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Abstract:

The present paper contributes in existing economic literature by investigating the validation of the Keynesian Absolute Income hypothesis in Pakistan by applying the ARDL approach to cointegration. The findings of this paper indicate the validation of the Keynesian absolute income hypothesis in Pakistan, where public savings and financial development add in private savings. This study opens up new insights for government to improve the level of private savings.

JEL Classification: E2, C4

Keywords: Private savings, Co-integration, Pakistan

1. Introduction

The Permanent Income Hypothesis (PIH) of Friedman (1957) explained the households consumption decisions depends on their permanent income rather than present income. The major contribution of the Friedman study is that the elasticity of consumption which is influenced by the change in income. There is also some empirical evidence on the permanent income hypothesis in the existing literature such as Kelley and Williamson, (1968) and Gupta, (1970, 1971). Second, Ando and Modigliani's life cycle hypothesis postulates that "individuals smooth their consumption over lifetime and live by accumulating savings during peak earning years which help them to maintain their consumption levels during retirement". Other empirical studies highlight the impact of demographic factors on private savings' behavior, such as age groups (Kelley and Williamson, 1968); birth rates (Leff, 1969 and 1971); dependency ratios (Gupta, 1971); financial variables such as interest rate (Ouliaris, 1981) and inflation rate (Koskela and Viren, 1982) etc.

Pakistan is an emerging growing economy in South Asia. It is suitable to test the impact of economic growth on private savings i.e. Keynesian Absolute Income Hypothesis. Foreign savings could be an important determinant of national savings to smoothen external liquidity constraints. Muradoglu and Taskin, (1996) found that foreign savings are not significant in influencing household savings. Empirical evidence rather supports a negative relationship between foreign savings and national savings [see Fry, (1995); Giovannini, (1983)]. Exports have a positive impact on private savings as "increased demand for exported goods leads to increased output leading to an increase in savings". For example, Lee (1971) corroborated the hypothesis that the level of domestic savings vary with level of exports. The terms of trade are another possible determinant for both public and private savings. The decline in terms of trade

provides the indication to the domestic residents to increase their savings at current period in order to sustain their standard of living in future periods[1]. An improvement in terms of trade leads to an increase in savings along-with trade balance improvements (Fry, 1995; Masson et al. 1995). In contrast, Paiva and Sarwat (2003) exposed that external terms of trade, not only has a positive impact on private savings but also on public savings.

In Turkey, Ozcan et al. (2003) claim that the negative influence of life expectancy gives the provision of the life-cycle hypothesis and inflation control the degree of macroeconomic synchronization and has a positive impact on private savings[2]. According to the Indian experience, Athukorala and Sen, (2004) find that demographic trends, real interest rate, and the inflation rate affecting savings and that public savings seem to crowd out private savings, but less than proportionately[3]. Paiva and Sarwat, (2003) used Brazilian data and concluded that private savings are inversely correlated with public savings and a 1 percent increase in public savings pushed gross national savings upward by 0.2 percent if all else is same. Alain and Pelgrin, (2003) reported that private savings in OECD countries have been significantly influenced by public savings, the demographic structure of the population, the growth rate of labor productivity, changes in the terms of trade, and the real interest rates. Bulíř and Swiston, (2006) explained that in Mexico, private savings are adversely affected due to reliance on

[1] In theory, terms of trade changes are already a part of real GDP. However, in practice the price deflators used in national accounting generally allow only for changes in the general level of prices and fail to capture price structural effects on the level and growth of real income such as those due to changes in the terms of trade. Thus changes in *TOT* can be expected to have an additional effect to that of changes in GDP on savings (Athukorala and Sen, 2004)

[2] Income level has a positive impact on the private saving rate and growth rate of income is not statistically significant. Private credit and real interest rates try to capture the severity of the borrowing constraints and the degree of financial repression for Turkey.

[3] Other factors that effect private savings like the spread of banking facilities in the economy and the rate of inflation seem to have a positive impact and changes in the external terms of trade and migrant remittances a negative impact on private saving.

external savings, relatively high population dependency ratio, and less developed financial system.

The literature on economic growth and private savings is inconclusive [see Carrol and Weil, (1994); Edwards, (1996); Hussain, (1996); Loayza et al. (2000); Ozcan et al. (2003); Athukorala and Sen, (2004) and, Paiva and Sarwat (2003)]. Modigliani's (1970) life-cycle model reveals productivity growth makes working young richer than old and the young save more while old dissave[4]. Moreover, Carroll and Weil (1994) argued that people adjust consumption habits slowly, which makes savings positively correlated with current growth of income. The relationship between interest rates and private savings is uncertain (see Schmidt-Hebbel and Serven, 1999) while Ogaki et al. (1995) explored the sensitivity of private savings with rate of interest. They argued that private savings are more reactive to rates of return at higher income levels. At lower income levels, people cannot smooth out consumption over time. This implies that intertemporal elasticity of substitution between present and current consumption varies with the level of wealth. Literature also reveals that an important reason to save is the precautionary motive, as people save more at times of indecision apprehending the possibility of difficult times ahead. Such a source of uncertainty is of macroeconomic nature. This can be reflected in high and inconsistent inflation, exchange rate volatility, cycles of boom and contraction, instability in the financial system. One reply to these uncertainties is capital flight as people leave domestic assets due to this uncertainty (see for details; Edwards, 1996 and Taylor, 1996).

[4] Aggregate income growth would follow from increasing the lifetime profiles for succeeding generations. In turn, habit formation in consumption is a factor that helps to diminish the positive correlation between savings and growth. Economic agents will have negative savings when they are young and have very low income, positive savings during their productive years and negative savings when they are old and retired (Modigliani, 1970)

Low fiscal deficits or surpluses build up national savings, as complete Ricardian equivalence has been refuted empirically (i.e. an increase in public savings is not fully offset by a decline in private savings). This type of effect is stronger in developing countries subject to survival consumption and liquidity constraints (see Corbo and Schmidt-Hebbel, 1991). The evidence confirms that government savings partially offset private savings with the offset coefficient in the range of 40-70 percent[5]. Dayal-Gulati and Thimann, (1997) empirically observed that fiscal policy particularly social safety arrangements influence private savings. Macroeconomic stability and financial deepening appear to be important determining factors of savings behavior in the Southeast Asia and Latin American economies. Furthermore, Edwards (1996) incorporated some policy related, demographic, structural, and political variables to determine both public and private savings. The domestic savings (both private and public) are strongly influenced by the output growth per capita. However, political uncertainty has negative influence on public savings. Ozcan and Ozcan, (2000) explained that the real per capita income is positively associated with private savings, which corroborates the life-cycle hypothesis. However, they are statistically insignificant and similarly the Ricardian equivalence does not hold callously [6].

In general, private savings is influenced by the age distribution of the population. This fundamental thought is applicable to the retired people [Lahiri, (1989); Edwards, (1996); Dayal-

[5] This means that 1 percentage of additional government savings (in terms of GDP) adds about 0.5 percentage of GDP to national savings.

[6]Loayza, et al. (2000) the mean saving rate for MENA countries drops to 0.24 when the rate for Arab Emirates is excluded. Excluding three high saving countries (Kuwait, Bahrain and Arab Emirates), the mean saving rate becomes 0.22. The median value is 0.25. If only seven MENA countries (Egypt, Iran, Jordan, Morocco, Syria, Tunisia and Turkey) are considered the mean saving rate drops to a low of 0.17 which is almost equal to the world saving rate. This paper also examines empirical determinants of private saving for a sample of economies in the Middle East and North Africa (MENA) over the period 1981-1994. It argues that the mean saving ratio for the selected MENA countries is over the mean world saving ratio (0.26 vs. 0.16, respectively)

Gulati and Thimann, (1997), Loayza et al. (2000)]. Paul et al. (1993) suggested that public savings and foreign savings partially offset private savings in developing countries. In addition, they found that demographics and growth rates are important determinants of private savings. There are many studies about the impact of financial liberalization on private savings in a number of both developed [(Bayoumi, (1993a, b); Caporale and Williams, (2001); Chapple, (1991)] and developing countries [Melo and Tybout, (1986); (Bandiera et al. (2000); Dayal-Gulati and Thimann (1997) and; Fry, (1995); Hussain, (1996); Jbili et al. (1997); Loayza and Shankar, (2000)]. However, their results are ambiguous.

Recently, Jongwanich (2010) investigated the impact of economic growth, inflation and terms of trade on private savings using data of Thailand. The empirical results exposed that economic growth and terms of trade increase private savings but inflation declines it. Keho, (2011) investigated the determinants of private saving in case of West African Economic and Monetary Union countries by applying the ARDL bounds testing approach. The results showed that financial liberalization plays important role to explain private saving behavior for sampled countries. Sackey, (2011) reported that international remittances play a significant role to boost private saving in case of Ghana. Johnson, (2011) investigated the presence of Life Cycle Hypothesis in case of Nigeria. The empirical results indicated that economic growth, growth in disposable income and real interest rate have positive effect on private savings. Additionally, public savings crowd out private savings. Matur et al. (2012) examined the determinants of private savings using Turkish data. They applied Johansen cointegration and found the presence of cointegration among the series. Their empirical evidence reported that public savings, income per capita, financial development, old and young dependency ratios, exchange rate, urbanization

crowd out private savings. Disposable income per capita, inflation, real interest rate, money supply, female labor force participation, direct and indict taxes have positive effect on private savings. Larbi, (2013) examined the impact of financial liberalization, income per capita, inflation and fiscal deficit on private savings in case of Ghana. The author found that financial liberalization, income per capita and inflation have positive impact on private savings. The Ricardian Equivalence hypothesis is validated in Ghana because fiscal deficit increases private savings.

In case of Pakistan, Burney and Khan (1992) found that the burden of high dependency ratio reduces household savings. Husain (1996) analyzed the long-run behavior of savings and exposed that financial development adds in private savings. High rates of population growth have kept the age structure of Pakistan's population virtually unchanged. Later on, Farhan and Akram (2011) identified the determinants of private savings by applying the ARDL bounds testing and error correction method (ECM). They found that income growth is positively linked with household savings but inflation and age dependency ratio lower it. Ismail and Rashid, (2013) also re-examined the determinants of household savings. Their empirical evidence reported that inflation reduces household savings but income per capita increases it. Public savings and old dependency ratio add in household savings.

In this paper, our contribution is not in terms of methodology. It is rather in terms of findings. In this present study, the ARDL bounds testing procedure to cointegration is applied to examine the long run relations between the real private savings, real GDP, real domestic credit to private sector, real public savings, political instability dummy and real agriculture value-added per

capita. This approach is suitable for small sample data. The ARDL bounds testing is flexible regarding order of integration. We can apply it if our variables are integrated at I(0) or I(1) or having mixed order of integration. This approach provides consistent and efficient empirical evidence compared to conventional cointegration approaches. For short run dynamics, we use error correction method (ECM) and long run marginal impact of independent variables is investigated by applying OLS regression. Our findings show the presence of long run relationship among the variables. We find that the Keynesian absolute income hypothesis holds in case of Pakistan for long and short runs. Furthermore, public savings and financial development add in private savings and agriculture growth enhances the propensity of people to save in Pakistan.

2. Modeling, and Methodological Framework, and Data

We begin with the following basic equation of private savings for Pakistan. In the present study, private savings and other variables are in log-form except that of political instability. A log-linear model provides more comprehensive estimates than the simple-linear form [Bowers and Pierce, (1975); Ehrlich, (1975); Ehrlich, (1977); Layson, (1983); Cameron, (1994) and Ehrlich, (1996)][7].

$$\ln PS_t = \gamma_\circ + \gamma_Y \ln Y_t + \gamma_{INF} \ln INF_t + \gamma_{FD} \ln FD_t + \gamma_{PUB} \ln PUB_t + \gamma_{PL} PL_t + \gamma_{AGR} \ln AGR_t + \mu_t \qquad (1)$$

where, PS_t is real private savings per capita, Y_t is real GDP per capita, INF_t is inflation proxies by consumer price index, FD_t is real domestic credit to private sector per capita proxy for

[7] For more details see Shahbaz et al. (2010)

financial development, PUB_t is real public savings per capita, PL_t is for political instability (D = 0 where there is democratic period otherwise zero), AGR_t is real agriculture value-added per capita and μ_t is error term assumed to be normally distributed.

The data period of study consists on 1972-2011. Data on real GDP, consumer price index, real domestic credit to private sector and real agriculture value added to GDP has been obtained from economic survey (various issues) of Pakistan. The monthly statistical bulletin of State Bank of Pakistan is combed to collect data on real private savings and real public savings. We have use population series to convert all series into per capita except consumer price index.

Statistical literature provides many econometrical techniques to investigate the cointegration among the macroeconomic actors in development economics. In this study, the autoregressive distributed lag (ARDL) approach for cointegration by Pesaran et al. (2001) has been employed. Recent studies have indicated that the ARDL bounds testing approach to cointegration is preferable to other conventional cointegration approaches such as Engle-Granger (1987), and Hansen (1996). One of the reasons for preferring the ARDL technique is that it is applicable irrespective of whether the underlying regressors are purely $I(0)$, purely $I(1)$ or mutually cointegrated. This procedure is the familiar with Wald test or F-statistics in a generalized Dickey-Fuller type regression, which is used to test the significance of lagged levels of the variables under consideration in a unrestricted equilibrium error correction model (UECM)

(Pesaran et al. 2001)[8]. We use the augmented ARDL (p, q_1, q_2, …… q_k) developed by Pesaran and Pesaran, (1997); Pesaran et al. (2001) as following:

$$\alpha(L,p)y_t = \alpha_\circ + \sum_{i=1}^{k}\beta_i(L,q)x_{it} + \lambda' w_t + \varepsilon_t \qquad (2)$$

$$t = 1,\ldots\ldots\ldots,n$$

where

$$\alpha(L,p) = 1 - \alpha_1 L - \alpha_2 L^2 - \ldots\ldots\ldots - \alpha_p L^p$$
$$\beta_i(L,q_i) = \beta_{i\circ} + \beta_{i1}L + \beta_{i2}L^2 + \ldots\ldots\ldots + \beta_{iq_i}L^{q_i}, i = 1,2\ldots,k$$

Where independent variable is y_t, constant term is α, lag operator is denoted by L such that $Ly_t = y_t - 1$, w_t is $s \times 1$ vector of deterministic variables for example constant term, time trend, or independent variables having appropriate lags. The x_{it} in equation-2 is the i independent variable where $i = 1, 2, \ldots, k$. we may write long run empirical model with constant term as following:

$$y = \alpha_\circ + \sum_{i=1}^{k}\beta_i x_i + \delta' w_t + \nu_t \qquad \Omega = \frac{\alpha_\circ}{\Omega(1,p)} \qquad (3)$$

The long run impact of x_{it} variables on y_t variable can be examined by:

$$\phi_i = \frac{\hat{\beta}_i(1,\hat{q})}{\alpha(1,\hat{p})} = \frac{\hat{\beta}_{i\circ} + \hat{\beta}_{i1} + \ldots\ldots + \hat{\beta}_{i\hat{q}}}{1 - \hat{\alpha}_1 - \hat{\alpha}_2 - \ldots - \hat{\alpha}_p} \quad \forall i = 1,2,\ldots,k \qquad (4)$$

[8] Another reason for using the ARDL approach is that it is more robust and performs better for small sample sizes (such as in this study) than other co-integration techniques.

Where $\hat{p}_i$ and $\hat{q}_i$, $i = 1, 2, \ldots, k$ show the estimates of $\hat{p}$ and $\hat{q}_i$, $i = 1, 2, \ldots, k$. we may estimate long run coefficients using following equation:

$$\pi = \frac{\hat{\lambda}(\hat{p}, \hat{q}_1, \hat{q}_2, ..., \hat{q}_k)}{1 - \hat{\alpha}_1 - \hat{\alpha}_2 - ... - \hat{\alpha}_p} \tag{5}$$

The OLS estimates of the ARDL model are $\hat{\lambda}(\hat{p}, \hat{q}_1, \hat{q}_2, ...\hat{q}_k)$ for equation (2). Following Pesaran et al. (2001), we can obtain long run as well as short run estimates using general to specific version of the ARDL bounds testing as following:

$$\Delta y_t = \Delta\alpha_\circ - \alpha(1, \hat{p})EC_{t-1} + \sum_{i=1}^{k} \beta_{i\circ} \Delta x_{it} + \lambda' \Delta w_t - \sum_{j=1}^{\hat{p}-1} \alpha^{\bullet} j \Delta y_{t-1} - \sum_{i=1}^{k} \sum_{j=1}^{\hat{q}_{t-1}} \beta_{ij} \Delta x_{i,t-j} + \varepsilon_t \tag{6}$$

where ECM is the error correction model and it is defined as follows:

$$ECM_t = y_t - \alpha - \sum \hat{\beta}_i x_{it} - \lambda' w_t \tag{7}$$

x_t is the k-dimensional forcing variables, which are not co-integrated among them. ε_t is a vector of stochastic error terms, with zero means and constant variance-covariance[9]. There are two steps to apply the ARDL bounds approach to cointegration. In first step, we examine the presence of

[9] The existence of an error-correction term among a number of co-integrated variables implies that changes in dependant variable are a function of both the levels of disequilibrium in the co-integration relationship (represented by the ECM) and the changes in the other explanatory variables. This tells us that any deviation from the long run equilibrium will feed back on the changes in the dependant variable in order to force the movement towards the long run equilibrium (Masih and Masih, 2002).

long run relationship between the variables following appropriate lag length selection. We have followed Akaike information criteria to select lag length. Secondly, we estimate long run as well as short run coefficients using equation-6. The second step applied once cointegration between the variables is confirmed (Narayan and Smyth, 2005). The unrestricted intercept and unrestricted trend (Pesaran et al. 2001) version of the ARDL model is as following:

$$\begin{aligned}\Delta PS_t = {} & c_\circ + c_1 t + \pi_{PS} PS_{t-1} + \pi_{GDPC} GDPC_{t-1} + \pi_{INF} INF_{t-1} + \pi_{FD} FD_{t-1} + \pi_{NS} NS_{t-1} \\ & + \pi_{PL} PL_{t-1} + \pi_{AGR} AGR_{t-1} + \sum_{i=1}^{p-1} \psi_{PS} \Delta PS_{t-1} + \sum_{i=0}^{p-1} \psi_{GDPC} \Delta GDPC_{t-1} + \sum_{i=0}^{p-1} \psi_{INF} \Delta INF_{t-1} \\ & \sum_{i=0}^{p-1} \psi_{FD} \Delta FD_{t-1} + \sum_{i=0}^{p-1} \psi_{NS} \Delta NS_{t-1} + \sum_{i=0}^{p-1} \psi_{PL} \Delta PL_{t-1} + \sum_{i=0}^{p-1} \psi_{AGR} \Delta AGR_{t-1} + \mu_t\end{aligned} \tag{8}$$

The Wald test (F-statistics) for the null hypothesis $H_\circ : \pi_{PS} = \pi_{GDPC} = \pi_{INF} = \pi_{FD} = \pi_{NS} = \pi_{PL} = \pi_{AGR} = 0$ and alternative hypothesis $H_1 : \pi_{PS} \neq \pi_{GDPC} \neq \pi_{INF} \neq \pi_{FD} \neq \pi_{NS} \neq \pi_{PL} \neq \pi_{AGR} \neq 0$. The asymptotic distributions of the F-statistics are non-standard under the null hypothesis of no co-integration relationship between the examined variables, irrespective of whether the variables are purely *I*(0) or *I*(1), or mutually co-integrated. Two sets of asymptotic critical values provided by Pesaran and Pesaran, (1997). The first set assumes that all variables are *I*(0) while the second set assumes that all variables are *I*(1). If the computed F-statistic is greater than the upper bound critical value, then we reject the null hypothesis of no co-integration and conclude that there exists steady state equilibrium between the variables. If the computed F-statistic is less than the lower bound critical value, then we cannot reject the null of no co-integration. If the computed F-statistic fall within the lower and upper bound critical values, then the result is inconclusive. In this case, following Kremers et al. (1992) and Bannerjee et al. (1998), the error correction term will be a

useful way of establishing co-integration. The second step is to estimate the long-run coefficient of the same equation and the associated ARDL error correction models.

3. **Empirical Results and their Discussion**

Finding the order of integration of private savings with the battery of other variables is pre-requisite to investigate cointegration through employing the ARDL bounds testing for long run association. It is necessary for ARDL bounds testing that variables should be integrated at I(0) or I(1) or I(0)/I(1). In doing so, Ng-Perron, (2001) unit root test is applied to make sure that no variable is having 2^{nd} difference order of integrating. ADF, P-P and DF-GLS tests are not reliable for small sample data sets due to their poor size and power properties (Dejong et al. 1992; Harris and Sollis, 2003). These tests seem to over-reject the null hypotheses when it is true and vice versa. Ng-Perron, (2001) unit root test seems to solve this problem. The results of Ng-Perron unit root test are reported in Table-1. We find that that NP does not show problem of unit root and fond to be stationary at level i.e. I(0). The rest of the variables such as and $\ln Y_t$, $\ln INF_t$, $\ln FD_t$, $\ln PUB_t$, PL_t and $\ln AGR_t$ are integrated at 1^{st} difference i.e. I(1) with intercept and trend. This shows that variables do have mixed order of integration. In such situation, the ARDL bounds testing approach to cointegration is suitable to examine long run relationship among the variables.

Table-1 Unit Root Decision

Ng-Perron at Level				
Variables	**MZa**	**MZt**	**MSB**	**MPT**
$\ln PS_t$	-17.1170***	-2.9226	0.1707	5.3406
$\ln Y_t$	-9.9499	-2.0689	0.2079	9.8475
$\ln INF_t$	-12.3493	-2.4631	0.1994	7.4959
$\ln FD_t$	-8.6076	-2.0732	0.2408	10.5911
$\ln PUB_t$	-6.2820	-1.7722	0.2821	14.5055
PL_t	-5.8560	-1.7076	0.2916	15.5548
$\ln AGR_t$	-8.1999	-2.0197	0.2463	11.1278
Ng-Perron at 1st Difference				
Variables	**MZa**	**MZt**	**MSB**	**MPT**
$\ln PS_t$	-16.4721***	-2.8648	0.1739	5.5616
$\ln Y_t$	-14.8009***	-2.6531	0.1792	6.5437
$\ln INF_t$	-17.6476**	-2.9689	0.1682	5.1727
$\ln FD_t$	-21.1204**	-3.2479	0.1537	4.3246
$\ln PUB_t$	-22.0988**	-3.3238	0.1504	4.1251
PL_t	-18.4298**	-3.0353	0.1647	4.9457
$\ln AGR_t$	-36.3298*	-4.2391	0.1166	2.6325
Sensitivity Analysis				

Serial Correlation LM, F = 0.4197(0.6617)
ARCH Test = 0.4165(0.6630)
Normality J-B Value = 1.0310(0.5971)
Heteroscedisticity Test, F = 1.0011(0.4833)
Ramsey RESET Test, F = 0.1213(0.7303)
Note: ***, ** and * show significant at 1%, 5% and 10% respectively.

We have to select appropriate lag order of the variables using unrestricted VAR. The appropriate selection of leg length is helpful to compute ARDL F-statistic in examine whether cointegration exists or not. We select lag length which is 2 in our sample data and our results are based on Akiake information criterion (AIC). The AIC performs better in selection of lag length due to its superior power properties. Our results of the ARDL bounds testing are reported in Table-2 that our calculated F-statistic is more than upper critical bound at 10 percent level of significance following Pesaran et al. (2001). One may conclude that there prevails a cointegration between private savings and its macroeconomic determinants.

Table-2 ARDL Bounds Testing

Lag Order		**F-Statistic**
2		**4.571***
	Pesaran et al. (2001) [a]	**Narayan P (2005)** [b]

Critical Value	Lower Bound Value	Upper Bound Value	Lower Bound Value	Upper Bound Value[10]
1 percentage	5.15	6.36	6.140	7.607
5 percentage	3.79	4.85	4.183	5.333
10 percentage	3.17	4.14	3.393	5.050
Note: * there is cointegration among running actors in concerned model.				

Table-3 Long Run Elasticities

Dependant Variable = $\ln PS_t$						
Variable	**Coefficient**	**Prob-values**	**Coefficient**	**Prob-values**	**Coefficient**	**Prob-values**
Constant	-8.4580	0.0062	-1.2653	0.5717	-2.5544	0.0219
$\ln PS_{t-1}$	-	-	0.2603	0.0764	-	-
$\ln Y_t$	0.5171	0.0027	0.4475	0.0052	0.3762	0.0047
$\ln PUB_t$	0.0245	0.0002	-	-	0.0428	0.0000
$\ln R_t$	-	-	-	-	0.0135	0.0026
$\ln INF_t$	-0.1746	0.0020	-	-	-	-
$\ln AGR_t$	1.3718	0.0015	-	-	-	-

[10] [a] Critical values are obtained from Pesaran et al. (2001), Table CV (IV): Unrestricted Intercept and no Trend
[b] Critical values are obtained from Narayan (2005), Table CV (IV): Unrestricted Intercept and no Trend, p.1990.

$\ln FD_t$	0.5413	0.0099	-	-	-	-
PL_t	-0.1173	0.0357	-	-	-	-
$\ln INV_t$	-	-	0.0790	0.0003	-	-
$\ln TOT_t$	-	-	0.8730	0.0046	-	-
$\ln PREM_t$	-	-	-	-	-0.1484	0.0000
$\ln DPEN_t$	-	-	-0.0540	0.0754	-	-
$\ln M3_t$	-	-	-0.0167	0.9688	-	-
$\ln M2_t$	-	-	-	-	0.5254	0.0304
$\ln ER_t$	-	-	-	-	-0.0588	0.3747
R-Squared = 0.7699 Adj-R-Squared = 0.7223 Durbin-Watson = 2.0964 F-Statistic = 16.1798			R-Squared = 0.6549 Adj-R-Squared = 0.5809 Durbin-Watson = 2.0671 F-Statistic = 8.8571		R-Squared = 0.8046 Adj-R-Squared = 0.7642 Durbin-Watson = 1.7801 F-Statistic = 19.906	

The marginal impact of macroeconomic determinants on private saving is reported in Table-3. We find that economic growth (income per capita) is positively linked with private savings. It is statistically significant at 1 per cent level of significance. A 1 per cent increase in economic growth (income per capita) increases private savings by 05171 per cent, all else is same[11]. This supports the "Keynesian absolute income hypothesis". These findings are consistent with Modigiliani (1986) and, Hussain and Thirlwall, (1999) who claimed that rise in income per capita increase savings capacity which is the most important determinant of economic growth.

[11] see for more details; Edwards, (1996)

The relationship between public and private saving is positive and significant at 1 per cent level. A 1 per cent increase in public savings pushes the private savings upwards by only 0.0245 per cent by keeping other things constant. The impact of macroeconomic instability declines private savings and it is statistically significant at 1 per cent by keeping other things constant. More than 65 per cent population of Pakistan lives in rural areas and more than 90 per cent of rural population is associated with agricultural sector (AGR) directly and indirectly. Boost in economic activities of agricultural sector definitely improves the economic situation of village population. This also raises their power to save. The relation between agricultural growth and private savings is positive at 1 per cent level of significance. We find that a 1 per cent increase in agricultural growth raises private savings by 1.37 per cent, all else remain same. The impact of financial development is positive and it is statistically significant at 1 per cent. Keeping other things constant, a 1 per cent increase in financial development may raise private savings 0.5413 per cent[12] [enhancement in credit to private sector as share of GDP][13]. The link between political instability (PL_t) and private savings is negative and it is statistically significant at 5 per cent. The political instability lowers private savings via lowering investment activities. The decline in investment activity is linked with an increase in unemployment. The increased unemployment lowers private savings.

The impact of private savings in current period is positively linked with private savings in future. A 1 percent increase in private savings in current period will raise private savings in the future by 0.2603 per cent by keeping other remain same (see for details; Bulir and Swiston, 2006). The relationship between investment and private savings is positive and it is statistically significant at 1 per cent. Investment generates employment opportunities for both skilled and

[12] Two indicators of financial development Credit to private sector as share of GDP and M2/GDP utilized.
[13] See Loayza, Schmidt-Hebbel and Servin (1999).

unskilled labor. This indicates the importance of investment to improve the private savings in Pakistan. A 0.0790 per cent increase in private savings is linked with a 1 per cent increase in investment, all else remain same.

The terms of trade ($\ln TOT_t$) is also a determinant of private savings. This implies that a permanent deterioration in terms of trade is linked with high savings in previous period just to maintain their standard of living in current period confirmed by ADY, (1976); Paiva and Sarwat, (2003). In case of Pakistan, higher private savings are associated with deterioration of terms of trade. A 1 per cent deterioration in terms of trade reduces private savings by 0.8730 per cent by assuming other things constant.

Dependency ratio is taken as demographic variable (DPEN)[14] to examine its impact on private savings according to precautionary savings model. We find that low savings are allied with high dependency ratio. This confirms the Deaton's (1991) buffer stock approach to private savings in Pakistan. All other factors remain same, a 1 per cent increase in dependency ratio retards private savings. Accumulated wealth ($\ln M3_t$) lessens marginal propensity to save of individuals in Pakistan but it is insignificant. The relationship between quasi money supply ($\ln M2_t$) and private savings is positive and it is significant at the 5% significance level. A 1 per cent raise in money supply is boosted private savings by 0.5254 per cent, all else is same.

We find that the relationship between interest rate and private savings is positive at 1% level of significance. This shows that a rise in interest rate is linked with present consumption rather than future consumption (substitution effect) and this inclines the people to increase savings[15]. Thus, savings respond positively due to rise in the interest rates only if the substitution

[14] This shows the dependency ratio

[15] However, if the household is a net lender, the interest rate rise also raises lifetime income, and thus tends to increase consumption and decrease saving (the income effect).

effect is stronger than the income effect. It is argued that real interest rate affects private savings positively in Pakistan. In Pakistan, savings process is money concentrated because of limited portfolio choices. Due to change in interest rate, substitution effect dominates income as savings come from small individuals compared to elite class population. Private savings and foreign remittances move in opposite directions. The main reason is that the recipients of remittances find no incentives to save their money in banks. Initially, they spend their money on consumption needs. With the passage of time, recipients of remittances invest their money in construction of houses, real estates, and waste huge amounts of money on wedding ceremonies. Finally, financial reforms seem to have negative correlation with private savings but it is not insignificant.

We have applied error correction model (ECM) to obtain short run dynamic relationship and results are reported in Table-4. We find that estimate of lagged error terms is negative and it is statistically significant. The statistical significance of lagged error term with negative sign shows the speed of adjustment from short run towards long run equilibrium path.

Table-4: Short Run Behavior

Dependent Variable = $\Delta \ln PS_t$			
Variable	**Coefficient**	**T-statistic**	**prob. value**
Constant	0.0098	0.3328	0.7418
$\Delta \ln Y_t$	0.5144	1.6510	0.1103
$\Delta \ln FD_t$	0.4659	1.8781	0.0712

$\Delta \ln AGR_t$	1.3731	2.3528	0.0262
$\Delta \ln PUB_t$	0.0229	3.4736	0.0017
$\Delta \ln INF_t$	-0.0938	-1.7849	0.0855
ΔPL_t	-0.0201	-0.4665	0.6446
ECM_{t-1}	-1.0998	-5.2048	0.0000
R-squared = 0.7995 Adj-R-squared = 0.7475 Durbin-Watson = 1.849 F-statistic = 15.3831 AIC = -1.3585 SBC = -1.0030			

The coefficient is -1.0998 for short-run model implies that deviation from the long-term in private savings is corrected by 109.98 per cent every year. Significance of error term is another proof of established long run relationship between private savings and its determinants in case for Pakistan. Table-4 shows that increase in GDP per capita improves the private savings but it is insignificant. Financial development increases private savings at 10 per cent level. Enhanced public savings and increased contribution of agriculture sector to GDP push individuals to save more. Macroeconomic instability declines the private savings and it is statistically significant at 10 per cent level. Political instability retards private savings but it is insignificant. The model passes all sensitivity analysis tests and indicates that there is no serial correlation and same inference is drawn for autoregressive conditional heteroscedisticity. The error term is normally distributed and there is no white heteroscedisticity. Ramsey Rest test indicates that the model is well specified.

4. Conclusion and Policy Implications

This study explained the possible association between private savings and macroeconomic determinants in Pakistan during the period of 1972-2011. The ARDL approach has been employed to investigate the long run relations between these variables. Our empirical evidence highlights that previous savings hike probability to save more in forthcoming periods to obtain profits and to smooth out their consumption. This implies that the rise in income improves private savings and confirms the existence of Keynesian absolute income hypothesis in the country. Results also claim that public savings and financial development are positively correlated with private savings. Interestingly, agriculture sector's contribution to GDP and also improves individuals' capacity to save in the country. The empirical findings of the analysis provide the attention of monetary and political instabilities reduce private savings, whereas improvements in investment activities raise private savings through absorption of both skilled and unskilled labor that improves not only their income but also their capacity to save to smooth out their consumption. A deterioration of terms of trade that is perceived to be permanent may induce the domestic residents to increase their savings to sustain their standard of living. Demographic variable has negative impact on savings and accumulation of wealth. Interestingly we observe that increment in international remittances pushes the private savings downward in Pakistan.

In the context of policy recommendations, there is need to control inflation in the country to boost private savings. Subdued inflation not only enhances individuals' ability to save but also reduces the cost of borrowing to invest in employment generating activities. Agriculture sector is the backbone of the country but there are limited financial openings available to local peasants thus, encourage them use their savings to buy gold, houses, land etc. instead of channelizing their

savings into banks commercial or industrial investment (Shahbaz et al. 2013). There needs to implement such policies which not only promote agriculture sector but also introduce schemes to promote savings habits of peasants in the formal financial institutions. Political stability is a prerequisite in the country to attract not only local investors but also foreigners. In a friendly political environment, investors are expected to launch their long-term projects in the country, which, in turn, generate employment opportunities leading to increased private income and private savings in case of Pakistan.

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