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# Consumption & Savings Behavior in Pakistan

Salman Ahmed Shaikh

## Abstract

*Like many other countries, aggregate consumption constitutes a major portion of Gross Domestic Product (GDP) in Pakistan. Consumption decisions determine savings decisions. In long term growth literature, differences in long term growth had been explained to a large extent by differences in the rate of savings which also determine a country's investment in productive capacity, developing human capital and improving socio-economic infrastructure. In this study, we test three famous consumption models in the literature for their empirical verification taking macro level data for Pakistan economy. These include Keynes (1935) consumption function, Robert Hall's (1978) Random Walk Hypothesis and Milton Friedman's (1957) Permanent Income Hypothesis. Furthermore, we also run two multiple regression models using Ordinary Least Squares (OLS) approach to study the determinants of savings in Pakistan economy. The results indicate evidence of consumption smoothing and relatively stable Average Propensity to Consume (APC) in the long run. In the second set of models for analyzing determinants of saving, it was found that nominal national savings are positively related with aggregate level of income and exports while negatively related with wealth variables like total market capitalization of stocks. In line with theory, it was found that nominal national savings are negatively associated with federal debt, government expenditure and inflation. In the alternate model taking variables in growth form, it was found that national savings rate is positively related with GDP growth rate, exports to GDP ratio, remittances growth rate and negatively related with rate of inflation.*

**Keywords** *Consumption, Savings, Permanent Income Hypothesis, Random Walk Model, Keynes Consumption Function, Determinants of Savings.*

**JEL Codes** E21, G11

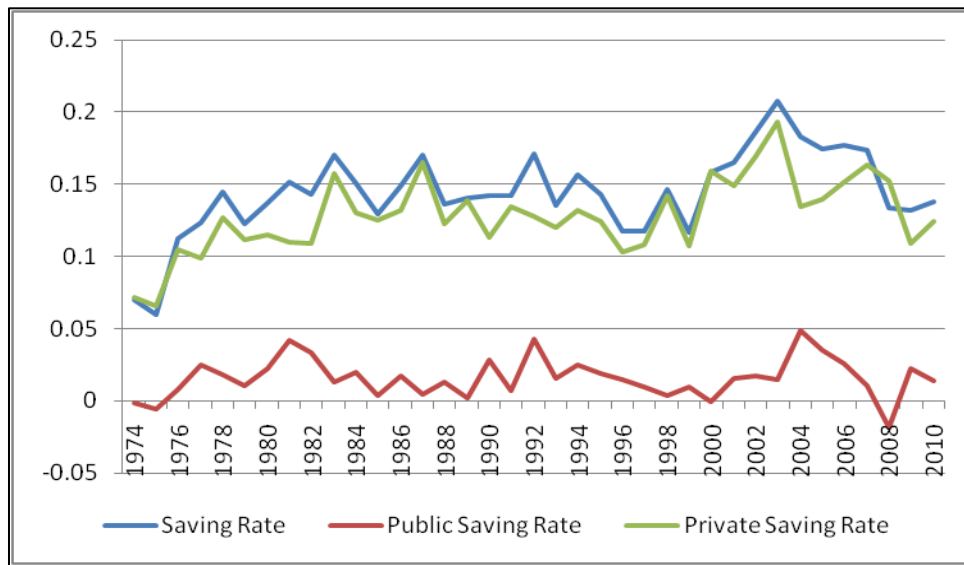
## 1. Introduction

Pakistan is one of those developing countries that have resiliently maintained decent growth despite a lot of structural problems and negative economic shocks. Average growth rate in real GDP during the last 50 years had remained at above 5% and per capita real GDP growth rate has also remained above 2%. However, when compared with East Asian countries, the country has lagged far behind many East Asian economies in terms of growth.

In economic literature, differences in growth had been explained to a large extent by differences in the rate of savings which also determine a country's investment in productive capacity, developing human capital and improving socio-economic infrastructure.

In Figure 1, we provide data on national savings rate, private savings rate and public savings rate. It can be seen that private savings constitute almost 90% of the national savings. On the other hand, public savings share in national savings had been negligible. Vincelette (2006) also noted that private savings accounts for 90% of the total savings in Pakistan in the period 1981-2005.

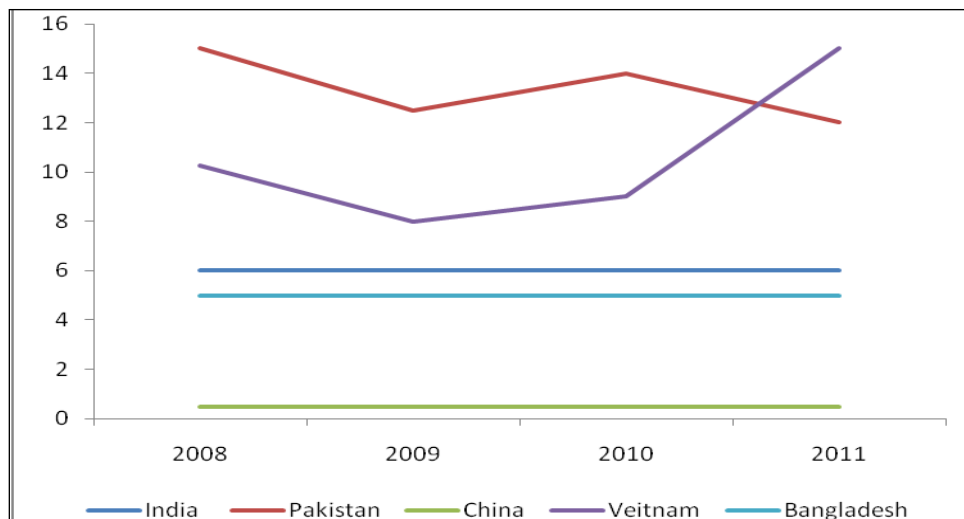
**Figure 1: National Savings, Private Savings & Public Savings Rate (in proportion)**



**Source: Handbook of Statistics on Pakistan Economy**

The interest rates are higher in Pakistan than in the other regional countries. Figure 2 shows the comparison of discount rates set by central banks of regional countries. Pakistan has set the highest discount rate in the region for most time periods. Despite that, Pakistan had not been able to control inflation effectively as it was driven mainly by exogenous supply side shocks.

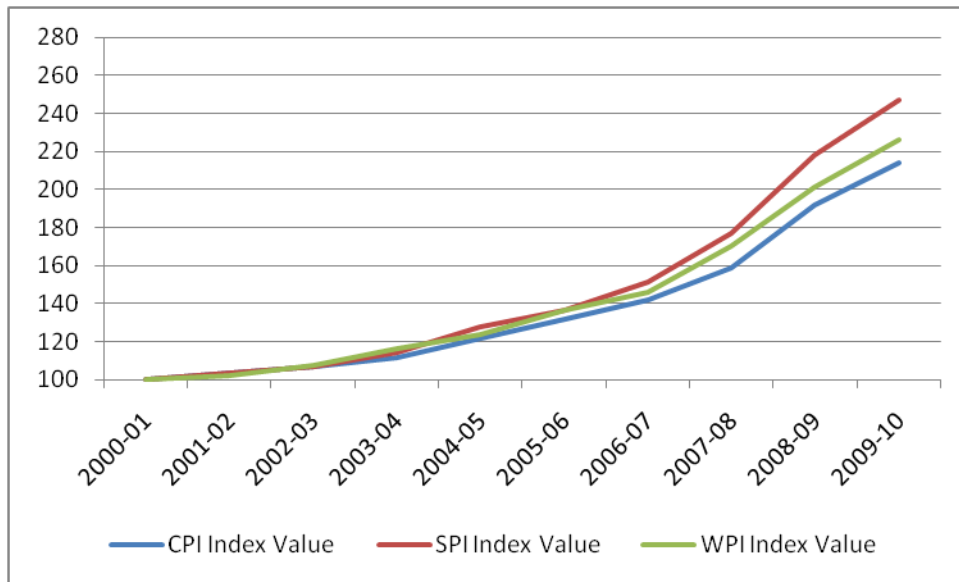
**Figure 2: Discount Rate in Regions (%)**



**Source: IMF**

Figure 3 shows that despite the high discount rate set for quite some time, inflation has surged and remained high during the last decade.

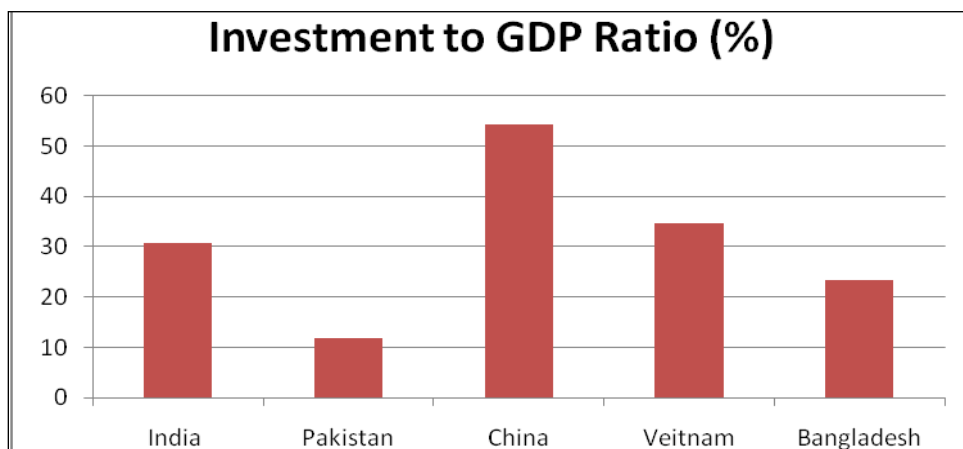
**Figure 3: CPI Inflation Rate (%)**



Source: State Bank of Pakistan

Pakistan has one of the lowest investments to GDP ratio in the world. Figure 4 provides a comparison of investment to GDP ratio in Pakistan as compared to the regional countries. One of the prime reasons of low investment to GDP ratio include the high cost of doing business which includes i) high taxes in the formal sector, ii) supply side bottlenecks, iii) weak security, iv) weak legal system & enforcement etc.

**Figure 4: Investment to GDP Ratio (%)**

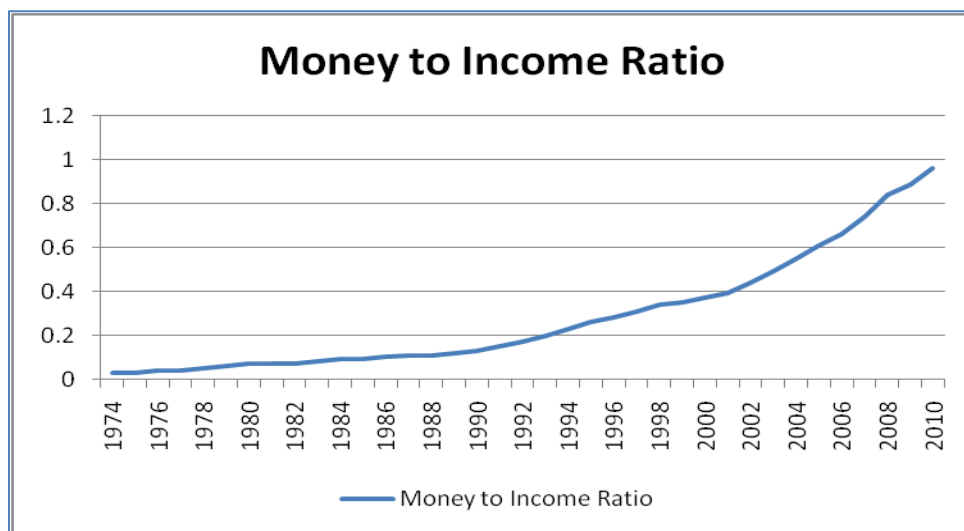


Source: CIA Factbook

In last 20 years, private savings rate increased marginally and especially during the 2003-07 boom because of financial sector deregulation and introduction of various financial institutions which deepened the financial market.

Figure 5 plots money supply to GDP ratio over the last 37 years period (1974-2010). The ratio is a proxy used in literature (Hussain, 1995) for financial deepening and it can be seen that the ratio has an increasing trend in Pakistan which may have partly contributed to the higher savings rate in patches after the introduction of financial liberalization and deregulation since 90s.

**Figure 5: Money Supply to GDP Ratio**



**Source: Handbook of Statistics on Pakistan Economy**

Beyond savings in bank schemes, there is increased interest in direct investment in capital markets especially stocks and also indirectly through various types of mutual funds and in annuities offered by insurance companies.

## 2. Brief Literature Review

First, we give a brief account of studies that have taken primary data to analyze the consumption and savings behavior at the micro and household level. Since consumption data in Pakistan is only calculated through a residual approach, the micro data analysis provides more useful insights and foundation.

In an empirical study taking primary data through a structured questionnaire, Abid & Afridi (2010) found that rural areas have more savings ratio as compared to urban areas. It is possibly due to the fact that remittances received by rural households in the sample were taken as transitory income and was mostly saved.

Quite possibly, expenditure on education and health is lower in rural areas and furthermore, they are able to afford food supplies at much lesser cost as compared to urban households and they are able to save more as a result. It is also plausible that due to dependence on agriculture and weather conditions, people in rural areas have a tendency to save for the precautionary motive.

In the study by Abid & Afridi (2010), it was found that family size is inversely related to saving. One plausible explanation is that people in large family size and especially with increased number of non-working age family members and non-participating women tend to have lesser

savings. In a study by Farhan (2011), age-dependency ratio also had inverse relationship with savings in the long run.

Abid & Afridi (2010) also established that savings is inversely related with education. It maybe a characteristic of the sample being chosen. One of the possible explanations could be that people who have just completed their higher education tend to start careers at nominal salaries and most have already accumulated debt from private sector education. Also, people with more education tend to spend relatively more on education of siblings/children, health and quality food supplies. Their formal sector employment may necessitate tax deduction at source which may decrease their disposable income and hence savings. Rehman et al. (2010) also found that Marginal propensity to save for job holders is lower than labor class savings due to more consumption habit in the former group.

However, at macro level, a study by Vincelette (2006) discovered that demographic changes, captured by urban migration have a positive influence over national savings rate on average at the macro level. Possible explanation of this result could be that richer households in urban localities have more saving opportunities in urban localities and increased awareness about financial planning, consumption smoothing and its advantages.

Rehman et al. (2010) through a sample based micro-econometric study in Multan concluded that spouse participation, total dependency rate, total income of household and size of landholdings significantly raise household savings. Education of household head, children's educational expenditures, family size, liabilities to be paid, marital status, and value of house significantly reduce savings level of households.

The study also found empirical evidence in support of life cycle hypothesis by Ando & Modigliani (1963). It is established by including both household's head age and square of household's head age in the model. Age variable has positive relationship with savings and square of age has negative relationship with savings. This indicates that age versus savings is a concave up function. However, this goes against the observation that people save for their children in our society. However, it can be reconciled by noting that usually people leave behind tangible assets or property and usually distribute the holdings mostly in their lifetimes.

In the study, it was established that female participation in labor force had the highest positive nominal effect on savings. This shows that income earned by female household is mostly regarded as transitory income and hence, it is mostly saved as explained by the large value of the coefficient.

Next, we list the studies that have taken macro data to analyze savings and consumption in Pakistan and identify the various determinants and factors influencing consumption and savings.

Chaudhry et al. (2010) concluded positive relationship of savings with exports as a proportion of GDP, remittances, inflation as measured by CPI, interest rate and government consumption. In their study, public loans in the long run had a negative relationship with savings.

Hussain (1995) noted that increased savings in post 1970 era were majorly influenced by financial deepening. He measured financial deepening as the ratio of money stock divided by total aggregate income.

The study by Nasir & Khalid (2004) estimated savings function for Pakistan economy and found that fiscal deficit has a negative influence on savings while real interest rate had a positive influence on savings. The positive relationship between real interest rate and savings signify that the substitution effect is greater than the income effect. Remittances are also found to be positively associated with savings which is consistent with other studies.

### 3. Research Methodology

In this study, we test three famous consumption models in the literature for their empirical verification taking macro level data for Pakistan economy. These include Keynes (1935) consumption function, Robert Hall's (1978) Random Walk Hypothesis and Milton Friedman's (1957) Permanent Income Hypothesis.

Secondly, two multiple regression models are run using Ordinary Least Squares (OLS) approach to study the determinants of savings in Pakistan economy.

### 4. Empirical Analysis of Various Consumption Models

#### 4.1. Keynes Consumption Model

Keynes (1935) postulated that consumption is a function of income and that marginal propensity to consume is positive but less than 1. His model can be expressed mathematically as:

$$C = \beta_0 + \beta_1 Y + \mu$$

Where,

C = Aggregate Real Consumption in million PKR.

Y = Aggregate Real Income in million PKR.

$\mu$  = Random error term.

$\beta_0, \beta_1$  are parameters of the model.

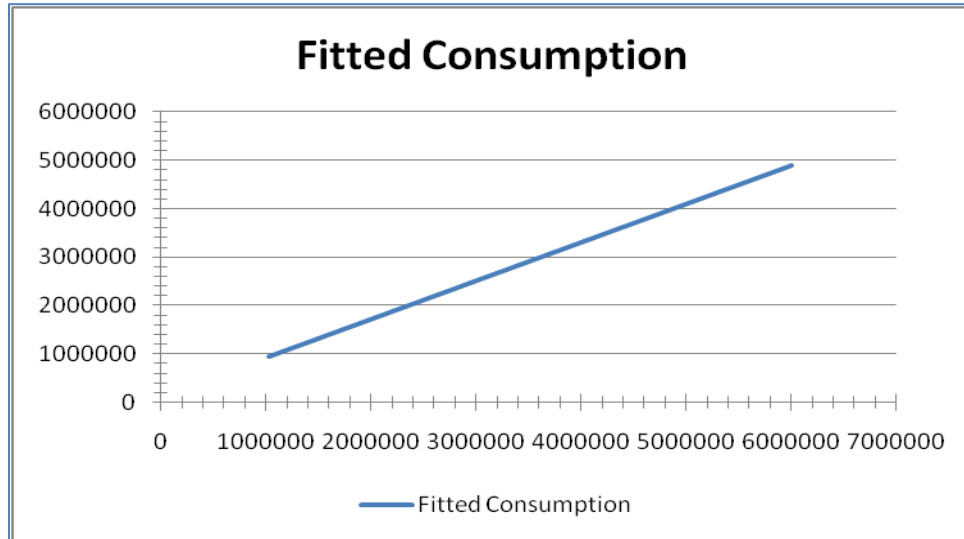
As per Keynes (1935), MPC ( $\beta_1$ ) is positive but less than 1. As a result, Average Propensity to Consume (APC) would fall with successive increase in income. In Table 1, we provide estimate of this conjecture.

Table 1: Empirical Results of OLS from Keynes Model

Source	SS	df	MS	Number of obs = 37		
Model	4.9564e+13	1	4.9564e+13	F( 1, 35) =	13100.42	
Residual	1.3242e+11	35	3.7834e+09	Prob > F =	0.0000	
Total	4.9697e+13	36	1.3805e+12	R-squared =	0.9973	
				Adj R-squared =	0.9973	
				Root MSE =	61509	
c	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
rgdp	.7913585	.006914	114.46	0.000	.7773223	.8053948
_cons	138022.9	23038.84	5.99	0.000	91251.56	184794.2

It can be seen that MPC is computed to be 0.79 which means estimated MPS is 0.21. In Figure 6, we plot the fitted values of the model.

Figure 6: Fitted Values of Consumption from Keynes Model



#### 4.2. Hall's Random Walk Hypothesis

Hall (1978) argued that consumption is a random walk and hence it is not determinable through income. Income changes cannot determine changes in consumption. As per his hypothesis, consumption function is given by:

$$C_t = \beta_0 + \beta_1 C_{t-1} + \mu$$

Where, Hall (1978) hypothesized that  $\beta_0=0$  and  $\beta_1=1$

$$C_t = C_{t-1} + \mu$$

Where,

$C_t$  = Aggregate Real Consumption in time period t.

$C_{t-1}$  = Aggregate Real Consumption in time period t-1.

$\mu$  = Random error term

In Table 2, we provide estimate of this conjecture. As per the hypothesis, the coefficient is near one and the intercept is a small proportion of average income, i.e. less than 2% and is statistically insignificant. In Figure 7, we plot the fitted values of the model.



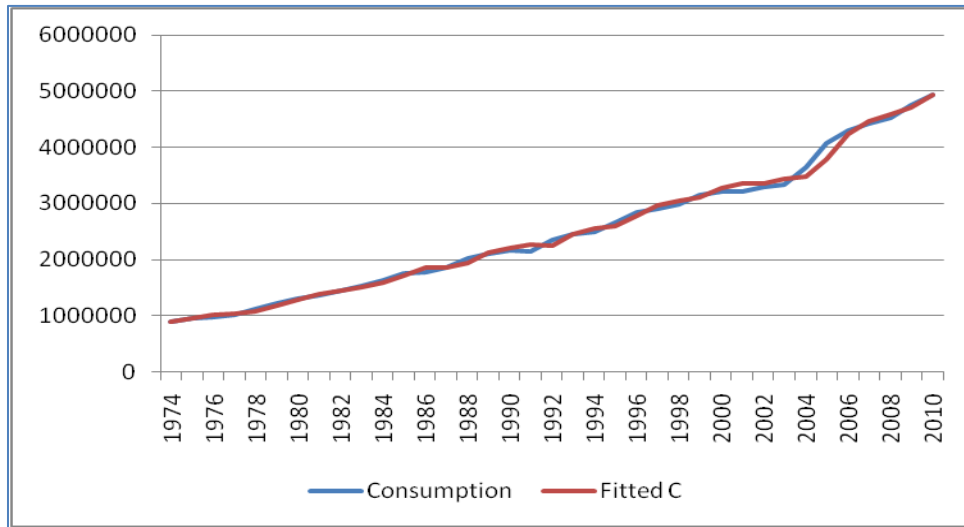
Table 2: Empirical Results of OLS from Hall's RWH Model

Source	SS	df	MS			
Model	4.9473e+13	1	4.9473e+13	Number of obs =	37	
Residual	2.2381e+11	35	6.3947e+09	F( 1, 35) =	7736.61	
				Prob > F =	0.0000	
				R-squared =	0.9955	
				Adj R-squared =	0.9954	
Total	4.9697e+13	36	1.3805e+12	Root MSE =	79967	

c	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
_l	1.034811	.0117648	87.96	0.000	1.010928	1.058695
_cons	27438.14	31109.17	0.88	0.384	-35716.84	90593.12

Figure 7: Fitted Values of Consumption from Hall's RWH Model



#### 4.3. Friedman's Permanent Income Hypothesis

Friedman (1957) argued that consumption is a function of permanent income.

$$C = cY_p + \mu$$

Where,

C = Aggregate Real Consumption.

$Y_p$  = Permanent Income. It is measured by taking 3 year moving average of aggregate income.

$\mu$  = Random error term.

He argued that APC would not fall and consumption would be smooth. To estimate his model for Pakistan economy, we need data on permanent income. In line with literature, we take 3 year moving average of aggregate income as a proxy for permanent income. In Table 3, we provide estimate of permanent income hypothesis.

**Table 3: Empirical Results of OLS from Friedman's PIH Model**

Source	SS	df	MS	Number of obs = 37		
Model	2.8196e+14	1	2.8196e+14	F( 1, 36)	=	27994.37
Residual	3.6259e+11	36	1.0072e+10	Prob > F	=	0.0000
Total	2.8232e+14	37	7.6302e+12	R-squared	=	0.9987
				Adj R-squared	=	0.9987
				Root MSE	=	1.0e+05

c	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
pi	.8656809	.005174	167.32	0.000	.8551876 .8761742

In Figure 8, we plot APC computed from Keynes (1935) model and that calculated from Friedman's (1957) model. It can be seen that both are almost constant over the period of time in the long run. This is evidence in favor of consumption smoothing in the long run.

**Figure 8: APC from Keynes and Friedman's Model**

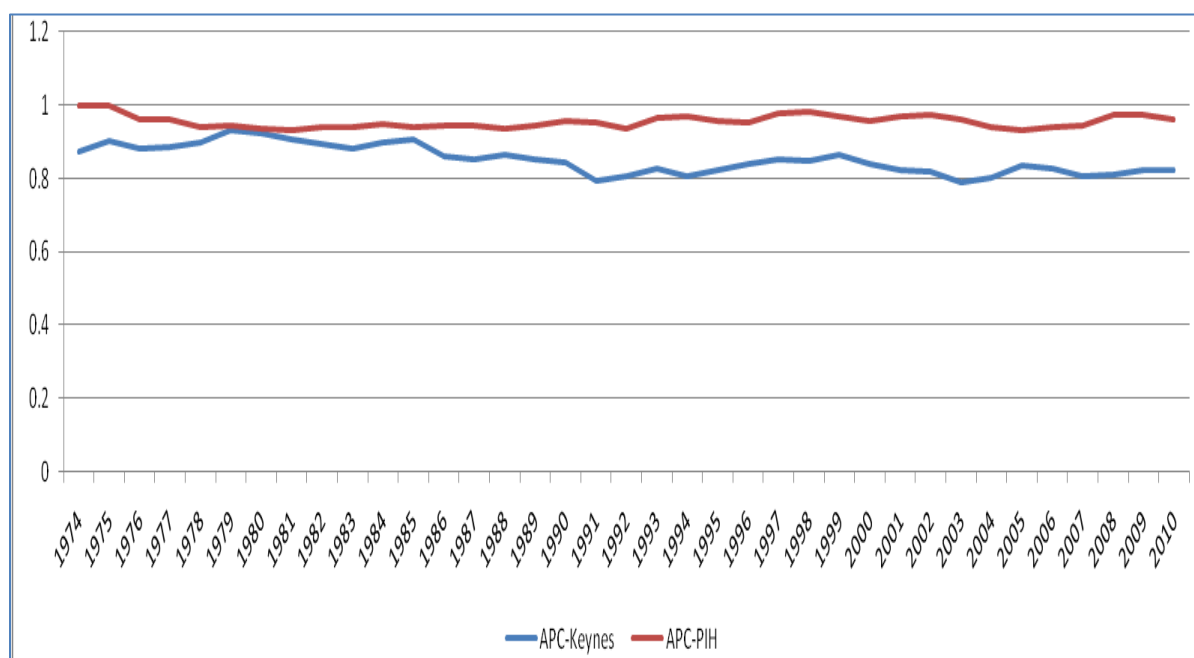


Table 4 gives descriptive statistics of real consumption and real GDP both in levels and in growth. Lower standard deviation of consumption in levels is another indication of consumption smoothing. However, consumption growth is more volatile than real GDP growth rate.

Table 4: Descriptive Statistics of Real Consumption and Real GDP

Variable	Obs	Mean	Std. Dev.	Min	Max
c	37	2507404	1174932	901121	4929157
rgdp	37	2994068	1482723	1030033	6004405
cgr	37	.0476927	.0310026	-.0091038	.1167682
rgdpgr	37	.0502649	.0195669	.0101	.0853

## 5. Determinants of Savings

### 5.1. Model 1

To estimate determinants of savings, we estimate the following model. Table 5 reports the results.

$$NS = \beta_0 + \beta_1gdp + \beta_2mcap + \beta_3fdebt + \beta_4ge + \beta_5x + \beta_6rempk + \beta_7cpi + \mu$$

Where

NS = Aggregate National Savings in million PKR.

gdp = GDP in million PKR.

mcap = Market Capitalization in million PKR.

fdebt = Federal Debt in million PKR.

ge = Government Expenditure in million PKR.

x = Real Exports in million PKR.

rempk = Remittances in million PKR.

cpi = Inflation growth rate.

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$  are the parameters of the model.

$\mu$  = Random error term.

Table 5: Empirical Results for Determinants of Savings (Model 1)

Source	SS	df	MS	Number of obs = 35		
Model	6.8512e+12	7	9.7874e+11	F( 7, 27) =	525.92	
Residual	5.0247e+10	27	1.8610e+09	Prob > F =	0.0000	
Total	6.9014e+12	34	2.0298e+11	R-squared =	0.9927	
				Adj R-squared =	0.9908	
				Root MSE =	43139	

ns	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gdp	.443017	.0623887	7.10	0.000	.315006	.5710281
mcap	-.1182655	.0345501	-3.42	0.002	-.1891565	-.0473745
fdebt	-.4012022	.0780552	-5.14	0.000	-.5613583	-.2410461
ge	-.7024815	.1428225	-4.92	0.000	-.995529	-.409434
x	.6890271	.1080168	6.38	0.000	.4673949	.9106592
rempk	-1.075013	.4499726	-2.39	0.024	-1.998281	-.1517455
cpi	-458749.2	153895.5	-2.98	0.006	-774516.8	-142981.7
_cons	44157.86	32564.96	1.36	0.186	-22659.92	110975.6

### 5.1.1. Results & Data Analysis

It can be seen that all variables are statistically significant at 5% level of significance. Model is overall significant as well with adjusted  $R^2 = 0.99$ . The signs of the coefficients are also in line with theory and expectation. GDP and exports have a positive impact on savings. Increase in wealth is expected to have a negative impact on savings and hence savings is negatively associated with market capitalization and remittances.

Furthermore, increase in government expenditure and federal debt has negative influence on savings and this too is in line with theory. Finally, inflation growth has a negative impact on savings and it is plausible since increase in inflation erodes value of savings and hence people tend to consume more especially if they expect the future trend of price level to be high. In empirical studies, it had been established that people in Pakistan have adaptive expectations with regards to inflation and this increases their consumption demand in present time period if they expect rising inflation to persist.

### 5.2. Model 2

To estimate determinants of savings, we estimate the following model. Table 7 reports the results.

$$SR = \beta_0 + \beta_1rgdpgr + \beta_2xgdpr + \beta_3remgr + \beta_4cpi + \mu$$

Where

SR = National Savings Rate.

rgdpgr = Real GDP Growth Rate.

xgdpr = Export to GDP Ratio.

remgr = Remittances Growth Rate.

cpi = Inflation growth rate.

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$  are the parameters of the model.

$\mu$  = Random error term

Table 7: Empirical Results for Determinants of Savings (Model 2)

Source	SS	df	MS	Number of obs = 37		
Model	.026775045	4	.006693761	F( 4, 32) =	57.68	
Residual	.003713878	32	.000116059	Prob > F =	0.0000	
Total	.030488923	36	.000846915	R-squared =	0.8782	
				Adj R-squared =	0.8630	
				Root MSE =	.01077	
sr	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
rgdpgr	.4493807	.0978248	4.59	0.000	.2501181	.6486433
xgdpr	.5826103	.0668805	8.71	0.000	.4463792	.7188413
remgr	.022005	.005774	3.81	0.001	.0102437	.0337663
cpi	-.3161571	.0318557	-9.92	0.000	-.3810451	-.2512691
_cons	.0660436	.0129567	5.10	0.000	.0396516	.0924356

### 5.2.1. Results & Data Analysis

It can be seen that all variables are statistically significant at 5% level of significance. Model is overall significant as well with adjusted  $R^2 = 0.8630$ . The signs of the coefficients are also in line with theory and expectation. Real GDP growth rate and exports to GDP ratio have a positive impact on national savings rate. This shows that both consumption and savings are normal goods and positively associated with income.

Increase in remittances growth is positively influencing national savings rate. Increase in remittances growth if taken as increase in transitory income, then, we see that increase in remittances will mostly be saved as per permanent income hypothesis.

Finally, inflation growth has a negative impact on national savings rate because increase in inflation dampens the real return on savings. People with adaptive expectations of higher price level in future would tend to increase their consumption demand in present time period.

### Conclusion & Recommendations

In this study, we tested three famous consumption models in the literature for their empirical verification taking macro level data for Pakistan economy. These include Keynes (1935) consumption function, Robert Hall's (1978) Random Walk Hypothesis and Milton Friedman's (1957) Permanent Income Hypothesis. The results indicate evidence of consumption smoothing and relatively stable Average Propensity to Consume (APC) in the long run. In the second set of models for analyzing determinants of saving, we found that savings are positively related with aggregate level of income and exports while negatively related with total market capitalization of stocks, federal debt, government expenditure and inflation. To boost savings in the economy and achieve sustainable growth, we recommend the following:

- i) Reducing cost push inflation through investment in renewable energy so that real returns on savings increase and people can plan and invest for long term.
- ii) Tax base needs to be increased through documentation. Income tax should be levied on agricultural income and capital gains from stock trade and real estate investment. Services especially the hotels/restaurants, franchises etc must be brought in tax net rather than looking to burden the already registered taxpayers and small number of savers.
- iii) Furthermore, banking spreads are at an all time high in Pakistan. Banks should be compelled to open branches in rural areas so that saving culture develops in masses.
- iv) Providing incentives for producers to incorporate their businesses in formal sector, raise capital through issuing financial securities to the general public so that people have alternative direct investment opportunities that offer them better yields on savings. This will also compel banks to offer financing at lower rates so that they do not lose lending business to direct issuance of financial securities by firms. It will also compel banks to offer better yields so that people do not substitute bank investment with holding corporate financial securities. This will help in reducing the banking spread. Incentives in this regard could be tax exemption or reduction on savings and allowing fast amortization of loans in financial accounts for tax purposes by firms.
- v) Increase in investment through the above mentioned measures will help reduce market imperfections and concentration and hence increased competitiveness will help reduce

market prices, curb monopolistic practices and keep inflation in check so that real returns are not hurt.

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