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The Corruption Challenge for Accelerating National Savings in Pakistan: A Fiscal Policy Perspective

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Abstract

The paper focuses on the theory of national savings and role of socio-economic factors; predominantly "control of corruption" & "institutions" in affecting the savings rate in Pakistan. The paper employs ADRL model to empirically test the concern of rising corruption in developing country like Pakistan. The results suggest that gross domestic product, net exports, government expenditures, control of corruption, age dependency ratio and real interest rate share a long run relationship with national savings in Pakistan. On the same hand, the results from short-run parameters (ECM) suggest that all explanatory variables except control of corruption (current year) and age dependency ratio have significant impact on saving rate. Since, institutions are embodied in the social structure of a country and its process of ages to move to open access social order and thus, Control of corruption shows results in long run. Policies targeting strong institutions, with a focus on control of corruption (taken as socio-economic determinant of national savings) would breed efficiency and transparency in system which would lead to more employment opportunities.

Keywords: National Savings, Control of Corruption, Institutions, Government Financial Consumption Expenditures, ARDL, Pakistan.

Introduction

How national savings are continuously destroying the base of countries is a hot debate even in today's era. Middle and lower class are deeply hurt if saving are destroyed by bad government policies, thus, affecting the key determinant to growth for any nation. According to Roomer (1986), economic growth mainly depends upon technological changes, human capital and aggregate saving. If poor countries wish to amplify their growth rates, then it is essential for them to save and invest higher proportion of national income into economically and socially viable projects. Roy F. Harrod (1939) postulates that savings may act as a drag on economy (saving paradox). Contrarily, other literature suggests that country can only progress if it has deferred consumptions (Savings). Hence the essence of growth to Keynesian economists' lies in savings which are tomorrow's investment. Moreover, the new injected capital is indirectly dependent upon the national savings. United States of America, Japan and China are the major economies and also are top savers of the world. Economics giants mainly depend on high and persistent national savings rate for their economic development. The following table 1 shows the decade-wise comparisons of gross domestic saving of Pakistan with other countries.

The average savings rate of Pakistan in the decades of 70's and 80's was quite premature. In the 70's, average savings rate was 8.44 percent of Gross Domestic Product (GDP). In the 80's the savings rate improved marginally to 8.47 percent of GDP. According to Pakistan Economic Survey (2011-2012), the contribution of aggregate savings to domestic investment is indirectly the mirror image of foreign savings required to meet investment demand. The requirement of foreign savings

to finance the saving investment gap, reflects the current account deficit in the balance of payments. Aggregate savings are 10.7 percent of GDP in (2011-12) as compared to 13.6 percent in (2007-08). Domestic savings have also declined from 11.5 percent of GDP in (2007-08) to 8.9 percent of GDP in (2011-12). Net foreign resource inflows are financing the saving investment gap. Theoretically, there are two ways of improving the savings-investment gap. One is through increasing savings and the other is through decreasing investment. Pakistan needs to gear up both savings and investment to enhance the employment generating ability of the economy as well as increase resource availability for investment. During the period July-March (2011-12) an amount of Rs. 160,266.9 million has been collected through National Savings Schemes and earned commission amounting to Rs. 801.3 million.

Table 1. Cross country comparisons of Gross Savings (% of GDP)

Country	1970s	1980s	1990s	2000s	2000s	2014	2015-16
Pakistan	14.1	21.8	24.5	21.2	23.0	20.9	22
Japan	32.3	31.8	31.8	30.8	26.0	30.5	23
India	20.0	19.2	21.5	24.1	31.2	23.2	31
Bangladesh	6.0	5.5	16.4	22.4	32.3	16.5	21.4
Australia	30.9	27.1	23.7	20.7	21.8	24.8	27.5
Canada	23.0	22.9	20.4	17.9	23.0	21.5	21.4
United States	21.5	22.3	20.5	19.2	17.8	20.3	16.7
World	23.7	24.2	23.5	23.1	23.4	23.6	25.0

Source: calculated by authors from WDI (2016)

The above table 1 shows that Pakistan as compared to other countries has never been able to achieve a sustainable and impressive savings to GDP ratios. Similarly, according to World Economic Outlook (2008), the average savings to GDP ratio of world has increased from 22.1 percent to 23.8 percent by the year 2010, further increasing to 25.0 % (WDI, 2015). However, developed countries altogether save up to 33.6 (2010) which has increased from 24 % (1990s). Whereas, developing countries having similar institutional structure like Pakistan are also saving as high as 45.5 percent (2010). It is dismal to see that Pakistan lies on a mere figure of 14.3 % savings to GDP ratio (2010) and 22% in 2015-16. The highest value over the past 38 years was 27.4% for the year 1983, while its lowest value was as low as 14.41% in the year 1976 for Pakistan. According to PES (2014), the resource gap has expanded up to four percent in the recent fiscal years (2008-2014), particularly due to substantial decrease in savings. Figures in table 1 shows that, savings to GDP ratio of Pakistan substantially reduced from 17.8 percent in Fiscal year 2007 to 13.6 percent during Fiscal year 2008. Such trends are a matter of extreme concern and calls for strong policies to attract savings and encourage investments Pakistan.

Objective of the study

Savings are heavily influenced by economic factors as well as social and governmental behavior of economic agents. To explore the socio-economic and governance factors affecting the national saving in Pakistan, this study will prove to be milestone. This study has following objectives;

- To assess the impacts of economic factors on national savings of Pakistan
- Investigate the impacts of socio-economic & socio-governance determinants including institutions, on national savings of Pakistan considering fiscal side.

- To design future policy formulation to achieve economic growth through enhancing savings and investment in Pakistan.

Literature Review

The two key macro-economic variables are savings and investment, which can not only accelerate but also boast existing economic growth especially for the case of developing countries. Investments can only be increased only when policies are focused on national and domestic savings to uplift economic conditions of a country. Econometric models so far do not appear sufficient in developing a fully accountable model to look for determinants of savings (Kazmi, 2001). Rehanna (1993) looked at savings through the lens of economic and demographic factors by applying macro data. Her interesting findings were that APS (Average propensity to savings) showed a decrease in the years of 1969 to 1988 (Pakistan) and therefore MPS (Marginal propensity to consume) also declined by a mere figure change of 0.2. Masson (1998) employed budget deficit, government expenditures, public investment, Gross Domestic Product's growth rate, rate of inflation to look for effects on saving using different country model. The most fascinating results on savings were found by Friend (1986), who claimed that social variables such as tastes and cultural difference across countries also affect the saving rates. Data reliability and data collecting also aggravates situation in developing countries like Pakistan. The literature reviews in below sections are based on several studies made on foreign and on Pakistan's economy.

Domenech, et. Al. (1996) analyzed national saving and budget deficits, both as the ratio to GDP, this study estimates a structural VAR using a panel of eighteen OECD countries and solve the national savings and budget deficits in simultaneous equations to calculate the permanent savings shock and the transitory budget deficit shocks. For this, they have used autoregressive models of national saving and budget deficits and by using the error-terms of each model they analyzed the shocks that how they affect the structure of national saving. The purpose of the study is to test the Ricardian Equivalence hypothesis i.e government spending is indifferent of how it is financed. The tested if whether or not the shocks acted as to offset the increased private saving in response to decreased public dis-saving. Moreover, in the presence of shocks yet Ricardian Equivalence Hypothesis does not exist. So, results suggest that in the sample of OECD countries there is no Ricardian Equivalence Hypothesis.

Cebula(1997) empirically examined the interstate determinants of geographic differentials in the saving and loan failure rate in the United States for the data from 1989 to 1991. As, 12 percent of the observations of the dependent variable was zero, so, to deal with the problem of hetroskedasticity, hetroskedastic-Tobit estimation technique is used. The results suggests that the failure of the S&L rate differential is affected by the average annual growth rate in gross state product, the percent of gross state product deriving from oil and natural gas extraction, the S&L cost of deposits, and the remaining average balance on outstanding fixed rate mortgage loans at S&Ls.

Dirschmid and Glatzer (2001) analyzed that the last few decades have seen a decline in the household saving rate in Austria and other industrial countries. Using an error correction model, this study found that in Austria personal saving decisions are influenced by income growth, real interest rates, inflation, social security expenditures, and the general government budget balance. These findings are becoming increasingly important for economic policy, given the aging of society and the need for pension system reforms. In future, household will be required to make greater provision for them and set up their saving efforts. As the results depicts this can be achieved by taking measures to boost up the productivity that generate income growth and promote personal saving.

Gale and Orszag (2001) provide evidence that sustained budget deficits cause reduction in national savingsand increase in interest rate. This paper incorporates series of econometric specifica-

tions to test the Ricardian and non-Ricardian models. The authors found evidences of strong non-Ricardian behavior in aggregate consumption. One of the other imperative finding is that projected future deficits affect long run interest rate but the current deficits do not affect it. Estimation suggests that each percent of GDP in current deficit reduces national saving by 0.5 to 0.8 percent of GDP. But each percent of GDP in projected future unified deficits raises long term interest rate by 40 to 70 basis points.

Pradhan and Upadhayaya (2004) analyzed the consequences of government budget deficits on national savings in USA. The analysis incorporates time series data of USA of time span of 1967-1996, data set is gathered from international Financial Statistics (IFS). National saving is used as a dependent variable in the model and the independent variables ranges from budget deficits, real interest rate, real exchange rate, money supply, to demographic variables. This analysis is unique from other studies as it involves data set of almost 3 decades and prominently incorporates the measures of demographics and the interest rates. Methodology employed is vector error co-integration to check the long run relationship among the variables. Moreover, Engle and Granger test is applied to find the short run dynamics of the model. An error correcting model is incorporated after examining the time series properties with the help of Engle and Granger test. The study concludes that the increased budget deficits lead to reduced national saving and the demographic variables positively affect the national saving.

Narayan and Siyabi(2005) examined the determinants of national savings of Oman for the period 1977-2003. By using the ARDL model, they estimate the long run and short run determinants of national savings. The most important findings are that the current account, the urbanization rate, and the money supply, which exert statistically significant impact. Meanwhile domestic credit and per capita income have no significant impact on the national savings of Oman in the long run. Urbanization and money supply have negative relation while the domestic credit, per capita income and current account surplus positively relate with national savings.

Nwachukwu and Egwaikhide (2007) examined the determinants of private saving in Nigeria. The study compares the estimation results of Error Correction Model with those of three conventional models; Partial Adjustments, Growth Rate and Static models. The study concludes that ECM performs much better than the other models. The results of study elaborates that the saving rate rises with the level of disposable income but falls with the rate of growth of disposable income. The real interest rate on bank deposits has a significant negative impact while public savings seems not to crowd out private saving. Furthermore, external terms of trade, inflation rate, and external debt service ratio have a positive impact on private saving. Below table 2 shows some of the prominent literature on the relevant subject.

Table 2. Potential Determinants of National Savings

Authors	**Econometric Technique**	**Determinants of Savings**
Masson(1998)	Co-Integration Approach	*Budget Deficit, Government Expenditures, Public Investment, Gross Domestic Product's Growth Rate, Rate Of Inflation*
Friend (1986)	Primary Data Technique Using Multiple Regression	*Social Variables I.E Taste And Cultural Differences*
Dipietro (2009)	Cross-Country Regression Analysis	*Government Size, Government Efficiency, Trade Openness, Manufacturing To GDP Ratio, Age-Dependency Ratio*

Authors	Econometric Technique	Determinants of Savings
Ahmad, M. H. Et, Al. (2004)	Johansen-Juselius Co-Integration Technique	*Demographic Variables, Income, Economic Growth, Real Interest Rate, Inflation Rate*
Nwachukwu And Egwaikhide (2007)	Error-Correction Model By Using Co-Integration Approach	*Real Interest Rate, Disposable Income, External Terms Of Trade, Inflation Rate, External Debt Service Ratio.*
Pradhan (2001)	Co-Integration Approach	*Budget Deficit, Real Interest Rate, Real Exchange Rate, Money Supply, Demographic Variables*
Vincelette (2006)	OLS	*Income, Inefficient Fiscal Policy, Financial Development, Demographic Factors*
Dirschmid And Glatzer (2004)	Error-Correction Model By Using Co-Integration Approach	*Inflation, Income Growth, Real Interest Rates, Social Security Expenditures, General Government Budget Balance*
Naryan And Siyabi (2005)	ARDL Approach	*Current Account, Urbanization Rate, Money Supply, Domestic Credit, Per Capita Income*
Sharif Imran, Et, Al. (2014)	ARDL Approach To Co-Integration	*Fiscal And Monetary Determinants*
Nasir And Khalid (2004)	Co-Integration Approach	*GDP Growth Rate, Government Current Expenditures To GDP Ratio, Terms Of Trade, Real Interest Rate, Worker's Remittances, Budget Deficits*
Shahnazi (2014)	Simultaneous Equation Model Techniques	*Corruption, Population, Governance, Trade On Domestic Savings.*

Source: Developed By the Authors

Concluding there is a need of such study which emphasized socio-governance factors particularly role of corruption as determinants of national saving in Pakistan in both fiscal and monetarist sides. However, this study only takes one aspect i.e. fiscal policy, bearing in mind the convince and time of policy makers.

Theoretical Framework

Following Mankiw (2005), we can write the following equation for national income;

$Y = C + I + G + NX$ …….. (1.1)

Note that we can write the equation for a country with open economy Y = GDP, C = Consumption, I = Investment, net exports is given by NX. We can write equation 1.1, as below;

$Y - C - G - NX = I$ …….. *(1.2)*

Since, I – S (savings) as per the accounting identity we can write equation 1.2 as below;

$S = Y - C - G - (NX)$ …… *(1.3)*

Total savings are a product of private and public savings

Public savings $= T - G$ …….. *(2.1)*

Private savings $= Y - T - C$ …… *(2.2)*

Note that, T = taxes, and G = government expenditures. Thus we can write equation (1.3) as;

$S = (Y - T - C) + (T - G) + NX$ …….. *(1.4)*

Following paper by Chaudhry (2014) National savings depends on budget deficit, government expenditures, government savings, and government taxes on a fiscal front. However, he has

missed the role of Net exports as a major determinant of savings, thus considering (5.6) we can write the equation as: *NS = f (BD, RIR, GDP, GNE and NX) ……. (1.5)*

The above equation 1.5 looks at all the relevant derived determinants of national savings on fiscal savings. However, few papers have also looked to find the role of socio-governance variables on savings. Shah Nazi (2014) looks at the impact of corruption, population, governance, trade on domestic savings along with other macro-economic variables on savings in selected Asian countries (panel data set). The results confirmed that, corruption seemed to be the most significant variable in affecting savings. Additionally, trade, governance also showed a significant impact on savings. However, population came to be, of no consequence on national savings, in panel studies. Considering, this we can also look for the role of each mentioned socio-governance variables for the case of Pakistan as well which will add novelty to the study. We can thus write the following equation derived from (1.4) & (1.5):

NS =f (BD, GDP, GNE, RIR, NX, ADR, COC,) ……. (1.6)

In the above equation, BD = budget deficit, GNE= government expenditures, GDP= gross domestic product, NX= net exports, ADR= age dependency ratio, COC= control of corruption, RIR= real interest rate. Thus, we can mark Fiscal school of thought along with socio-governance variables are;

NS = β0 + β1GDP + β2BD + β3 GNE + β4 NX + β5COC + β6 ADR + β7RIR + μ …(3)

Budget deficits (BD) are total government revenues less total expenditures. If it is positive then there is a budget surplus and in case of negative value it is affirmed as a budget deficit. Sometimes budget deficit have positive influence on national saving as according to the Ricardian Equivalence theory. Usually it is negatively predisposed by the public saving as according to Hussain (2001). How so ever sometimes it has a negative influence on private savings because of irrationality of consumers.

The general government financial consumption expenditures (GNE) including both the purchase of final goods and services, or gross domestic product, and transfer payments known to be as government spending. It excludes government military expenditures.

Gross Domestic Product (GDP) is the total value of all goods and services produced by the residents of the nation within the boundaries of the country in a given year.

Net Exports (NX) are the difference between a country's total value of exports and total value of imports. Depending on whether a country imports more goods or exports more goods, net exports can be a positive or negative value. The data of next exports are taken as percentage of GDP.

Control of corruption (COC) is defined as the extent to which power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests. It is one of the governance indicators.

Age Dependency Ratio (ADR) is used in this study as a demographic variable. ADR is the ratio of dependents (people younger than 15 or older than 64) to the working-age population (those ages 15-64).

From the above equation 3, the unrestricted error correction version of the ARDL model for Fiscal side with socio-governance factors is generated;

$$\Delta NS = \beta_0 + \beta_1 BD_{t-1} + \beta_2 GDP_{t-1} + \beta_3 GNE_{t-1} + \beta_4 NX_{t-1} + \beta_5 ADR_{t-1} + \beta_6 COC_{t-1} + \beta_7 RIR_{t-1} + \sum_{i=0}^{n} \beta_8 \Delta BD_{t-i} + \sum_{i=0}^{n} \beta_9 \Delta GDP_{t-i} + \sum_{i=0}^{n} \beta_{10} \Delta GNE_{t-i} + \sum_{i=0}^{n} \beta_{11} \Delta NX_{t-i} + \sum_{i=0}^{n} \beta_{12} \Delta ADR_{t-i} + \sum_{i=0}^{n} \beta_{13} \Delta COC_{t-i} + \sum_{i=0}^{n} \beta_{14} \Delta RIR_{t-i} + \mu \ldots . (4)$$

In the above equation 4, the first part represents the long run dynamics of the model while the second part represents the short run relationship in which Δ represents the first difference operator, μ represents the white noise disturbance term and the equation indicates that the National Saving

tends to be influenced and explained by its past values so it involves other disturbance or shocks. Therefore (4) was modified in order to capture and absorbs certain economic shocks.

The ARDL approach involves two steps for estimating Thelon run relationship [Pesaran et al. (2001)]. In the 'first step' the existence of long run relationship between the variables is established by testing for the significance of the lagged variables in an error correction mechanism regression. After that the first lag of the levels of each variable are added to the equation to create the error correction mechanism equation and then F-statistics is calculated to checked whether all the variables are jointly significant or not. If the calculated value of F-statistic is greater than the tabulated value, we reject the null hypothesis and accept the alternative hypothesis that there exists long run relationship among the variables.

The null and alternative hypothesis is as follows:

H_0 : β1 = β2 = β3 = β4 = β5 = β6 = β7 = β8 = 0 …. *(5.1)* (No long run relationship)

H_1 : β1 ≠ β2 ≠ β3 ≠ β4 ≠ β5 ≠ β6 ≠ β7 = β8 ≠ 0 …. *(5.2)* (long run relationship exists)

The f-test has a nonstandard distribution, which depends on whether variables included in the model are I(0) or I(1) , the number of regressors and whether the model contains an intercept and/or trend. Given a relatively small sample size of 27 observations, the critical value used are as reported by Narayan (2004), which based on small sample size between 25 to 80 observations. The test involves asymptotic critical value bounds, depending whether the variables are I(0) or I(1) or mixture of both. Two sets critical value generated which one set refers to the I(0) series and the other for the I(1) series. Critical values for the I(1) series are referred to as upper bound critical values. While the critical values for I(0) series are referred as the lower bound critical values. If the calculated f-statistics is larger than the upper bound critical value, then the null hypothesis of no co-integration is rejected and we can conclude that there is evidence of a long run relationship between the variables irrespective of whether the variables are I(0) or I(1). If the test statistics is below the lower bounds, then the null hypothesis of no co-integration cannot be rejected and if it falls inside the critical value band, the test is inconclusive.

If there is evidence of long run relationship of the variables, the following long run model is estimated.

$$NS_{(P)} = \beta_1 + \sum_{i=0}^{n} \beta_2 \Delta NS_{t-i} + \sum_{i=0}^{n} \beta_3 \Delta BD_{t-i} + \sum_{i=0}^{n} \beta_4 \Delta GDP_{t-i} + \sum_{i=0}^{n} \beta_5 \Delta GNE_{t-i} + \sum_{i=0}^{n} \beta_6 \Delta NX_{t-i} + \sum_{i=0}^{n} \beta_7 \Delta ADR_{t-i} + \sum_{i=0}^{n} \beta_8 \Delta COC_{t-i} + \sum_{i=0}^{n} \beta_9 \Delta RIR_{t-i} + \mu \ldots (5.3)$$

Whereas, i ranges from 1 to selected lag length.

Once co-integration is established, lag length is selected for each variable. The ARDL method estimates $(n+1)^k$ number of regressions in order to obtain optimal lag length for each variables, where n is the maximum number of lag to be used and k is the number of number of variables in the equation. The model can be selected using the model selection criteria like Schwartz-Bayesian criteria (SBC) and Akaike's Information Criteria (AIC). SBC is known as the parsimonious model: selecting the smallest possible lag length, whereas AIC is known for selecting the maximum relevant lag length. From annual data, Pesaran & Shin (1999) recommended choosing a maximum of 2 lags. From, this the lag length that minimizes SBC is selected. The ARDL specifications of the short run dynamics can be derived by constructing an Error Correction Model (ECM) of the following model:

$$\Delta NS(P) = \beta_1 + \sum_{i=0}^{n} \beta_2 \Delta NS_{t-i} + \sum_{i=0}^{n} \beta_3 \Delta BD_{t-i} + \sum_{i=0}^{n} \beta_4 \Delta GDP_{t-i} + \sum_{i=0}^{n} \beta_5 \Delta GNE_{t-i} + \sum_{i=0}^{n} \beta_6 \Delta NX_{t-i} + \sum_{i=0}^{n} \beta_7 \Delta ADR_{t-i} + \sum_{i=0}^{n} \beta_8 \Delta COC_{t-i} + \sum_{i=0}^{n} \beta_9 \Delta RIR_{t-i} + \beta_{10} ECM_{t-1} + \mu \quad \ldots. (6)$$

The ECM_{t-1} is the error correction term, defined as:

$$ECM_t = NS(P) + \beta_1 + \sum_{i=0}^{n} \beta_2 \Delta NS_{t-i} + \sum_{i=0}^{n} \beta_3 \Delta BD_{t-i} + \sum_{i=0}^{n} \beta_4 \Delta GDP_{t-i} + \sum_{i=0}^{n} \beta_5 \Delta GNE_{t-i} + \sum_{i=0}^{n} \beta_6 \Delta NX_{t-i} + \sum_{i=0}^{n} \beta_7 \Delta ADR_{t-i} + \sum_{i=0}^{n} \beta_8 \Delta COC_{t-i} + \sum_{i=0}^{n} \beta_9 \Delta RIR_{t-i} \ldots\ldots\ldots (7)$$

All coefficients of short run equation are coefficient relating to the short run dynamics of the model convergence to the equilibrium and $\boldsymbol{\beta_{10}}$represents the speed of adjustment.

Now we consider the model for the monetarist side

$$NS = \beta 0 + \beta 1\ INF + \beta 1\ M2 + \beta 3\ RIR + \beta 4\ RER + \beta 5\ NOB + \beta 6\ COC + \beta 7\ ADR + \mu \quad (8)$$

To ascertain the goodness of fit of the ARDL model, diagnostic test and stability tests are conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroskedasticity associated with the model. The structural stability test is conducted by employing cumulative sum of recursive residuals (CUSM) and the cumulative sum of square of recursive residuals (CUSUMSQ). The CUSUM and CUSUMSQ statistics are updated recursively and plotted against the break points. If the plots of CUSUM and CUSUMSQ stay within the critical bonds at 5 percent level of significance, the null hypothesis of all coefficients in the given regression are stable and can't be rejected.

CUSUM and CUSUMSQ tests are less powerful because the confidence interval of the tests is approximated. CUSUM and CUSUMSQ test can't derive the explicit distribution, and therefore approximated confidence interval is conventionally used in testing the stability of the coefficients. By using Monte-Carlo technique, we can find the confidence interval of CUSUM and CUSUMSQ test. By using the exact confidence interval calculated through Monte-Carlo technique the CUSUM and CUSUMSQ test are run conventionally on approximated confidence interval that is why the degree of accuracy is not reliable.

Data used in this study has been taken from the following sources;

World Bank, World Development Indicators (2013)

State Bank Of Pakistan (Financial Stability Review 2013)

Handbook Of Statistics On Pakistan Economy (2012)

Economic Survey Of Pakistan (2012-2013) & (2013-2014)

Worldwide Governance Indicators WGI 2015

International Monetary Fund, International Financial Statistics (IFS Year Book 2012)

Results

Fiscal & Socio-governance determinates of National Savings (Long Run)

The above results show that data is integrated at I (0) and I (1), thus we can successfully apply ARDL technique to find short run and long run parameters. Below table (3) shows long run parameter for selected fiscal variables.

Table 3. Long-Run Dynamics for Fiscal variables on National savings as dependent variable

Regressors	Coefficients	S.E	T-Ratios	Probabilities
LGDP	49.559	19.027	2.604	0.0218*
BD	-0.425	0.317	-1.339	0.2034

Regressors	Coefficients	S.E	T-Ratios	Probabilities
LNX	124.613	22.290	5.590	0.0001*
LGNE	-77.164	19.356	-3.986	0.0016*
COC	9.055	2.590	3.496	0.0039**
LADR	-179.714	50.668	-6.507	0.0000*
RIR	0.975	0.253	3.853	0.0020*

*Source: Calculated by authors Note that * Shows 1 percent level of significance and ** shows 5 percent of level of significance.*
*Absence of any * shows that variable has an insignificant impact.*

The results in table 3 depict long run associations of socio-economic determinants of national savings. Seven fiscal determinates including Gross domestic product (LGDP), budget deficit (BD), net exports (LNX), government expenditures (LGNE), control of corruption (COC), age dependency ratio (LADR) and real interest rate (RIR). All the variables are taken in log form to get more precise results as per the requirements. The results shows that GDP, net exports, government expenditure, control of corruption, age dependency ratio and real interest rate share a long run relationship with national savings. However, only budget deficit doesn't have a long run relationship with national savings. The co-efficient of GDP is positive and significant, which shows that increase national savings contribute to augment national income in long-run. However, in another paper by (Ahmed & Mahmood, 2013) GDP has insignificant impact on national savings in long run. The role of budget deficit is insignificant in the case of our thesis. The reason could be that budget deficit is usually financed by loans/ borrowing rather than savings. Hence, budget deficit acts in no way to contribute to increase national savings from last 25 years. Government expenditures also affect negatively national savings in long run. However, another paper by (Chaudhry, et all, 2014) finds a significant impact of budget deficit in LR.

A raise in government expenditures, lowers national savings and hence have a negative relationship in Long-run. More exports and imports would increase national savings in LR as more revenue may be generated. The results are similar to as (Chaudhry et all, 2014) Also, it will lead to generation of more employment opportunities which would lead to increase in domestic and national savings positively. Control of corruption would breed efficiency and transparency in system, leading to more employment opportunities. Selections based on merit and flow of money in the hands of deserving, which would eventually increase national savings in LR. As the number of aged people increases, national savings decrease and hence the results show a negative relationship with age dependency ratio in long-run. Lastly, the results of real interest rate are exactly according to the theory. A negative sign of real interest rate is expected when the dependent variable is investment and a positive for national savings.

Fiscal & Socio-governance determinates of National Savings (Short Run)

Table 4. Short-Run Dynamics (Error Correction Representations)

Regressors	Coefficients	S.E	T-Stat.	Probab.
D(LGDP)	72.96	10.900	6.693	0.0000*
D(BD)	0.27	0.087	3.126	0.0080*
D(BD(-1))	0.19	0.908	2.141	0.0518**
D(LNX)	96.00	9.757	9.839	0.0000*
D(LGNE)	-34.40	6.367	-5.403	0.0001*

Regressors	Coefficients	S.E	T-Stat.	Probab.
D(LGNE(-1))	29.83	5.505	-5.412	0.0001*
D(COC)	1.49	0.981	1.515	0.154
D(LADR)	-212.39	171.233	-1.240	0.237
D(LADR(-1))	1522.56	180.928	8.415	0.0000*
D(RIR)	0.23	0.065	3.536	0.0037*
D(RIR(-1))	-0.30	0.060	-5.053	0.0002*
Ecm(-1)	-0.90	0.095	-9.463	0.0000*

Source: Calculated by authors
*Note that * Shows 1 percent level of significance*
*And ** Shows 5 Percent Of Level Of Significance.*
*Absence Of Any * Shows That Variable Has An Insignificant Impact.*
Optimal Lag Length Is Determined By The Schwarz Bayesian Criterion (Sbc).

Table 5. Model Descriptive Statistics

R^2	0.915134
Adjusted-R^2	0.791098
Dw-Statistics	2.3
AIC	3.636932
SBC	4.543907
F Stat	9.482567 [0.0000]

Source: Calculated By Authors

Table 5 shows short run dynamics for the dependent variable; national savings on selected variables; Gross domestic product (GDP), budget deficit (BD), net exports (NX), government expenditures (GNE), control of corruption (COC), age dependency ratio (ADR) and real interest rate (RIR) including their lagged predictors. The above results can be represented in below equation;

*ECM = GS - 49.5593*LGDP -0.4256*BD + 124.6130*LNX -77.1647*LGNE + 9.0560*COC -179.7147*LADR + 0.9759*RIR … (7)*

The ECM term included in the equation (see table 4) of national savings shows a significant impact on dependent variable; savings. The coefficient of determination (R_2 & adjusted R square) is 0.915 & 0.79 as per table 4. The result shows that nearly 91 percent (R square) of variation in national savings is caused by variations in the explanatory variables. The Durbin Watson statistics is 2.3; which shows the absence of auto correlation. In the short-run, the equation of national savings suggests that all explanatory variables except control of corruption current and age dependency ratio have insignificant impact on saving rate. Note that the above tables 4 show Short Run results of impacts of only fiscal variables on National savings variables and monetary side is explored further. All variables are taken in log as per the requirement of modeling. It is imperative to make a note of that significance of lagged variables is quite helpful in policy decision. Gross domestic product (current as well as lagged) acts significantly at 1 percent significance level to national savings; which shows that current GDP affect national savings significantly. A better saving ratio, may increase GDP or vice a versa in short run.

Current and lagged budget deficit also affects national saving in short run but not in long run as per the previous results of table 4. However, another paper by (Chaudhry et all, 2014) finds budget deficit insignificant in SR but significant in LR. The reason is that budget deficit, is mainly representing that there is shortage of saving and thus, the country needs to borrow to fulfill it's cur-

rent expenditures. The improved is control of corruption (institutions) in a country, it will improve efficiency of system and the economy will improve, resulting in efficient management of resources, more investment sources and savings in long run. However, institution variable, such as control of corruption, is not expected to show an immediate result and hence it is long run phenomenon, this is the very reason why COC is insignificant in SR but significant in long run. The positive and significant impact of ADR ratio (lagged) are as expected according to the theory; as the age dependency ratio increases, so does the savings. However, another paper found significant of dependency ratio Ghana, which is contradictory to our findings (Kawakwa, 2014). The results of current and lagged real interest rate are also as predicted, it has a positive relation with national savings (current) as per the literature review. However, lagged interest has a significant and negative relationship with national savings, which is validation to study by (Kawakwa, 2014). The relationship with investment is negative but opposite for national savings. Lastly, government expenditures also significantly impacts national savings in long run as well as short run for both lagged and current values. However, (Chaudhry et. all, 2014) finds insignificant result of government expenditures in SR.

Diagnostic Tests Fiscal & Socio-Governance determinates of National Savings

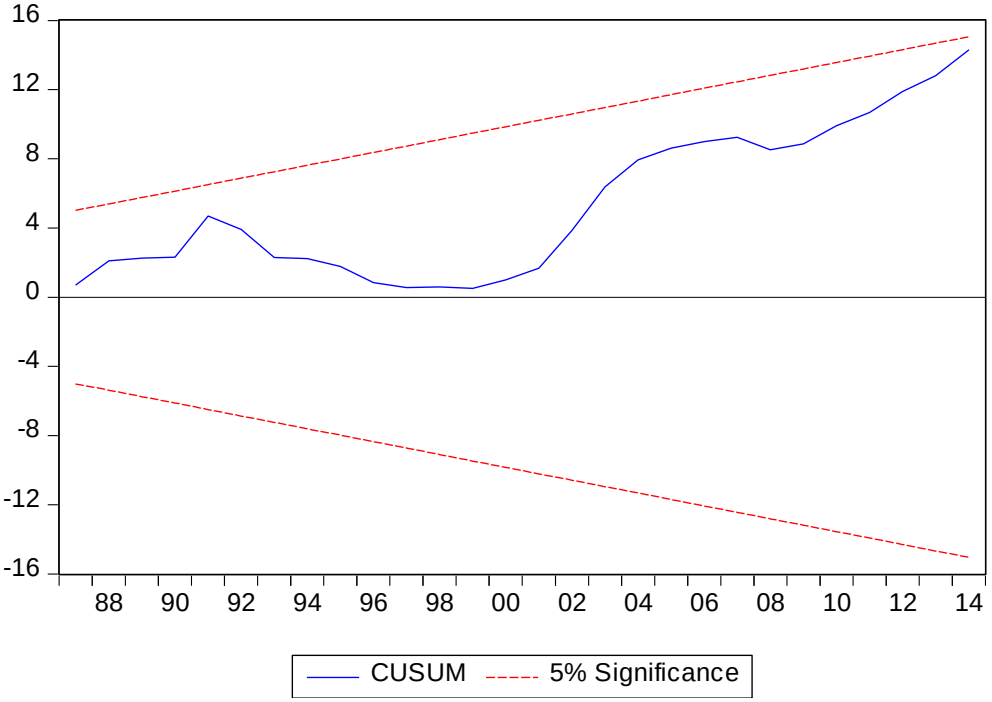

Figure 1. CUMSUM Test ***Source: Calculated by authors***

Finally, the CUMSUM and CUMSUMQ plots (see figure 1 & 2) are estimated to check stability of the long run and short run parameters for the selected ARDL approach (Fiscal side). If the plots of the two figures 1 & 2, CUMSUM & SUMSQ stats, lies within the critical bonds of 5 percent level of significance, the null hypothesis (H_0) of all the co-efficient in the given regression of ARDL are stable and thus, cannot be rejected. Our examinations of figure 1 and 2, show that CUMSUM & CUMSQ stats are well within the 5 percent of critical bounds. This implies that SR & LR co-efficient in the ARDL error correction model are stable and reliable.

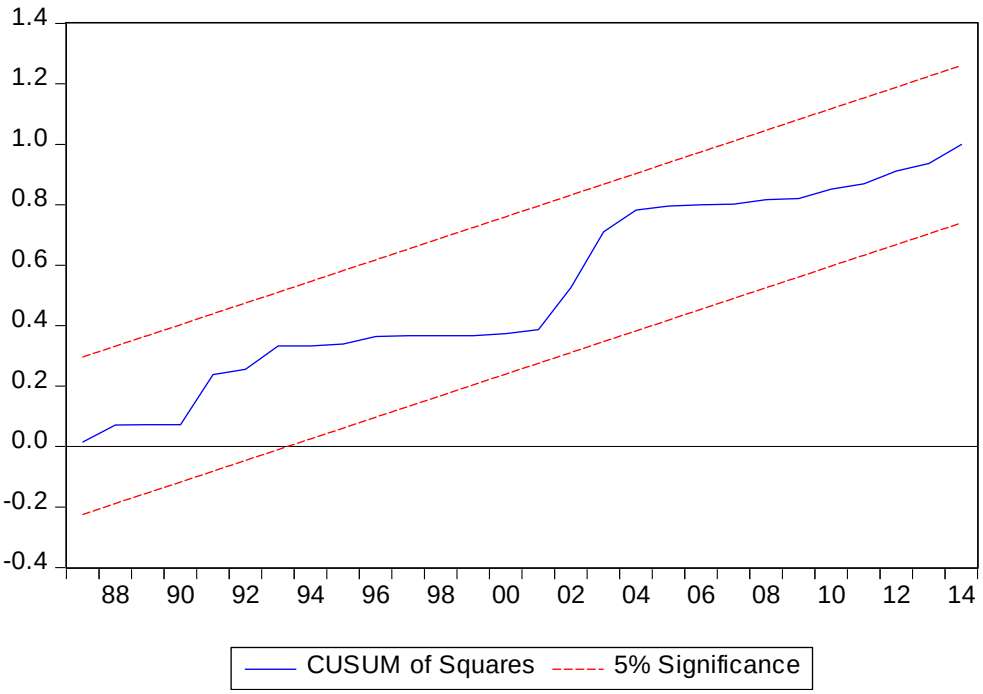

Figure 2. CUSUMQ TEST. ***Source: Calculated by authors***

Table 6 Diagnostic Tests

	Test application	CHSQ	Probab.
Serial correlation	Lagrange Multiplier	2.894616	0.2352
Normality	Test for skewness kurtosis	0.5673	0.8195
Hetro-skedasticity	Breusch-pagan-Godfrey	4.4735	0.7239
Wald test			
Test statistics	Value	df	Probab.
F-statistics	5.906	(6,19)	0.0013
Chi-square	35.436	6	0.0000

Source: Calculated by authors

Table 6 shows diagnostic tests to remove data errors in model. The results show that there is no serial correlation, data is normally distributed, and there is no hetroskedascity. Wald test is used to check significance of co-efficient and the results shows that co-efficient are efficient.

Conclusion and Policy Guidelines

The results from ARDL show that gross domestic product, net exports, government expenditures, control of corruption, age dependency ratio and real interest rate shares a long run relationship with national savings. However, only budget deficit doesn't have a long run relationship with national savings. The ECM term included in the equation (refer to table 6.5) of national savings shows a significant impact on dependent variable; national savings. The coefficient of determination (R^2 & adjusted R square) are 0.915 & 0.79, which shows model is a good fit and captures nearly 79 percent of variations. On the other hand, the short-run parameters suggests that all explanatory variables except control of corruption (current year) and age dependency ratio has significant impact on saving rate. Control of corruption is an institutional variables and hence breeds results in long run rather

than short run. Strong institutions such as control of corruption (taken as socio-economic determinant of national savings) would breed efficiency and transparency in system which would lead to more employment opportunities. Moreover, it may aid in selections based on merit and flow of money in the hands of deserving, which would eventually increase national savings in LR. Current year's and lagged budget deficit also affects national saving in short run.

It is thus imperative to resolve this issue for the sustainable high economic growth that lies in high savings rate. From the analysis carried out the following policy suggestion emerges;

Fiscal instrument must be used effectively to stimulate the economic factors that heavily influenced national saving rate. GDP is one of the major economic factor that significantly affect the savings of Pakistan. To have high income is obligatory in order to derive high savings. Pakistan enjoys high GDP in preceding years due to foreign inflows. Foreign inflows gave initial boost to the economy but domestic savings has been the key in sustaining rapidly increasing domestic investment. Unfortunately, this high income can't derive savings, as consumerism prevails in the whole economy. Now, policies should be designed in order to capture the foreign investment to give initial boost to the economy and then facilitating policies for the savers must come in front to raise the level of domestic savings. Worker's remittances and age dependency ratio also plays an important role in this regard, favorable investment opportunities must be generated in order to attract the remittances and generate employment opportunities that in turn raise the national savings level.

Budget deficits and government expenditures has a negative impact on national saving. Government must adopt austerity that must be designed as it would be least harmful. Imposed austerity from the creditors of Pakistan is always harmful because the creditors are concerned about their loans rather than economic development. Government must cut its non-productive expenditures in order to raise public savings.

Control of corruption has negative effect on national saving in both short run and long run. The results are such because corruption is not controlled in country and hence performs no better in long run. This is because the governance policies and political stabilities are very week in our country. Only by having established democratic institutions, we may win the fight against corruption. Policies must be adopted to espionage to identify and explore cases of administrative and economic corruption in the country so that control of corruption become positive and new investments made in the country.

This is not to say that country should only focus on anti-corruption measures: there are many other very persuasive reasons why all aspects of institutional quality should be improved. Indeed, improvements on one dimension are almost certain to lead to improvements in others. Nevertheless, in order to put themselves on a more sustainable growth pathway, we recommend that Pakistan as a priority strive to reduce the corrupt practices that stymie growth and make it unproductive.

The high dependency ratio caused by the rapid increase in population has been the most important factor causing the saving rate to remain depressed in the long run. One earning member has is responsible for 6 to 7 non-earning member of the household. Hence, saving rate remains depressed in long run mostly. Slowing down population growth should be the key policy objective of the government.

Government size also magnificently effects the savings in Pakistan. Huge cabinet leads to unsustainable budget deficits, as the revenue is less than the expenditures. Pakistan must reduce its government size in order to cope with low saving rates. Furthermore, government must also make investment in profitable projects to raise its revenues and regulate the system of tax as well.

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Appendix

Table A1. Correlation matrix

	NS	LGDP	BD	LNX	LGNE	COC	LADR	RIR
NS	1							
LGDP	-0.4	1						
BD	0.4	-0.2	1					
LNX	-0.2	0.2	0.1	1				
LGNE	-0.4	0.9	-0.2	0.2	1			
COC	0.6	0.01	0.07	-0.14	-0.01	1		
LADR	0.3	-0.9	0.3	0.15	-0.8	-0.09	1	
RIR	-0.05	0.1	-0.2	-0.16	0.15	-0.12	-0.15	1

Source: Estimated by author by using data from different PES.

Table A2. Descriptive stats

	NS	LGDP	BD	LNX	LGNE	COC	LADR	RIR
Mean	22.81	12.37	-4.48	1.14	11.42	-0.95	1.90	0.46
Median	21.71	12.38	-4.56	1.14	11.46	-0.93	1.93	0.82
Max	30.43	13.40	5.06	1.23	12.43	-0.69	1.94	7.13
Minimum	16.88	11.37	-8.06	0.99	10.37	-1.96	1.81	-6.77
Observation	36	36	36	36	36	36	36	36

Source: Estimated by author by using data from different PES.

Table A3. Order of Integration (unit root Analysis) /Unit Root Estimation

Variables	Intercept	Intercept & trend	Order of integration
LNS	-7.170873*	-7.117131*	I(1)
LGDP	-6.282966*	-6.242676*	I(1)
BD	-6.028211*	-6.018448*	I(0)
LGNE	-6.868503*	-7.00113*	I(1)
LNX	-6.21710*	-6.288703*	1(1)
COC	-3.825681*	-3.785691*	I(0)
LADR	-5.01509*	-4.978793*	I(1)
RIR	-5.113879	-4.059284	I(0)

*Note: the lag length for the ADF was selected using Schwarz Bayesian Criterion (SBC), * represent the level of significance at 1% , having critical value -3.6382, -4.234972, -3.540328, -3.202445 with intercept, intercept & trend at level and at first difference.*

Table A4. Tests for ARDL

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	5.906163	(6, 19)	0.0013
Chi-square	35.43698	6	0.0000

Null Hypothesis: C(2)=0, C(3)=0, C(4)=0, C (5)=0, C(6)=0, C(7)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(2)	0.585374	0.241535
C(3)	0.223431	0.387450
C(4)	-0.078648	0.172732
C(5)	0.051995	0.486095
C(6)	0.720462	0.378324
C(7)	5.264141	2.632152

Restrictions are linear in coefficients.