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Research

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## MACRO AND SOCIOECONOMIC DETERMINANTS OF SAVINGS IN PAKISTAN

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### Abstract

*Due to close relationship of savings to economic growth, poverty, income inequality the analysis of the savings behavior becomes very important in development economics. The present study has analyzed the saving behavior of Pakistan for the period 1973-2013. It has been found that age dependency, foreign savings and inflation have a negative and significant relationships with all the three type of savings (i.e. national, public and private), while economic growth and financial sector development enhances savings in Pakistan. The study finds that interest rate has an insignificant impact on nationals and private savings. However, in the case of public savings the impact is positive and significant. As far as the role of taxes is concerned, it has been found that taxes discourage private savings while the impact on public savings is positive.*

**Keywords:** Savings, Interest rate, Per Capita GDP, ARDL  
Cointegration

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### Introduction

Despite the importance of foreign savings in promoting the investment the domestic savings plays crucial role for the investment in a country. Therefore, understanding saving behavior becomes very much important to understand the investment and growth prospects of an economy. In Economic literature “Permanent income hypothesis” (Friedman, 1957) and “life-cycle hypothesis” (Ando and Modigliani, 1963) are the two very popular theories that explains the saving behavior. In the permanent income hypothesis; transitory income is distinguished from permanent income in determining savings. The Permanent income is defined as expected income over a certain period, while transitory income is the difference between permanent and actual income. Theory asserts that savings are determined only by permanent income and transitory changes in income do not exhibit any significant impact of savings . According to life-cycle hypothesis, lifetime consumption of an individual is being spread over their lifetime by accumulating savings in working years and these savings are used to maintain the consumption level after the retirement period. It suggests important role of demographic factors in determining the savings.

Both the permanent income hypothesis and the life-cycle hypothesis have been tested in numerous empirical studies . In this regard the effects of various variables on savings are explored, including demographic factors e.g. dependency ratio (Agrawal et al., 2009), age groups (Kelly and Williamson ,1968), birth rate (Leff, 1971). Macroeconomic variables e.g. per capita income (Loayza et. al 2000) taxes (Hussein and Thirlwall, 1999), money supply (Ozcan et. al. , 2003) and exports (Thanoon and Baharumshah, 2012); and the financial variables like interest rates (Chen, 2002), inflation rates (Heer and Suessemuth, 2006) and financial sector deepening (Odhiambo, 2008) etc. The detailed discussion on the existing literature is provided in the section 2 of the paper.

Over the years Pakistan is facing low saving rates as compared to other developing countries and saving is hovering around 10% of GDP. As the low saving rates are not only hurting the investment in Pakistan but it is also resulting in higher reliance on external savings to finance investments in social sector as well as infrastructure. The foreign capital is made available by various international institutions with strict conditions and over dependency may lead the economy to be vulnerable to external shocks. In view of that it become important for the policy makers in Pakistan to analyze the role of various factors that plays key role in affecting savings and in view of that launch policies that encourage the saving. The present study aims to analyze the effects of a number of important factors on national as well as public and private savings in Pakistan, for the period 1973-2013.

The layout of the paper is as follow: a brief overview of the available literature is summarized in section 2. Section 3 discusses the methodology and data sources of the study. Section 4 presents the empirical results of the study. Conclusions and policy implications are given in the final section followed by references.

### **Literature Review**

Keeping in view the importance of savings in economic development, extensive literature on savings and its determinants is available.

The consumption theorists (Modigliani, 1970, 1986; Deaton & Paxson, 1994, 2000) are of the view that income and its growth determines the level of consumption and savings. Jilani et. al. (2013) concludes that government consumption and GDP growth rate have a positive while inflation has a negative impact on savings in Pakistan. However, Ahmad and Mahmood (2013) concluded that in Pakistan savings are negatively affected by per capita income, inflation and exchange rate while trade openness is having a positive relationship with savings. Hussein and Thirlwall (1999) found that

per capita income and tax revenue positively affects a country's saving capacity. Loayza et al. (2000) found that savings are highly affected with financial liberalization and growth rate of real per capita GDP. Baharumshah et al. (2003) found that capital inflows had a negative while economic growth exhibits a positive impact on savings in the short run in Philippines, Singapore, Malaysia and South Korea, however, in the long run mixed results were found. Ozcan et al (2003) found that Income, Inflation, term of trade, current account deficit and Money Supply has a positive impact on private savings in Turkey. Similarly, Jongwanich (2010) also found that growth rate has a positive impact on savings in Thailand. Furthermore, the availability of credit and terms of trade have a negative while interest rate and inflation have a positive relationship with savings.

The rising inflation rate can negatively affect the income and leads towards reduction in savings. However, an increase in inflation rate has also been used as a proxy for macroeconomic uncertainty. In this context inflation force the people to save for precautionary motives. Hence, inflation has an ambiguous effect on savings. Davidson and MacKinnon (1983) have found a positive and significant relationship between inflation and savings in the USA and Canada. However, Heer and Suessmuth (2006) concluded that in the USA inflation does not significantly affect the savings. On the other hand, Bulkley (1981) revealed a negative causal relationship between inflation and savings in UK. Sternberg (1981) also comes to the similar conclusion that inflation has a negative correlation and significant effect on savings.

According to the Keynes (1936), the effect of interest rate in the long run is subjectively changes the savings and an increase in interest rate will results in increasing the savings. According to Munir et al (2010) real interest rate is positively affecting the private investment in Pakistan. Athukorala (1998) also concluded that high interest rate has encouraged savings in India. These results are also supported by Mikesell and Zinser (1973), McKinnon (1973), Fry (1988), Glyfason (1993) and Basely et.al (1998). Chen (2002) also found the existence of

long run relationship between income, interest rates and savings in China. Gupta (1987) found that interest rate and expected inflation rate does not significantly affect savings, however, income has a significant impact on savings.

The life-cycle hypothesis suggests that working age population plays a major role in determining the savings. Schmidt-Hebbel and Servén (2000) suggested that dependency ratio is having a negative while income is having a positive impact on savings. While querying the robustness of effects of demographic factors on savings, Attanasio et al. (2000) and Hondroyannis (2006) concluded that unpredictable expenses have the capacity to change the savings pattern of the old age people. Khan, Gill & Hanif (2013) concluded that expected age, per capita income, increase in years of education and deepening of financial system have a positive impact on savings, however the dependency ratio exhibit a negative relationship with saving rate. Leff (1969) concluded that high dependency ratio is the major reason for the differences in saving rate of developing and developed countries. According to Hussain (1996) financial deepening results in increasing the private savings.

Greater availability of foreign savings may encourage more consumption, and reduce the domestic savings. According to Fry (1995) and Schmidt-Hebbel & Servén (1999) foreign and domestic savings are substitutes. Held and Uthoff (1995) and Reinhart and Talvi (1998) found that foreign savings is a substitute for domestic saving in Latin American countries. Later on Edwards (1996), Hussain and Brookins (2001) and Agrawal (2001) also supported these findings. i.e. foreign savings and national savings are substitutes.

According to Edwards (1996) and Johansson (1996) deeper financial markets improves the savings rate by offering a wider variety of financial instruments to channel savings and also providing more security to savers. Sarantis and Stewart (2001) and Hondroyannis (2006) found that in OECD countries, development of financial institutions plays crucial role in promoting the domestic savings.

However, Loayze et al. (2000), is of the view that financial depth have insignificant effect on national savings, however, credit availability exhibits a negative impact on savings. Haron and Azmi (2006) concluded that savings are positively affected by money supply.

Agrawal et al. (2009) concluded that in South Asia foreign savings, dependency rate, income, and access to banking institutions plays major role while interest rate has a very limited and inconclusive role in affecting the savings. Thanoon and Baharumshah (2012) are of the view that saving in Latin America and Asia are affected by international capital inflows, dependency ratios and exports. The economic growth positively affects savings in Asia while it has a negative impact in Latin America. Ozcan et al. (2012) found that term of trade, inflation, young dependency ratio, income, credit availability, political instability, urbanization, real interest rate and economic crisis have a positive impact on savings in Turkey. However, current account deficit, old dependency ratio, financial depth and life expectations have a negative impact on savings.

#### Data and Methodology

Keeping in view the existing literature and constrained by the reliable data availability the saving function can be described as under:

$$S_{it} = \alpha + \sum_{j=1}^k \delta_j L_{tj} + \sum_{m=1}^p \pi_m E_{tm} + \sum_{n=1}^x \sigma_n F_{tn} + \varepsilon_t$$

Where,  $S_{it}$  represents savings as percentage of GDP of  $i$ th specification; in first specification National Saving, in second specification Public Saving and in third specification private savings are used as dependent variable.  $\alpha$  denotes intercept while  $L$  is the vector of lifecycle variables i.e. age dependency ratio, per capita GDP.  $E$  represents variables that are related to the external sector i.e. current account as percentage of GDP, . The vector  $F$  consists of variables that capture the role of financial institutions i.e. M2 as percentage of GDP, taxation, real interest rate.

Time series data of Pakistan has been used for the period 1973-2013. The details of major variables and the data sources are  
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summarized in table 1:

**Table 1**  
*Details of Data*

Sr. No.	Name of Variable	Data Source	Description
1.	National Savings (SNA)	State Bank of Pakistan	The National Savings, Public Savings and Private Savings are our dependent variable in three different specifications. They are measured as percentage of GDP.
2.	Public Savings (SPU)		
3.	Private Savings (SPR)		
4.	Age Dependency (AD)	Economic Survey of Pakistan	As mentioned earlier the life-cycle hypothesis suggests that working age population plays a major role in determining the savings. The present study has used the age dependency ratio as proxy for this purpose.
5.	Financial sector Development (FD)	State Bank of Pakistan	The broad money as percentage of GDP has been used as an indicator for the financial sector development.
6.	Inflation (INF)		The CPI has been used as proxy for inflation.
7.	Interest Rate (INT)		The present study has used the weighted average rate of return on deposits as an indicator for interest rate.
8.	Foreign Savings (FS)	Economic Survey of Pakistan	The negative of the current account balance as percentage of GDP has been used as proxy for foreign savings.
9.	Taxation (TX)		Tax revenue as percentage of GDP has been used as proxy for taxation.
10.	Per Capita GDP (PG)		Modigliani (1970, 1986) and Deaton & Paxson (1994, 2000) by presenting the consumption theories concluded that income and its growth are the major determinants of consumption and savings. Per capita GDP has been used as an indicator for economic growth in the present study.

### Estimation results

In time series analysis first and foremost step is to check the stationarity of data so that the issue of spurious regression may be handled. In this regard unit root tests are being used, the results of ADF unit root test are presented in table 2.

**Table 2**  
*ADF Unit root results*

Name of Variable	Level			1st Difference		
	Intercept	Trend and Intercept	None	Intercept	Trend and Intercept	None
SNA	-	-2.914	-	-	-	-
	2.823		0.292	7.985*	8.115*	8.094*
SPU	-	-3.157	-	-	-	-
	1.476		1.805	5.688*	9.761*	9.892*
SPR	-	-	0.06	****	****	**
	3.649*	4.646*	0			**
PG	1.9	-	1.42	****	****	**
	01	4.643*	5			**
INT	-	-2.284	-	-	-	-
	1.609		0.377	5.633*	5.644*	5.709*
AD	-	-2.862	-	-	-	-
	0.644		1.376	5.469*	5.411*	6.692*
FS	-	-3.483	-	-	-	-
	2.889		1.711	6.916*	6.818*	6.995*
INF	-	-	-	****	****	**
	4.182*	5.169*	5.956*			**
FD	-	-	-	****	****	**
	3.084*	3.307*	0.708			**
TX	0.3	-1.599	-	-	-	-
	29		0.957	7.015*	7.629*	7.005*

\* Suggest significance at 5% level

The results show that model is mixture of I(0) and I(1) variables. In such circumstance, most appropriate technique is to conduct the cointegration by using ARDL approach proposed by Pesran (2001). The VECM equation for the empirical model can be written as equation A.

$$\Delta S_{it} = \alpha + \gamma_1 PG_{t-1} + \gamma_2 AD_{t-1} + \gamma_3 FS_{t-1} + \gamma_4 INF_{t-1} + \gamma_5 INT_{t-1} + \gamma_6 FD_{t-1} + \gamma_7 TX_{t-1} + \sum_{i=1}^p \omega_i \Delta PG_{t-i} + \sum_{i=0}^p \tau_i \Delta AD_{t-i} + \sum_{i=0}^p \sigma_i \Delta FS_{t-i} + \sum_{i=0}^p \beta_i \Delta INF_{t-i} + \sum_{i=0}^p \phi_i \Delta INT_{t-i} + \sum_{i=0}^p \theta_i \Delta FD_{t-i} + \sum_{i=0}^p \kappa_i \Delta TX_{t-i} + \varepsilon_t \text{-----A}$$

Where  $\alpha$  is intercept,  $\varepsilon_t$  is the error term, similarly  $\gamma_1, \dots, \gamma_7$  are the long run coefficients and  $\theta, \tau, \kappa, \phi, \beta, \pi, \sigma$  and  $\omega$  are the short run dynamic coefficients.  $S_i$  represents savings of  $i$ th specification.

The ARDL procedure started with applying the bound test for the null hypothesis of no Co-integration-i.e.

Ho:  $\gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = \gamma_6 = \gamma_7 = 0$  against the alternative hypothesis of H1:  $\gamma_1 \neq \gamma_2 \neq \gamma_3 \neq \gamma_4 \neq \gamma_5 \neq \gamma_6 \neq \gamma_7 \neq 0$

In bound F-test selection of lag length is crucial. In the present study there are 41 observations with seven parameters. In the case of such limited data (by following the Pesran(2001)), we have selected 2 as maximum lag length. The results of Bound F-test are summarized in table 3.



**Table 3**  
*Bound F test results*

Specification	F-Statistic Value	Lag length	Significance level	Bound Critical Values	
				I(0)	I(1)
National Savings as Dependent Variable	5.24	2	1%	2.0	3.13
Public Savings as Dependent Variable	3.87	2	5%	2.3	3.50
Private Savings as Dependent Variable	4.09	2	10%	2.9	4.26

For all the three specifications, the calculated value of F-statistic is above upper bound critical values at 5% significance level. It suggests the existence of co-integrating relationship among the variables.

As the cointegrating relationship is determined so the next step is to estimate the long-run coefficients for equation A. In this regard by using the Schwarz Bayesian criterion (SBC) of the lag selection, the long-run coefficients are estimated and results are represented in table 4.

**Table 4**  
*Long run estimation results*

Variables	National Savings as Dependent variable (2,1,1,0,1,0,0,1)		Public Savings as Dependent variable (1, 1,0,0,1,1,0)		Private Savings as Dependent variable (1,0,1,1,0,1,0,0)	
	Coefficient	t statistics	Coefficient	t statistics	Coefficient	t statistics
Constant	2.782 *	4.327	1.628 *	0.456	4.731 *	0.641
PG	0.030 *	2.096	0.039 *	2.209	0.064* *	3.317
INT	0.070 *	1.277	0.301 *	2.631	0.432 *	1.078
AD	- 0.285*	-1.987	--- *	---	-0.628* *	-2.357
FS	- 0.098*	-2.929	- 0.005*	-1.968	-0.394 *	-1.128
INF	- 0.308*	-4.082	-0.029 *	-0.506	-0.125* *	-3.300
FD	0.047 *	3.530	0.019 *	3.246	0.296* *	2.206
TX	-0.641 *	-1.506	0.168 *	2.032	-0.785* *	-2.546
R Square	0.677		0.280		0.664	
Adjusted R Square	0.591		0.189		0.574	
F-Statistics	7.868		3.458		7.411	
P Value of F statistic	0.000		0.009		0.000	

\* Suggest significance at 5% level

The results indicate that age dependency has a negative and significant relationship with all the three type of savings. However, coefficient of age dependency is relatively higher for private savings as compared to the public savings, suggestive of the fact that saving behavior of private savors is more sensitive to age dependency.

Similar to various earlier studies like Hussain & Brookins (2001) and Agrawal (2001)) it has been found that foreign savings have a negative impact on national savings and it can be concluded that foreign savings are substitute to savings. However, surprisingly private savings are more sensitive with foreign savings in comparison to public savings.

Inflation has a negative impact on all type of savings. However, coefficient is higher for private savings as compared to public savings. As mentioned earlier inflation have two opposite effects, the rising inflation rate can negatively affect the income and leads towards reduction in savings. However, inflation force the people to save for precautionary motives, this effect can offset the negative impact.

Similar to findings of various earlier studies it has been found that economic growth enhances the savings. It also supports the conventional consumption theories presented by Modigliani (1970, 1986) and Deaton & Paxson (1994, 2000) that income and its growth determines the level of consumption and savings.

Taxes exhibit a positive impact on Public Savings while it discourages the private savings. As far as overall impact is concerned taxes tend to reduce the national savings in Pakistan. The main reason is that the taxes reduce the disposable income of savers and results in a reduction in savings.

Study finds that interest rate is having a positive and insignificant impact on national savings in Pakistan. The impact of interest rate for public savings is positive and significant, however, in

case of private saving the impact is insignificant. It can be inferred that for private savers interest rate has insignificant role in affecting the savings. One of the reasons seems to be that due to prohibition of interest rate in Islam, interest rate have very limited role in determining the private saving behavior.

It has also been found that financial sector development has a positive and significant impact on savings. However, coefficient is smaller for public savings. As it has been found that 1 % increase in financial sector development (M2/GDP in percentage) will leads towards 0.02% increase in public savings (public savings /GDP in percentage). However, 1% increase will leads towards 0.30 % increase in private savings.

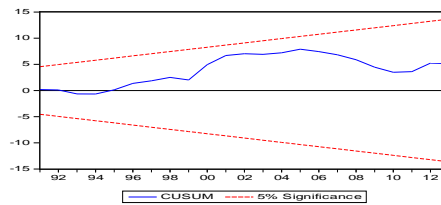
**Table 5**  
*Short run estimation results*

Variables	National Savings as Dependent variable (2,1,1,0,1,0,0,1)		Public Savings as Dependent variable (1, 1,0,0,1,1,0)		Private Savings as Dependent variable (1,0,1,1,0,1,0,0)	
	Coefficient	t statistics	Coefficient	t statistics	Coefficient	t statistics
Constant	0.101	0.429	0.046	0.125	-0.025	-0.085
D(PG)	0.002	2.340	0.510	0.483	0.005	0.125
	*					
D(PG (-1))	0.052	0.705	0.389	0.234	---	---
D(INT)	0.186	1.222	0.015	0.868	0.369	1.146
D(INT(-1))	0.022	0.101	---	---	0.041	0.126
D(AD)	-	-2.832	---	---	-0.204	-0.512
	0.927*					
D(AD(-1))	---	---	---	---	-0.288	-0.537
D(FS)	-	-4.538	-	-1.403	-0.381*	-2.822
	0.512*		0.031			
D(FS(-1))	-0.171	-1.069	---	---	---	---
D(INF)	-	-2.647	-	-0.084	-0.134	-1.688
	0.164*		0.071			
D(INF(-1))	---	---	-	-0.555	-0.159	-1.743
			0.044			
D(FD)	0.002	0.022	0.060	0.259	0.015	0.184
D(FD(-1))	---	---	1.156	1.191		
D(TX)	0.097	0.353	0.046	2.205	0.055	0.158
			*			
D(TX(-1))	-0.150	-0.564	---	---	---	---
ECT(-1)	-	-3.472	-	-6.942	-0.906*	-5.408
	0.527*		0.510*			
R Square		0.887		0.806		0.814
Adjusted R Square		0.819		0.712		0.725
F-Statistics		12.952		8.629		9.131
P Value of F statistic		0.000		0.000		0.000

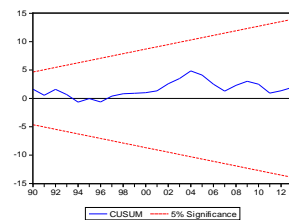
The results further confirm the existence of long run relationship among the variables as the error correction term is significant<sup>3</sup>. It also suggest that following a shock, approximately 88% of the correction back towards long-run equilibrium after one year is completed regarding National savings and 81% for both the Public and Private savings.

In the short run, per capita GDP has a positive and significant relationship with National savings, however for both private and public savings relationship was found to be insignificant. Results also reveal that taxes have a positive and significant impact only on private savings. The results also suggest that dependency ratio has a negative and significant relationship with national savings in Pakistan. The foreign savings has a negative and significant impact on national and private savings. Furthermore, inflation also exhibits a negative and significant impact on national savings.

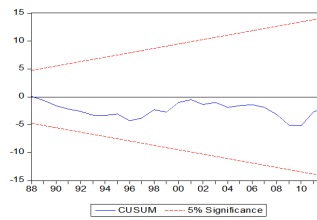
The cumulative sum (CUSUM) graphs presented as figures 1-3 are suggestive of the stability in the coefficients.



**Figure 1**  
*National Savings as dependent variable*



**Figure 2**  
*Public Savings as dependent variable*



**Figure 3**  
*Private Savings as dependent variable*

<sup>3</sup>Bannerjee et al.(1998)

### **Conclusions and Policy Implications**

Over the years, savings in Pakistan remained very low in comparison to other developing countries. Keeping in view the importance of the saving in economic development, the present study has analyzed the impacts of various socio economic factors on savings in Pakistan for the period 1973-2013. By doing so, the study has used three types of savings (National savings, Public Savings and Private Savings) as its percentage to GDP as dependent variables.

It has been found that age dependency and inflation exhibits a negative and significant relationships with all the three type of savings however, saving behavior of private savors is more sensitive to age dependency and inflation. Study also confirms the conventional wisdom that foreign savings are substitute to domestic savings. Similar to findings of various earlier studies it has been found that economic growth and financial sector development enhances the savings in Pakistan. Study finds that interest rate is having a positive and insignificant impact on national savings in Pakistan. The impact of interest rate for public savings is positive and significant, however, in case of private saving the impact is insignificant. As far as the role of Taxes is concerned it has been found that taxes discourage the private savings while having a positive impact on Public Savings.

From the results of the present study, various policy implications can be drawn for the policy makers to increase the savings in Pakistan. In order to increase the savings it is very crucial to adopt the policies that are growth enhancing, leads towards good returns for savers and easy availability of financial sector facilities. There is also need to control the inflation, dependency ratio (fewer children per couple) and over reliance on foreign savings (particularly if it is because of increased imports or external debt) in order to accelerate the savings on sustainable basis.

It is also worth noting here that it is very difficult to analyze the role of social indicators on saving behavior at macro level. Hence, it is very crucial to conduct a micro level study to further explore the role of various social factors including religion on household savings decisions. In near future a study will be conducted to further explore the saving behavior in Pakistan by using the household data.

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