we use national income accounting methods for national saving (in current prices): normally, the savings of any country is constructed on the current income level minus its expenditure on current level. From macroeconomics angle, there has three significant measures of saving one is national saving second is government saving and third is private saving. Now we see the accounting equation of private saving that is equals to private disposable income minus consumption

$$S_{pvt} = (y + NFP - T + TR + INT) - C \quad (1)$$

where:

S_{pvt} private saving is the total level of the economy which is getting from the private disposable income minus consumption. In eq (1) $Y + NFP - T + INT$ is equal to the proportion of private disposable income². If we find out the public saving for the open economy that is normally defines as net government income see the eq (2) as below, less government purchases of goods and services also key variable which is determined the public saving.

$$S_{govt} = (T - TR - INT) - G \quad (2)$$

Perhaps more familiar, name for government saving is the government budget surplus means government income is greater than the public consumption or purchases. The government budget surplus equals government receipts minus government's outlays. Government's receipts equal all types of tax revenue; outlays are the sum of government expenditures of goods and services, so we write the eq- 2 in the following form as below

$$S_{govt} = T - (TR + INT) \quad (3)$$

For the open economy national saving is the combination of both type of saving of the economy as a whole, like equals to private plus government savings. So we drive the national saving NS final equation as below,

$$\begin{aligned} NS &= S_{pvt} + S_{govt} \\ &= (Y + NFP - T + TR + INT - C) + (Y - TR - INT - G) \\ &= Y + NFP - C - G \end{aligned} \quad (4)$$

The object of this study to examine the macroeconomic variables in the frame of open market condition to explain the short and long runs interactions among national savings, exchange rate, income, tariff rate and rate of urban population in Pakistan using ARDL cointegration for long run and Error Correction Mechanism (ECM) for the short run dynamic over the period 1974-2010. The above sections B explain the model and data collection, methodology and in the end interpret the empirical results.

Model and Data Collection: Based on the above discussion, the national saving model for the ensuing empirical analysis can be specified as,

² Here Y = gross domestic product (GDP), NFP = net factor payment, TR = transfers payment from abroad, INT = interest payments on the government's debt and T = taxes.

Table 1: Correlation Matrix and Statistical Descriptive

	LNS _t	LATR _t	LEXC _t	LUPOP _t	LPCI _t	LCPI _t	LM _{2t}	LGDPG _t
Mean	11.945	2.992	3.291	17.363	10.040	3.650	26.869	1.611
Median	11.997	3.205	3.279	17.401	10.096	3.631	26.839	1.740
Maximum	14.333	3.586	4.445	17.949	10.429	5.067	29.302	2.197
Minimum	8.729	2.020	2.293	16.665	9.623	2.195	24.163	0.531
Std. Dev.	1.579	0.468	0.736	0.387	0.237	0.812	1.500	0.413
Skewness	-0.221	-0.716	-0.031	-0.216	-0.230	-0.042	-0.063	-0.851
Kurtosis	2.148	2.002	1.556	1.841	2.091	1.800	1.868	3.119
Jarque-Bera	1.383	4.569	3.134	2.296	1.558	2.169	1.946	4.363
Sum Sq. Dev.	87.270	7.660	18.971	5.245	1.962	23.074	78.776	5.969
Observations	36	36	36	36	36	36	36	36
LNS	1.000							
LATR	-0.767	1.000						
LEXC	0.969	-0.805	1.000					
LUPOP	0.992	-0.757	0.987	1.000				
LPCI	0.980	-0.697	0.965	0.989	1.000			
LCPI	0.987	-0.789	0.990	0.995	0.980	1.000		
LM ₂	0.993	-0.784	0.985	0.997	0.986	0.997	1.000	
LGDPG	-0.078	0.130	-0.176	-0.111	-0.035	-0.128	-0.096	1.000

$$NS_t = f(ATR_t, EXC_t, UPOP_t, PCI_t, CPI_t, M_{2t}, GDPG_t) \quad (5)$$

$$LNS_t = \alpha_0 + \alpha_1 LATR_t + \alpha_2 LEXC_t + \alpha_3 LUPOP_t + \alpha_4 LPCI_t + \alpha_5 LCPI_t + \alpha_6 LM_{2t} + \alpha_7 LGDPG_t + \varepsilon_t$$

$$t = 1, 2, \dots, n \quad (6)$$

where, NS_t for the open economy national saving or the saving of the economy as a whole, equal private plus public savings. ATR_t average tariff rate used as a proxy for trade openness more tariff rate means less open market condition. Exchange rate (EXC_t) of Pakistan is the price of dollar against pak Rs. UPOP_t Urban population rate, PCI_t per capita income and Inflation is include by computation of Consumer Price Index (CPI_t). In Pakistan, basket of CPI comprises of 375 items in 35 major cities. M_{2t} is a broad money or quasi money and GDPG_t GDP growth rate of the economy. ε_t is used for the error term, assume as a white noise in the above model.

Data of all certain variables has been taken from World Development Indicators (WDI-2012), International Financial Statistics (IFS-2012) and Economic Survey of Pakistan (various issues). While, pair-wise correlations are given in Table 1. Tariff rate and growth rate of national income are negatively correlated with national saving rate while other variable are positively correlated with Pakistan’s savings.

Methodological Framework: The empirical validation of economic theory has gained more importance in relevant economic literature. Various econometric approaches are used to test relationship between the variables of

economic theory. The empirical estimation of economic theory is meaningless without testing unit root problem of the variables. To examine stationary behavior of the series ADF (Dickey and Fuller [21] The Augmented Dickey Fuller (ADF) [22] tests are useful to study the unit roots in the variables. To examine the unit root problem, equation is being modeled as given below:

$$\Delta Y_t = \beta_1 + \beta_2 T + \delta Y_{t-1} + \alpha_i \sum_{t=1}^m \Delta Y_{t-1} + \varepsilon_t \quad (6)$$

where ε_t is a normally white noise distributed according to standard assumption of error term and the differences of the relevant variables?

$$\Delta Y_t = (Y_t - Y_{t-1}), \Delta Y_{t-1} = (Y_{t-1} - Y_{t-2}), \Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$$

This test looks to control whether estimate of δ is equal to zero or not. ADF statistics to take decision about unit root problem. The variable Y_t is to be stationary if the tabulated value of Y_t is greater than estimated value of τ (Dickey and Fuller, [21]).

Autoregressive Distributed Lag Model (ARDL) to Co-Integration: We apply ARDL bounds testing approach for cointegration to examine the long run bond among related variables. This approach is introduced by Pesaran *et al.* [23]. The ARDL bounds testing method for cointegration is more appropriate than other classical methods. For example, the ARDL bounds testing is more applicable to analyses the cointegration if cornice variables are integrated with changed order of

integration such as I(0) or I(1) or mix order of integration. This suggests that unit root testing is not necessary for ARDL bounds testing. It is pointed out by Ouattara [24] that ARDL bounds testing approach assumes, variables should be integrated at I(0) or I(1), if any variable is stationary at I(2) integrating order then F-statistics developed by Pesaran *et al.* [23] becomes useless. The ARDL bounds testing approach to cointegration presents better and reliable results for small samples. A simple linear transformation is used to derive dynamic Error Correction Mechanism (ECM) (Banerjee *et al.* [25]). The ARDL bounds testing approach combines long and short run without losing information regarding long run relationship.

The unrestricted error correction model (UECM) of the ARDL version is modeled as following:

$$\Delta y_t = \lambda_1 + \lambda_2 y_{t-1} + \lambda_3 z_{t-1} + \lambda_4 x_{t-1} + \sum_{i=1}^p \gamma_i \Delta y_{t-i} + \sum_{j=0}^q \alpha_j \Delta x_{t-j} + \sum_{s=0}^r w_s \Delta z_{t-s} + \varepsilon_t \quad (7)$$

where λ_1 is considered as constant and ε_t is residual term supposed to be normally distributed. The ARDL bounds testing approach to cointegration calculates number of regressions following $(p + 1)^k$ formula which helps in choosing appropriate lag order. The optimal lag order clears the model from serial correlation problem and provides appropriate F-statistics to take decision about the existence of cointegration between the series. Where “ $p(k)$ ” is the total number of lags (variables) to be used in the equation 7. To test the existence of cointegration, Pesaran *et al.* (2001) generated two critical bounds i.e. upper critical bound (UCB) and lower critical bound (LCB). F-test was developed by Pesaran *et al.* [23] to analyze the joint significance of the parameters in equation-7. The significance of null hypothesis $H_0 : \lambda_2 = \lambda_3 = \lambda_4 = 0$ shows no cointegration between the series while cointegration exists if alternative hypothesis $H_1 : \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0$ is found to be significant. The hypothesis of cointegration between the variables is accepted if calculated F-calculated value more than upper critical (UCB) which suggests that long run relationship exists among variables³. We may accept null hypothesis indicating no cointegration if F-statistic does not cross lower critical bound (LCB). The conclusion will be inconclusive if F-statistic lies between LCB and UCB.

Once long run relationship between the series is found then next step is to estimate short run behavior of forcing variables on dependent variable by using error correction model (ECM). The estimable equation of error correction model is modeled as following:

$$\Delta y_t = \sum_{i=1}^p \lambda_i \Delta y_{t-i} + \sum_{j=0}^m \beta_j \Delta x_{t-j} + \sum_{k=0}^n \beta_k \Delta z_{t-k} + \eta ECT_{t-1} + \varepsilon_t \quad (8)$$

where *ECT* is error correction term indicating speed of adjustment from short run disequilibrium towards long run? The stability and diagnostic tests are carried out to test the goodness of fit of autoregressive distributive lag model (ARDL). In diagnostic test, we apply to find out serial correlation between error terms, specification problem, normality of residual term and white heteroscedasticity are concern with short run model. The cumulative sum of recursive residuals (CUSUM) is applied to test the constancy of ARDL parameters. This is another way to find out prediction error which indicates the reliability of the ARDL model. The model presents the best fit if difference between real and estimated value is minimal.

Empirical Results: Prior to regress ARDL for association among the related variables we examine whether all the series are stationary or not. This study examines the integrating order of all the variables by applying unit-root test (ADF), i.e. Dickey and Fuller [22] unit root test. Therefore, the operation of unit root test to smear the ARDL technique might still be essential in order to confirm that none of the variable is integrated of order *I*(2) or beyond. Table-2 shows the order of integration of all the variables in the model that are stationary at 1st difference at 5% level of significant except LGDPG_t and LUPOP_t are stationary at level.

The ARDL approach for cointegration is start to the selection of lag order through VAR. The optimal lag order is 1 carefully chosen on the foundation of minimum value of Akaike Information Criteria (AIC). The calculated value for lag length selection criteria are given in above in Table-3.

Turning to ARDL results shown in Table-3, the total amount of lags probable following the ARDL approach in the equation-7 is $(1+1)^8 = 256$. Based on AIC, the equation-7 with lag order (0,1,0,0,1,0,1) is selected. The results of the (ARDL) for Co-integration show that the estimated F-statistics is 7.724⁴, which is higher than

³ If all the series are integrated at I(1) then decision regarding cointegration depends upon the upper critical bound (UCB) and vice versa.

⁴ As can be seen from Table 3, although the results of the *F-test* changes significantly at lag order 1.

Table 2: Unit-Root Estimation

Variables	ADF Test at Level			ADF at 1 st Difference		
	Calculated value	Inst. Values	Lags	Calculated value	Inst. Values*	Lags
LNS _t	-2.521118	0.1193	1	-7.656435	0.0000	0
LATR _t	-0.401515	0.8984	0	-5.575123	0.0000	0
LEX _t	0.455709	0.9826	0	-4.157267	0.0026	0
LUPOP _t	-3.135829	0.0335	3	-3.672259	0.0411	1
LPCI _t	-0.672259	0.8411	0	-4.735521	0.0005	0
LCPI _t	0.289028	0.9739	5	-4.109915	0.0029	0
LM _{2t}	-1.729362	0.4084	0	-4.350040	0.0015	0
LGDPG _t	-4.618735	0.0007	0	-6.699655	0.0000	2

Lag Length Selection of VAR Model			
Lags	AIC	SBC	Maximum Likelihood
0	-11.25352	-10.89801	204.9366
1	3.50e-23*	-29.099*	581.2324

Note: * indicates lag order selected by the criterion

Table 3: F-statistic of Co-integration Relationship

Test-statistic	Calculated-Value	Lag-order	Significance level	Bound Critical Values	
				I(0)	I(1)
F-statistic	4.075	0	1%	5.25	6.36
	7.724*	1	5%	3.79	4.85
			10%	3.17	4.14

*ARDL F-Statistic calculated value indicates that there is robust sign of long run relationship among said variables.

Table 4: Long Run Elasticity's, (0,1,0,0,1,0,1)

Variable	Dependent Variable: DLNS		
	Coefficient	T-values	Inst. values
Constant	-68.660	-5.1647	0.0000
LATR	-0.3933	-1.7562	0.0900
LEX(-1)	-1.4121	-3.9228	0.0005
LUPOP	0.7142	1.9964	0.0312
LPCI	-0.5787	-0.4133	0.6825
LCPI(-1)	0.2538	0.6758	0.5047
LM2	0.3563	1.0321	0.3108
LGDPG(-1)	-0.1178	-1.2806	0.2108
R-squared = 0.9935		Adj-R-squared = 0.9919	
Durbin-Watson = 1.7176		F-statistic 617.273	
AIC = -0.9436		SBC = -0.5803	

the upper level of critical value at the 1 percent level of significance as Pesaran *et al* [22]. The null hypothesis of no Co-integration cannot be accepted and that there is existence a Co-integration among the variables in this model.

The outcomes of ARDL coefficient is informed in Table 4 the value of coefficient shows the presence of long run association among the variables. This indicates that tariff rate, exchange rate, urban population rate, per capita income, consumer price index, money supply and growth rate of GDP are cointegrated in the long run.

Table-4 shows long run elasticity's of the variables. The elasticity of coefficient explains that there is inverse association between tariff rate and national savings. A 1 percent positive change accord in tariff rate causes 0.393 percent to decrease in national savings. Average tariff rate is certainly associated with national savings in Pakistan because trade openness cause to increase the income of the market player. Exchange rate and GDP growth rate also inversely related with national savings due to depreciation in local currency and unstable of economic growth.

Table 5: Short Run Dynamics (0, 1, 0, 0, 1, 0, 1, 1)

Variable	Dependent Variable: DLNS		
	Coefficient	T-values	Inst. values
Constant	-0.1257	-0.8081	0.4264
DLATR	0.0062	0.0331	0.9738
DLEXC(-1)	-0.4583	-0.9467	0.3525
DLUPOP	4.5511	1.2257	0.2313
DLPCI	-1.3497	-0.9514	0.3502
DLCPPI(-1)	-0.0100	-0.0130	0.9897
DLM2	1.2803	2.6031	0.0151
DLGDPG(-1)	-0.0901	-1.9512	0.0619
ECM(-1)	-0.8032	-3.8705	0.0007
R-squared = 0.6330		Adj-R-squared = 0.5200	
Durbin-Watson = 1.4873		F-statistic = 5.658	
AIC = -1.113		SBC = -0.6103	

Money supply and lagged value of inflation positively link with national saving because Government of Pakistan used loss monetary policy for fiscal need. On average 1 percent change accrue inflation hints to 0.253 percent positive change in national savings. The relationship between urban population rate and national savings are linked positively and significant at 5 percent level of significant. 1 percent positive change in urban population rete causes 0.719 percent increase in national savings. The Keynesian approach and the permanent income hypothesis it is hypothesized that the savings rate is surely linked with growth in the national income because more surplus income means a higher savings rate in the economy. The GDP growth rate and per capita income are used alternatively as income variables in all the savings functions. In case of Pakistan GDP growth and per capita income are negatively related, both hypothesis are not valid in Pakistan.

When we examine long run co-integration of variables, then we are able to estimate the short run analysis for the independent variables with respect to tax revenue. Table 5 is clarifying the short run results of the model. The coefficient of ECM_{t-1} explains adjustment speed to long run equilibrium. The sign of ECM_{t-1} must be negative and significant, Bannerjee *et al.* [26] proof that significant ECM_{t-1} is further explanation of long run relationship among the said variables. It is the more reliable way to examine the co-integration among variables. The coefficient of ECM_{t-1} is - 0.803 which is significant at 5 percent of significant level.

Table 5 provides short run results of the study. The outcome of the study indicates that there is an inverse correlation among per capita income and GDP growth with national savings. The Keynesian approach and the permanent income hypothesis it is hypothesized

that the savings rate is positively related to the growth in the national income because more surplus income means a higher savings rate in the economy. In case of Pakistan GDP growth and per capita income are negatively related, both hypothesis are not valid in Pakistan for the short run.

Conclusion and Policy Implications: The purpose of this paper is to examine the determinants of Pakistan's national savings rate. We utilized ARDL bound testing approach to check the robustness for long run relationship and Error Correction Model (ECM) for short run dynamics during the 1974-2010. It is found that the per capita income inversely related with national saving rate, both in long run and as well in short span of time significantly. The exchange rate and inflation rate have a negative impact on national saving but lagged exchange rate has significantly impact. Because of floating exchange rates may cause to decrease in capital controls, the volume of international capital flows in a country, has increased significantly.

Average tariff rate is certainly associated with national savings in Pakistan because trade openness cause to increase the income of the market player. High inflation rate negatively affect the saving while money supply positive impact on national saving due to inflationary tax. The growth of the income level has negatively related with national savings. The finding implies that Keynesian approach and the permanent income hypothesis are not valid in Pakistan. For the policy purpose we should stabilized and improve the economic through more production. Trade openness is favorable for national savings if we control the monetary policy it may helpful for exchange rate hopelessness.

Appendix-A:

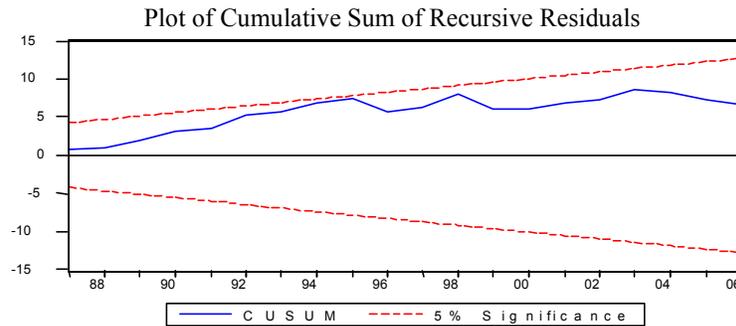


Fig. 1: The straight lines represent critical bounds at 5% significance level

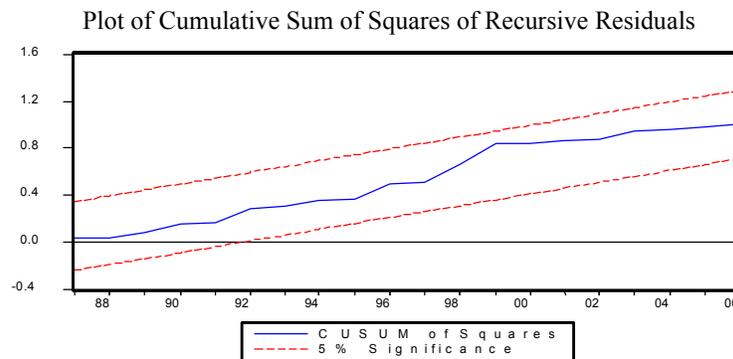


Fig. 2: The straight lines represent critical bounds at 5% significance level

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