RELATIONSHIP BETWEEN INTEREST RATE AND HOUSEHOLD'S SAVINGS IN PAKISTAN

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ABSTRACT: The present study is undertaken to examine the impact of interest rate, inflation rate and per capita income on household's saving in Pakistan for the period of 1981 to 2011. The study uses simple descriptive statistics to analyze the trend in household's saving. It also uses advance techniques of time series econometrics for modeling the household's saving function. It includes Granger causality test (Block erogeneity test), Johanson Co-integration, and general to specific methodology for modeling the appropriate Vector Error correction model. The applications of the techniques are based on the order of integration of time series data. It is, therefore, the reason that Augmented – Dickey Fuller test has been carried out for testing the order of integration of the time series variables, and thereby, selecting the estimation techniques for estimating parameters of the model. The careful inspection of the data reveals that all the variables are non-stationary at level, stationary at their first difference. Based on this characteristic of the data Johnson co-integration technique has been used for estimation, rather than simple OLS which is biased at the present case. The empirical results show that there exist equilibrium in long run relationship among per capita income, inflation, interest rate and household's saving. There is also significant error correction component which reveals that system reverts to its long run equilibrium in response to external shocks. These results are as per economic theory. On the basis of empirical evidence, it is suggested that inflation rate may be kept low so that real interest rate may be stimulated for accelerating rate of household's saving rate.

KEYWORDS: Economy, Interest rate, per capita, income, household, saving, Pakistan.

1 INTRODUCTION

Saving is the difference between income and consumption. It is the postponement of current consumption for future consumption instead of or it is the substitution of current consumption for having more bundles of goods in future. Saving and consumption are the two sides of the same coin. The decision to save and consume are inter-related, and there are a number of factors which may influence individual's preference for saving and spending. These factors include interest rate or rate of return on saving, inflation rate, spending habits of a society etc. National saving is the amount of money which is not spends by a nation or country. It is the difference between national income of a country minus its consumption on various goods and services. National income of a county can be calculated by different ways such as national income at current market prices, constant market prices or base year prices and factor cost. The concept of national saving can also vary accordingly, for instance national saving at market prices would be obtained or nominal national saving is resulted. Similarly, real national saving or national saving at constant prices is the amount obtained after deducting aggregate consumption from national income at base year prices, (Bishop & Cassidy, 2012). National saving has three main components such as household saving, corporate saving and government saving. Household saving is the aggregate amount which is saved done by all households in a county or it is the summation of savings of all households in a country. It is obtained by deducting household consumption from after tax household income or it is the difference of household disposable income and it's spending on various durable and non-durable goods and services. The household disposable income is the difference of personal income from all sources and direct taxes or income taxes. Household's spending is the expenditure of a household for the purpose of obtaining direct satisfaction or utility. Household saving is the aggregate amount of income which is not spent by all

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households in a country, (Bishop & Cassidy, 2012). Corporate saving is the second important component of a national saving. It is the amount of after tax profit which is not distributed among shareholders. The concept of after tax profit can be defined as the amount of gross profit of a corporation minus corporate income tax. Like individual income tax, there are corporate income taxes which are imposed on the income or profit of corporation as its name indicates. It is very important for a corporation to keep aside amount of profit as saving so that it can be used when it is highly needed. It reduces corporation dependence on market or bank for financing her investment needs. It, therefore, reduces its elasticity of demand for loan in various business environments, (Bishop & Cassidy, 2012). Pakistan's saving rate is not very impressive. It has been classified among those countries which are characterized by low saving rate. The highest saving rate of 21.3 percent in 1972 is lower than the regional countries with similar income and social structure, (State Bank of Pakistan , 2007-08). There are a number of factors which are probably considered to be the main determinants of low saving rate in Pakistan. On the basis of economic theories, these factors include economic growth, demographic structure, fiscal stance of the government, real rate of return, expected inflation rate, state of financial sector, cultural and psychological issues etc, (State Bank of Pakistan , 2006). Saving rate is also dependent on real rate of return on deposits which depends on nominal interest rate, inflation rate and expected inflation rate. If nominal interest is higher than the inflation rate, and if it is expected that inflation rate would be consistently lower than nominal interest rate, then saving would increases because real rate of return on deposit would be positive and net household's wealth would grow in future. Similarly, there are cultural and psychological factors which may also affect saving of a country, such as, consumption habits. If society is consumption oriented i.e. if society prefers to spend lavishly may be either due to lack of foresight or lack of vision, then saving rate is expected to be lower.

STATEMENT OF THE PROBLEM

National saving plays vital role in economic growth and development of a county. It is the supply of funds for investment projects of a country. If there is regular supply of loan available for investors, there would be smooth business operations and hence would result in expansion of productive capacity of an economy. If there is expansion of productivity at higher sustained rate. With opening of new and new employment opportunities of a country, unemployed labor would be absorbed in production process and thereby increase the overall productivity of inputs. As standard of living directly depends on rate of expansion of national economy, therefore, national economy would share the aggregate prosperity among the neglected and marginalized segment of the society. The long run impact of high sustained saving rate can be viewed as lower poverty, abundant facilities of health and education which result in even more productive human resources in future, high growth with low unemployment and massive incentive for research and development, technical spillover and higher standard of living. Household's saving constitute a single larger component of national saving of Pakistan. Fluctuations in household saving can greatly affect the performance of national economy through ups and downs in availability of national saving for investment in the country. In other words, household saving is the largest component of national saving which can cause business cycle with significant fluctuations in planned investment in Pakistan. In this context, the determinants of household's saving are vital to investigate in the Pakistan or in other words, it is very urgent to know the leading factors which can fluctuate the household saving at macroeconomic level. The response of household's saving to various macroeconomic environments in both short run and long run is crucial to be known to policy makers in order to prepare policy packages for smooth uplift of national economy. There are a number of studies which are related to the determinants of national savings and its link to investment and economic growth in various settings; however, the studies related to analyses of factors which can cause considerable fluctuation in household's saving are not properly analyzed using longer time series data with standard macro-econometric models. This study is an attempt to investigate the short and long run response of household saving to the leading factors in Pakistan and a constitute useful investigation in the light of its importance for national economy.

OBJECTIVES OF THE STUDY

- To analyze pattern of household's savings in Pakistan, over a long period of time.
- To assess the role of interest rate in determination of level of household's savings in Pakistan

2   REVIEW OF LITERATURE

Summer (1982) estimated the interest elasticity of saving that depends on the life-cycle hypothesis from a consumption function incorporating data on the after-tax real rate of interest. It shows a positive relationship between saving and interest rate. Ali (1985) extends his earlier study to estimate income and price elasticities of household's consumption and saving for Pakistan using Extended linear Expenditure system approach. He extends sample from 1979 household's income and expenditure survey. He quantifies the consumer responsiveness to the change in income and relative commodity prices using

single equation model. He estimates one demand equation at a time. This approach has a numbers of advantages, but its major shortcoming lies in the difficulty and of driving consistent estimates of parameters because he ignores the problem of interdependence among different goods. The empirical results can be used for studying polices effects at micro level. Khatkhate (1988) divides developing countries in three groups, depending on whether they had positive real interest rate, moderately negative real interest rate and strongly negative real interest rate. He estimates the response of saving rate to these types of interest rates and concludes that saving rate is high for positive real interest countries vice versa. Kazmi (1990) examines the causes of low saving rate in Pakistan compared with the persistently rising rates in the regional countries. The factors of low saving rate are the outcomes of many economic, demographic, political, social, cultural and religious factors. In which some factors are quantitative and other are qualitative. However socio-political and religious factors are basically the leading factors responsible for low saving rate in Pakistan. Burney & khan (1992) test the hypothesis of low saving in Pakistan for last two decades. They argue that there are many factors behind it. These include socioeconomic and administrative factors, which are responsible for it. High propensity to consume due to introduction of new products in the market that is also a major factor for low saving in the economy. These factors slow down the saving rate in economy. Empirical results show that saving depend on it dependency ratio, education, employment, opportunities, earning status of the household, profession, residential factor and secondary earning sources. Lavoto (1992) analyses the impact of the interest rate on the saving rate in the developing countries. He also compares the interest elasticity of saving in the United States with the developed countries. Wealth effect outweigh in importance with the elasticity of substitution between present and future consumption. Study reveals that interest elasticity of savings is high and the value of substitution's elasticity is slow. Siddiqui & Siddiqui (1993) argue that household's saving is vital for economic for progress and prosperity. In his study, they discuses that in 1960-90 rate of the household's saving in the total national saving is about 83 percent and the Gross domestic product is about 6.6 percent to 10 percent. This is the highest rate of household's saving that emerged in the history of Pakistan. Empirical results indicate that there are many factors, which are responsible for it. Firstly, capital formation helps in increasing labor productivity and future's income. Secondly, changes in the economic and demographic factors also increase the household's saving more rapidly than consumption. Smyth (1993) implies that there are economic factor that motivate household's saving. On the one hand, future demands for credit can motivate household's savings but on the other hand, supply of saving also creates demand for credit. The study is carry out in the rural area of Nakuru District The choice of a rural region as area of study is based on the fact that a majority of the household's live in the rural areas, and hence the investment demand for loan will contribute to the increase household saving as well as growth and development agricultural sector. The research study analyzed savings behavior among is monetary savings among farmers, entrepreneurs and teachers whose members live in the rural areas of Nakuru District over the period of November 2005 to May 2006. Azam et al (2010) examine relationship between saving and investment which is important for the socioeconomic development of the country via capital accumulation. The study shows that during 1970-2009 there has been downward trend in household saving for many developing countries. The empirical finding of study reflects that there is a positive impact of the per-capita income on the national saving and there is negative impact of inflation. The conclusion of the study is simple that there may be increase in the level of the per-capita which can increase household saving and can accelerate economic. They also discuses that unemployment, increase in the population growth, decrease in the economic growth and other supply shocks especially in food and energy supply also slow down the saving rate in Pakistan.

PROFILE OF PAKISTAN'S ECONOMY

Pakistan came into existence at 14th August of 1947. It is situated in South Asia. Its neighboring countries include India, Iran, Tajikistan, Afghanistan, and China. Pakistan is a developing country and one of the 27th largest economy in the world[1] (Economy Watch, 2010). The value of Pakistan's GDP based on purchasing power parity (PPP), is $488.4 billion in fiscal year 2011 as compared to $474 billion and $459.9 billion in fiscal year of 2010 and 2009 respectively[2]. Real growth rate of GDP is 3 percent in fiscal year 2011, whereas, it recorded as 3.1 percent and 1.7 percent in the fiscal year of 2010 and 2009 respectively (Central Intelligence Agency - CIA , 2012). Pakistan is dependent on agriculture sector[3] which accounts for more than one fifth of output and two – fifths of employment level (Central Intelligence Agency - CIA , 2012). It contributes 21

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[1] It is on the basis of Purchasing power parity (PPP).

[2] Estimates are in US dollars

[3] Manufacturing is the third largest sector in Pakistan's economy. It accounts 18.5 percent to GDP and 13 percent to total employment. Large Scale Manufacturing dominates the whole industrial sector. It contributes to GDP by 12.2 percent and contains 66 percent of total sectoral share (Ministry of Finance, 2009-10).

percent to GDP and generates productive employment opportunities for 45 percent of country's labor force. Almost, 60 percent of the rural population depends for their livelihood on agriculture sector, (Ministry of Finance, 2011-12; p-17). Table No.1 Shows a brief sketch of behaviors of leading macro-economic variables in Pakistan, namely GDP, agriculture, manufacturing, commodity producing sector, services sector, national saving and percentage change in consumer price index (CPI). Average annual growth rates in 1960s to 2000s are reported. The behavior of Gross Domestic Product (GDP) is volatile. GDP growth rate in 1960s is 6.8 percent, and falls to 4.8 percent in 1970s. It makes it minus two percent fall during 1970s. GDP growth recovers to 6.5 percent in 1980s; however, it falls back to 4.6 percent in 1990s. There has been only 0.7 percent rise in growth during 2000s as compared to 1990s. There are several factors which may be considered as pulling factors of GDP growth such as war with India during 1960s, again there had been tensions in East Pakistan during 1970s, and even East Pakistan got a status of an independent state as a Bangladesh. There are policies of nationalization and privatization in 1980s and 1990s coupled with Afghan war in 1980s. Recent war on terror which started in 2001 and continue till date also suffered Pakistan economy a lot.

Table No. 3.1: Growth Rates of Leading Macro-Economic Indicators of Pakistan
(Annual average at constant factor cost in percent)

Indicators/Time	1960s	1970s	1980s	1990s	2000s
GDP	6.8	4.8	6.5	4.6	4.7
Agriculture	5.1	2.4	5.4	4.4	3.2
Manufacturing	9.9	5.5	8.2	4.8	7.1
Commodity producing sector	6.8	3.9	6.5	4.6	4.3
Services sector	6.7	6.3	6.7	4.6	4.3
Unemployment Rate	…..	…..	1.4	5.7	6.8
National savings at Market prices	…	11.2	14.8	13.8	15.8
CPI (percent)	3.2	12.5	7.2	9.7	7.3

Source: Economic Survey of Pakistan (2012-13)

Like GDP growth rates, growth of agriculture, manufacturing and services sectors also show the similar pattern over 1960s to 2000s. The growth of agriculture, manufacturing, and services sectors is 5.1 percent, 9.9 percent and 6.7 percent in 1960s respectively. Similarly, with the falls in GPD growth in 1970s, there had been significant downsizing in above three sectors with 2.4 percent for agriculture, 5.5 percent for manufacturing, and 6.3 percent for services sector. National saving has important implication for growth and development in Pakistan (see Table No3.1). The growth rate of national saving has been 11.2 percent in 1970s, increases to 14.8 percent in 1980s. It falls to 13.8 percent in 1990s and rises to 15.8 percent in 2000s. The growth rate of GDP has been closely related with the growth rate of national savings. GDP growth rate has been lower when growth of national savings has been decreased and vice versa (See Figure No 3.1). The relationship between national saving and CPI inflation is also shown in the Figure No 3.1. It is evident that inflation rate inversely affect growth of national savings. If inflation rate is high, the growth rate of national saving has been low. It may be due to the channel of real rate of return on deposits. Economic theory predicts that if inflation rate is higher than the nominal market interest rate, there would be negative rate of return on saving, therefore, national saving falls.
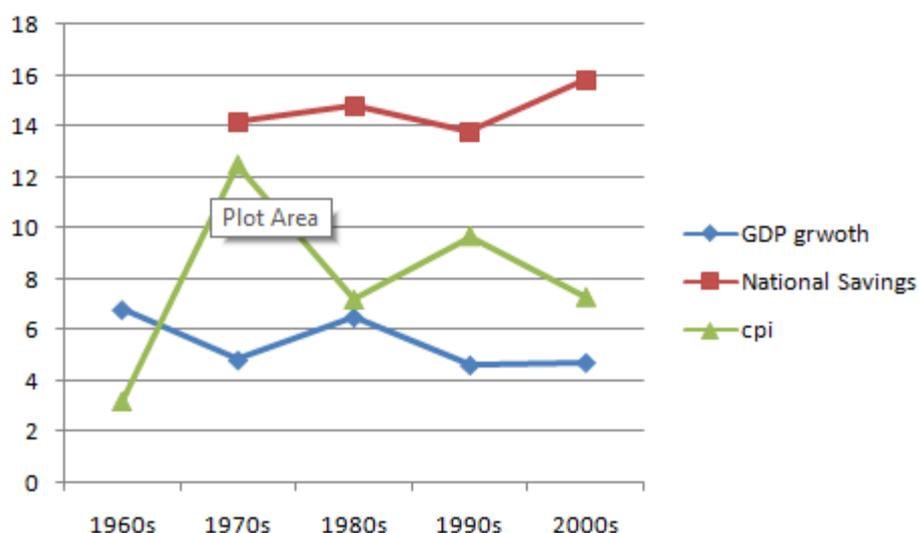
Figure No 3.1: GDP growth at constant market prices, growth of National saving at current market prices and CPI inflation rate.

Source: Table No 3.1

The present dynamics of Pakistan's economy reveals that it is tripped into low growth – high inflation and unemployment zone. It is due to the reason that efforts for poverty reduction and enhancement of living of standard have not been remained fully profitable. Increasing food prices coupled with overall double digit inflation, the level of poverty increased to 50 percent of the total population in FY11, (Central Intelligence Agency - CIA , 2012).

GDP growth is the key yardstick to judge expansion of productivity among the countries with the similar condition of social and economic set-ups. GDP growth rate of Pakistan is under pressure from 2005 to 2011 comparing it with its similar counter parts, (See Table No.3.2). For instance, Pakistan's GDP growth rate has been continuously falling from 9 percent in 2005 to 2.4 percent in 2011 with a little improvement in 2010. On the other hand, real GDP growth rate of China has been continuously increasing from 11.3 percent in 2005 to 14.2 percent in 2007. There has been a little pressure on china's real GDP growth from 2008 till 2011; however, overall performance is outstanding in the region even in spite of recent financial crises. Figure No 3.2 presents a sketch of growth rates of some of the regional countries on the basis of the data in Table No 3.2. The average growth rate of Chinese economy is 10.97 percent during 2005 to 2011, followed by 8.48 for Indian economy, and 6.45 percent for Sri Lanka. The last seven years average of growth rate for Bangladesh is 6.24 percent, while it is only 4.74 percent for Pakistan. Pakistan stands at last among china, India, Sri Lanka and Bangladesh in the growth performance of the national economy. It means that Pakistan's economy is very sensitive to global economic development than the other countries just mentioned above. This high sensitivity of national economy to global economic performance is the key parameter of business cycles in Pakistan.

Table No 3.2: Regional Comparison in Real GDP Growth Rates (Percent)

Year	China	India	Sri Lanka	Bangladesh	Pakistan
2005	11.3	9.0	6.2	6.3	9.0
2006	12.7	9.5	7.7	6.5	5.8
2007	14.2	10.0	6.8	6.3	6.8
2008	9.6	6.2	6.0	6.0	3.7
2009	9.2	6.8	3.5	5.9	1.7
2010	10.3	10.1	8.0	6.4	3.8
2011	9.5	7.8	7.0	6.3	2.4

Source: Annual Report (2011, P -1), State Bank of Pakistan
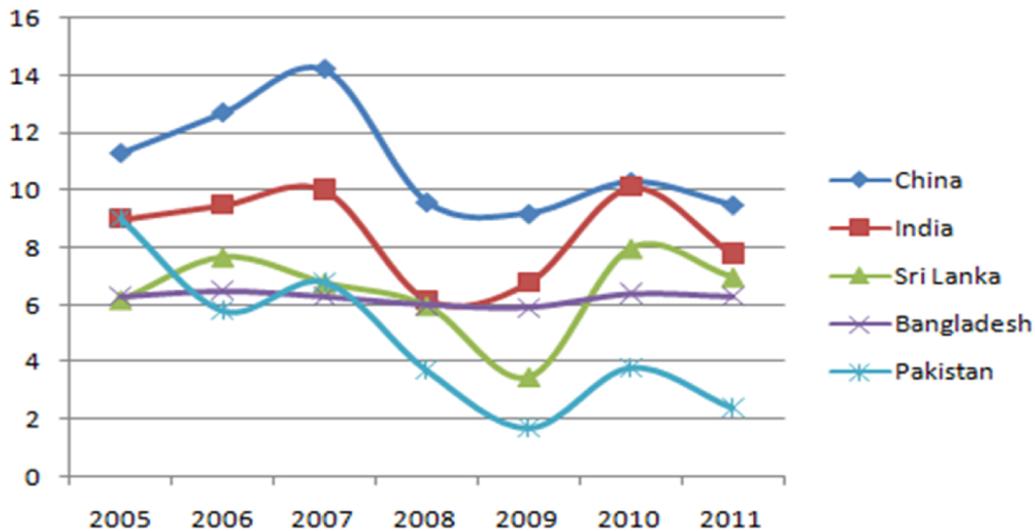
Figure No 3.2: Real GDP Growth Rates (Percent)

Source: Annual Report (2011, P -1), State Bank of Pakistan

Apart from the sensitivity of Pakistan economy to global economic performance, there are some other structural factors which also keep it depressed in terms of productivity growth and development. There is a long list of such factors, however, some most important factors which are inadequate tax system, trade barriers with neighboring countries, incompetency and inefficiency of public corporations or state owned enterprises, lack of sound privatization well, and inappropriate model for human resource development and social protection. The objective of sustaining high growth, low inflation and external payment viability requires removing these structural barriers, (Economic Survey of Pakistan 2011-12)

THEORETICAL FRAMEWORK

Farhan & Akram (2011) develops a theoretical model for testing effects of interest rate on houshold saving. The model includes three indepent variables such as Per capita income, interest rate, consumer price index with Household savings as a dependent variable. Household saving constitutes a single larger component of national saving of Pakistan. Fluctuations in household saving can greatly affect the performance of national economy through ups and downs in availability of national saving for investment in the country. In other words, household saving is the largest component of national saving which can cause business cycle with significant fluctuation in planned investment in Pakistan. In this context, the determinants of household saving are vital to investigate in the Pakistan or in other words, it is very urgent to know the leading factors which can fluctuate the household saving at macroeconomic level. The response of household saving to various macroeconomic environments in both short run and long run is crucial to be known to policy makers in order to prepare policy packages for smooth uplift of national economy. The relationship between independent variables to dependent variable has been explained, one by one, in sufficient detail.

(a) PER CAPITA INCOME AND HOUSEHOLD'S SAVING

Per capita income and household's saving have positive relationship between them. If the per capita income increases household savings also increase and vice versa. Farhan & Akram (2011). This is known as income effect of inducing saving. Keynes argues that marginal propensity to consume (MPC) is between zero and one, which means that additional income may not be consumed fully.

(b) INTEREST RATE AND HOUSEHOLD'S SAVING

Interest rate and household's saving are also positively related with each other. If the interest rate increases more it induce savers to save more. Farhan & Akram (2011)There are different definitions of interest rate, e.g. lending rate; deposit rate has been used as proxy for interest in the present study. When Interest rate increases, people are encouraged to save more and consume less just to earn more return on deposit. There is a positive relationship between National Saving and rate of interest.

Understanding the response of personal saving to changes in interest rates is central to many issues in economic policy. For example, a reduction in the budget deficit would probably cause interest rates to decline. If personal saving declined as a result, the overall increase in national saving would be less than the reduction in the budget deficit. Alternatively, contractionary monetary policy generally causes interest rates to rise. If personal saving increases as a result, the corresponding fall in consumer spending helps to slow down economy. As a final example, changes in the tax rates can raise or lower the net-of-tax return to saving. The effect of these changes on the amount of saving may play an important role in tax collection. The interest elasticity of saving is defined as the percent change in saving resulting from a one-percent change in the interest rate. There is disagreement among economists about both the sign and magnitude of this elasticity, as existing theory and empirical evidence do not appear to offer any clear conclusions. David & Mackinnon (1990).

(C) CPI AND HOUSEHOLD'S SAVING

Consumer price index and household's savings have negatively related. If CPI increases it decreases the saving rate and vice versa. Farhan & Akram (2011) Consumer Price Index number measures the average rate of Prices in the economy. If Price levels in the economy increases it has two implications:

(i) Due to an increase in Price Level, Producers charge high prices of their product to earn more profits which raise National Saving. There is positive relationship between Consumer Price. Index and National Saving from Producer point of view. Hasnain et al (2006) have also found positive relationship between National Savings and inflation rate.

(ii) Due to an increase in Price Level, Consumers have to pay higher prices and these results in low domestic saving. Hence national saving may fall. From Consumers point of view, there is negative relationship between Consumer Price Index and National Saving. Kazmi (1993) has found negative relationship between National saving and inflation rate. So the Consumer Price Index number influences positively and negatively the National. Figure 4.1 links the interest rate, inflation

Rate, per capita income to household's saving in Pakistan. In below figure shows positive relationship between per-capita income and Interest rate with household savings. And negative relationship of CPI with household savings.
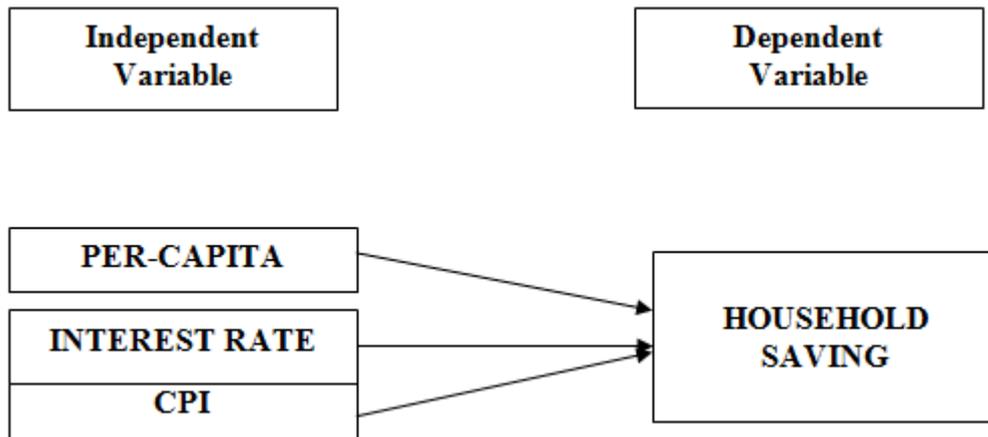
Figure 4.1 Household savings relationship with Per-capita income, interest rate And CPI

Source: Author' Construction using MS office

HYPOTHESIS OF THE STUDY

Based on the review of literature and theoretical framework, the following relationship has been hypothized.

1) Interest rate positively affects household saving.
2) There is positive relationship between per capita income and household saving.
3) There is negative relationship between inflation rate and household saving.

3   RESEARCH METHODOLOGY

This study use Farhan & Akram (2011) empirical model to assess short and long run determinants of household's savings. In the present case, substantial modifications have been made to their model for making it more appropriate in the current context. These modifications are: Firstly, dependency ratio has been excluded from the model because per capita income has been used instead of income level. As per capita income is the income level divided by population, therefore, dependency ratio may exhibit significant mutlicollinearity, if use combined with per capita income, which would hamper consistency of the estimates. This is one of the reasons that present study contributes to the modeling of household's saving in Pakistan. Secondly, since present study uses time series data, therefore estimation techniques need to be consistent with the standard properties of time series data. One of them is the existence of unit root in the time series data. If time series data contains unit root, then Ordinary Least Square (OLS) cannot be used to report consistent and efficient estimates. Therefore, Augmented Dickey Fuller (ADF) test has been used to check the existence of unit root in the data. However, in case of evidence of unit roots in the data, Johanson (1998) co-integration technique can be used to estimate short and long run response of household's savings to various factors including interest rate. These two modifications contribute to the validity of the estimates.

The maximum possible number of years of time series data has been collected, that is, from 1981 to 2011 which make it of 30 years data. In this context, the study is restricted to the total of four variables for ensuring sufficient degree of freedom for macro econometric modeling. Out of these four variables, inflation rate, interest rate and per capita income are independent variables whereas; household's saving is the dependent variable. Econometric properties of the estimates are checked using various tests.

ECONOMETRIC MODEL

The present study uses Farhan & Akram (2011) empirical model to assess the short and long run determinants of household's saving. In the present case, substantial modifications have been made to their model to make it more appropriate in the current context of Pakistan. These modifications are: First, dependency ratio has been excluded from the model because per capita income has been used instead of income level. As per capita income is the income level divided by total population, therefore, dependency ratio may exhibit significant mutlicollinearity, if used combine with per capita income, which would hamper consistency of the estimates. This is one of the reasons that present study contributes to the modeling of household savings in Pakistan. Secondly, the present study deals with time series data, so it is most likely that there may be evidence of Unit Root in the data. If Unit root exist in the data, then Ordinary Least Square cannot be used to estimate the co-efficient. It is one of the reason that Co-integration based modeling techniques has been used to report more efficient and consistent estimates. The macro econometric modeling starts with testing for direction of causality, stationarity and co-integration i.e. testing for existence of long run relationship and constructing appropriate robust error correction model for household saving as a dependent variable. First, direction of causality among variables would be tested using Granger Causality test (Granger, 1969) which is outlined by Karlsson et al., (2002) as given in equation (1) to equation (4):

$$LnHS_t = a_{10} + \sum_{i=1}^{n} a_{1i} LnPCi_{t-i} + \sum_{i=1}^{n} a_{2i} LnCPI_{t-i} + \sum_{i=1}^{n} a_{3i} LnIR_{t-i} + \varepsilon_{1t} \qquad (1)$$

$$LnPCi_t = a_{10} + \sum_{i=1}^{n} a_{1i} LnHS_{t-i} + \sum_{i=1}^{n} a_{2i} LnCPI_{t-i} + \sum_{i=1}^{n} a_{3i} LnIR_{t-i} + \varepsilon_{2t} \qquad (2)$$

$$LnCPI_t = a_{10} + \sum_{i=1}^{n} a_{1i} LnHS_{t-i} + \sum_{i=1}^{n} a_{2i} LnPCi_{t-i} + \sum_{i=1}^{n} a_{3i} LnIR_{t-i} + \varepsilon_{3t} \qquad (3)$$

$$LnIR_t = a_{10} + \sum_{i=1}^{n} a_{1i} LnHS_{t-i} + \sum_{i=1}^{n} a_{2i} LnPCi_{t-i} + \sum_{i=1}^{n} a_{3i} LnCPI_{t-i} + \varepsilon_{4t} \qquad (4)$$

Where "LnHS" is the log of household's saving at current market prices, "LnPCi" is the log of per capita income at market prices, "LnCPI" is the log of consumer price index and "LnIR" is the weighted average rate of return on deposits.

Equation (1) to equation (4) can be estimated by ordinary least square (OLS) method to find out causal relationships among the variables. For instance, if lag terms of "LnHS" and "LnPCi" in equation (1) and equation (2) are statistically significant as group, then there is bilateral causality between "LnHS" and "LnPCi". It means that per capita income would

cause household's saving and vice versa. On the basis of economic theory, it is highly possible that household's saving may cause per capita income increase through investment multiplier.

Similarly, other equations can also be interpreted in the similar ways. For instance, if "LnHS" in equation (1) and "LnCPI" are significant as a group, then there are evidence of bilateral causality between inflation and household's saving. The impact of inflation rate on saving is well documented in literature. If inflation rate is higher than nominal interest rate, then there is negative real rate of return on saving deposit. The negative real rate of return on deposits mean that the value of saving deposit falls over a time. In this case, inflation rate has negative impact on household's saving or it discourage household's to save more. It means that negative rate of return on saving makes the current consumption more attractive than the future consumption.

The dynamic effects of per capita income, interest rate and inflation rate on household saving have been estimated using Johansen (1988) and Johansen et al., (1990) co-integration approach. The Johansen (1988) and Johansen et al., (1990) multivariate co − integration approach has been based on the following steps. First, the estimation of unrestricted vector − autoregressive model (VAR) is required as explained by Halda et al., (2010), as given below,

$$y_t = \sum_{i=1}^{p} \Pi_i \, y_{t-i} + \varepsilon_t \qquad (5)$$

The equation (5) is the unrestricted VAR model, where, "y_t" represent all "N" variables of the model which is four in the present case, that is, per capita income, interest rate, inflation rate and household saving . Π is the N*N matrix of coefficients and "εt" is a vector of random shocks to the system. It is assumed that "εt" is normally distributed with zero mean and constant variance. The VAR model (5) can be written in its error correction (ECM) form as given in equation (6)

$$y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Pi_i \Delta y_{t-i} + \varepsilon_t \qquad (6)$$

Where $\Pi = -\,(I - \sum_{i=1}^{p} A_i)$ and $\Pi_i = -\sum_{j=i+1}^{p} A_j$ and "I" is an identity matrix. If all the variables are integrated of order one i.e. non stationary of same order, than Δy_t are stationary. The estimated coefficients of equation (6) are consistent if the assumption that variables are co-integrated is not violated, then Πx_{t-1} is also stationary or integrated of order zero.

The rank of Π shows number of co-integrating vectors, for instance, if $\Pi=0$, then matrix is null or there is no co-integrating vector at all, and equation (6) shrink to usual first difference VAR model. If $\Pi=1$, then it would means that there is one co − integrating vector, and Πx_{t-1} is the error correction term which shows how system revert to its long run equilibrium in response to any shock in the short run. For multiple co − integrating vectors, rank of Π can be in $0 < \Pi < n$ range, and there exist representation of Π such that $\Pi = \alpha \cdot \beta^{'}$. Where α and β are both (n.r) dimension with "r" being rank of Π. β represents the matrix of co-integrating vectors and α shows speed of adjustment to its long run equilibrium of the whole system.

Basically there are two tests, that is, trace statistic (λ_{trace}) and maximal Eigen value statistic (λ_{max}) which can be used to conclude about the number of co-integrating vectors in the whole system. Once the existence of long run relationship is identified, the next step is to estimate a representative Vector Error Correction model for household's saving as a dependent variable. This can be done by following general to specific approach to VECM i.e. a general VECM may be estimate in the first step. In the second step, the general VECM model may look for matching it with the standard theory. However, if there are some variables which are insignificant or having theoretically incorrect sign, they may be dropped, and yet another version of VECM model may be obtained. Following this general to specific approach, researcher can obtain such model which is more compatible with the standard theories of economics.

4   DATA ANALYSIS AND DISCUSSION

Household's saving rate and inflation are indirectly correlated, that is, at any given nominal interest rate in the market; high inflation rate reduces real interest rate and hence saving too. Similarly, at any prevailing nominal interest rate in the market, if inflation rate falls, it raises the real rate of return on saving. The household's saving response positively to this reduction in inflation rate because low inflation reduces cost of living, and hence increase saving.

Table No 5.1 shows N – way tabulation of consumer price index based inflation rate and log of household's saving. It is evident that high double digit inflation in the range of 20 to 25 percent discourages household's saving, as there is only one frequency out of 31 years which corresponds to a range of 20 to 25 percent inflation rate in the data. Similarly, if inflation rate is in range of 10 to 15 percent, then household's saving in range 10-11 and 11-12 are two and three times in the history respectively . Table No 5.1 also reveals that in past 31 years data, 20 correspondence of household's saving are observed in the range of inflation from 5 to 15 percent. It shows that moderate level of inflation promote household's saving in Pakistan.

Table No 5.1: N – Way tabulation of CPI and LnHS

Count		CPI				
		[0, 5)	[5, 10)	[10, 15)	[20, 25)	Total
LNHS	[10, 11)	1	2	2	0	5
	[11, 12)	2	3	3	0	8
	[12, 13)	0	2	4	0	6
	[13, 14)	5	2	0	1	8
	[14, 15)	0	1	3	0	4
	Total	8	10	12	1	31

Source: Author's calculation using Eviews 6.0 portable software

Interest rate is the rate of return on household's saving. Economic theory predicts that other things remain constant; household's saving is positively related to interest rate. Higher interest rate increases the opportunity cost of current consumption, and hence motivate household's to substitute current consumption over future consumption, and vice versa. Table No 5.2 shows the relationship between interest rate and household's saving. It is evident from the table that 6 and 18 correspondence of household's saving fall with the interest rate rang of 4 to 6 and 6 to 8 respectively. Similarly, there is 4 and 2 correspondence in the low range of interest rate which is from 0 – 2 and 2 – 4 respectively. This means that table no 5.2 favor a hypothesis that low interest rate discourage savers and vice versa.

Table No 5.2: N – Way tabulation of IR and LnHS

Count		IR					
		[0, 2)	[2, 4)	[4, 6)	[6, 8)	[8, 10)	Total
LNHS	[10, 11)	0	0	0	5	0	5
	[11, 12)	0	0	0	7	1	8
	[12, 13)	0	0	0	6	0	6
	[13, 14)	4	1	3	0	0	8
	[14, 15)	0	1	3	0	0	4
	Total	4	2	6	18	1	31

Source: Author's calculation using Eviews 6.0 portable software

Table No 5.3 shows the relationship among per capita income and household's saving. Economic theory predict positive effect of income on household saving, that is, other things constant; if household's income increase, then, its saving too. Table No 5.3 favors such theoretical relationship. There are total of four income brackets given in the table, that is, 8 – 9, 9 – 10 and 11- 12. There are five highest correspondences in front of 8 – 9 income range. It further rises to 6 and 7 correspondences in the income groups of 9 to 10 and 10 to 11. Similarly, there are three correspondences out of total of four correspondences in front of highest income group. This shows that income and household's saving are positively related.

Table No 5.3 N – Way of Tabulation of LnPCi and LnHS

Count		[8, 9)	[9, 10)	[10, 11)	[11, 12)	Total
		LnPCi				
	[10, 11)	5	0	0	0	5
	[11, 12)	5	3	0	0	8
LNHS	[12, 13)	0	6	0	0	6
	[13, 14)	0	0	7	1	8
	[14, 15)	0	0	1	3	4
	Total	10	9	8	4	31

Source: Author's calculation using Eviews 6.0 portable software

Table No 5.4 highlights the descriptive statistics of the key variables used in the model. Descriptive statistics convey a general picture of the data. Mean value of log of household's saving is the 12.41 approximately with a standard deviation of 1.24. The maximum value of log of household's saving is the 14.24, whereas, minimum value of log of household's saving is the 10.26. The value of Jarque – Bera test, a test of normality of distribution, is given by 2.14 with probability value of 0.34 which is enough high to accept alternative hypothesis of non-normal distribution of household's saving. The value of skewness is positive, which shows that distribution is positively skewed. Similarly, the value Kurtosis is lower than 3, which means that distribution is platykurtic, that is, distribution is flatter than a normal distribution with a wider peak or values are wide spread around mean value of log of household's saving. This type of analysis are very much relevant for selection of estimation technique for the estimating the econometric model.

The average value of log of per capita income during 1981 to 2011 is 9.66 approximately with maximum of 11.36 and minimum value is 8.08 with a standard deviation of 1.02. Standard deviation of log of per capita income is lower than log of household's saving which shows that observed data is more closed scatter to mean of log of per capita income than log of household's saving. Alternatively, it can be said that log of per capita income is more consistent series than log of household's income, or even in other words, log of per capita income shows less variations around its mean value than log of household's saving. However, it is positively skewed series which is reflected in the value of co-efficient of skewness with value greater than zero. The co-efficient of kurtosis is also less than three, which shows that distribution of log per capita income is platykurtic or non normal. The non-normality conclusion can also be drawn from the calculated value of Jargue Bera test which is 2.05 with probability value of 0.36. It means that, like log of household's saving, log of per capita income data also suffer from non – normality issue. Table No 5.4 also shows the descriptive statistics related to interest rate which is measured by weighted average rate of return on saving deposits. The average rate of return on saving, the interest rate, is 5.87 for the period of 1981 to 2011 in Pakistan. The highest interest rate during this period is 8.79 whereas lowest interest is 0.96 per annum. The standard deviation is 2.23, with value of skewness less than zero. It means that interest rate is more negatively skewed, and there is evidence that distribution of interest rate is normal distribution. It means that the observed interest rates, from 1981 to 2011, is closed scattered around mean values with reasonable peaks – which is often known as normal distribution. However, this conclusion is drawn at 10 percent level of probability, that is, the normality of distribution is only accepted at 10 percent level of probability.

Table No 5.4 Descriptive statistics of selected variables

	LNHS	LNPCI	IR	CPI
Mean	12.40218	9.655300	5.869355	8.574194
Median	12.23935	9.650014	7.110000	7.900000
Maximum	14.24135	11.35285	8.790000	20.80000
Minimum	10.26862	8.079308	0.960000	3.100000
Std. Dev.	1.231894	1.014534	2.238592	3.971059
Skewness	0.005024	0.137332	-1.0268	0.731765
Kurtosis	1.715747	1.771250	2.759258	3.863836
Jarque-Bera	2.130482	2.047637	5.522593	3.730503
Probability	0.344645	0.359221	0.063210	0.154857
Observations	31	31	31	31

Source: Author's calculation using Eviews 6.0 portable software

Finally, the behavior of inflation rate (based on consumer price index) is given in the table no 5.4. The average inflation in during 1981 to 2011 is 8.58 which is a single digit rate. However, there are very high and very low inflation rates in Pakistan as well. For instance, the highest inflation rate is 20.09 percent, which is really high enough too beloved that it might be harmful for growth, poverty and household saving. Similarly, lowest inflation, from 1981 to 2011, is 3.2 which is enough low. The value of skewness suggests that distribution of inflation is positively skewed; with leptokurtic distribution as value of kurtosis is greater than 3. It means that distribution of inflation is sharper than normal distribution, which is also reflected in the significant value of Jargue Bera test.

5 CONCLUSION

Saving is the engine of growth and prosperity. It is a source of financing investment in the country, which reduces dependence on foreign aid and loans. There are a number of definitions of saving in Pakistan, namely, public, private, corporate and household's saving. These definitions of saving are important for overall macro-economic performance of an economy. The analysis of saving trend in Pakistan shows that all these definitions of saving are volatile up to considerable extent. It is also concluded that, on the basis of trend analysis that private sector saving is the main driver of overall saving in Pakistan. Interestingly, out of private sector saving, household's saving is nearly 90 percent which highlight its importance in economic development of Pakistan. It is also evident that Pakistan's saving trend is low if compared with regional countries having almost same income level. It is due to low saving rate that saving – investment gap is high in Pakistan, and Pakistan is highly dependent on external borrowing to finance the increasing saving – investment gap. There are several reasons which can be explained for such dismal performance of low savings rate. However, trend analysis shows that lower growth of per capita income, high inflation particularly food inflation and low real interest rate are the main drivers of low saving rate in Pakistan. The quantitative analysis of 30 years past data shows that there are strong evidences that these variables are co-integrated. They contain long run equilibrium relationships. The Error Correction component shows that there may be disequilibrium in the short run, however, there is a significant Error correction component which revert the system back into equilibrium. It is also shown that the effects of independent variables are as per economic theory.

6 SUGGESTIONS

- Household's saving is sensitive to price changes, particularly, high food inflation cause household expenditure to rise, which reduce their ability to save more. It is, therefore, recommended that overall inflation, particularly, food inflation may be kept in desirable limits so that saving can be enhanced in Pakistan.

- Real interest rate is low in Pakistan. There are two basic reasons for this; first, inflation rate is high, and secondly, nominal interest on deposit is low. Indeed, the first argument is more valid as real interest means nominal interest rate minus inflation rate. Now if nominal interest is stable, there real interest rate fluctuates as result of inflation rate.

- Per capita income is the main driver of household saving in Pakistan, however, per capita income is not only low but also have slow growth rate as compared to the neighboring countries. There may be several factors which may account for low per capita income growth there are.

- One of them is the low productivity growth. Pakistan's real GDP is growing very slowly. Growth of real GDP is the main determinant of living standard of an economy.

  o There has been high population growth in the economy. If population growth is increasing, and GDP growth is falling, the resulting Per capita income will be low.

  o There has been high unproductive saving rate in Pakistan which may lead to Per capita income low.

- Pakistan is primarily consumption oriented society. Its economic growth is consumption led. There consumptions are made at the cost of low saving. There may be several factors which can be used to explain such phenomenon; however, there is less number of financial institutes in the rural areas of Pakistan which is also one of the hurdles. People in rural areas are not educated about the value of saving. There are early marriages and expansive traditions which adds more to the consumptions.

- Over 67 percent of population lives in rural areas of Pakistan, which is directly or indirectly dependent on agriculture sector. However, agriculture is highly pro-cyclical in nature. These fluctuations also cause variability in household income. In general, in periods of productivity losses, household depends on debt which is used to repaid in the time of boom in the agriculture sector, so overall saving remain depressed.

REFERENCES

[1] Abdelkhalek, T., Arestoff, F., de Freitas, N. E., & Mage, S. (2009). A Microeconometric Analysis of Household'ss Saving Determinants in Morocco. *Institut national de statistique et d'économie appliquée (INSÉA), Maroc* , Pp .1-18.

[2] Abid, S., & Afridi, G. S. (2010). Assessing the Household's Saving Pattern of Urban and Rural Household'ss in District Muzaffarabad. *Pakistan Journal of Life and Social Sciences* , Pp .137-141.

[3] Agrawal, P., Sahoo, P., & Dash, R. K. (2007). Savings behaviour in South Asia. *"Expanding Freedom: Towards Social and Economic Transformation in a Globalizing World"* , Pp . 1-36.

[4] Ahmad, M., & Asghar, T. (2002). Estimation of Saving behaviour in Pakistan using Micro Data. *The Lahore Journal of economics, vol 9, No.2* , Pp .73-98.

[5] Ahmad, M., & Asghar, T. (2002). Estimation of Saving Behaviour in Pakistan Using Micro Data. *The Lahore Journal of Economics, Vol.9, No.2* , Pp .73-91.

[6] Ali, M. S. (1985). Household's Consumption and Saving Behavior in Pakistan: An Application of the Extended Linear Expenditure System. *The Pakistan Development Review vol.xx1v, No.1* , Pp .23-37.

[7] Alves, N., & Cardoso, F. (Winter 2010). Household Saving in Portugal: micro and macroeconomic evidence*. *Economic Bulletin | Banco de Portugal* , Pp. 47-67.

[8] Azam, M., Khan, M., Khan, Z., Shafiqullah, Ali, S. I., & Qaiyum, A. (2010). Significance of National saving in the socio-economic development of Pakistan: 1974-2009. *Sarhad j. Agric vol.26, no.3, 2010* , Pp .413-417.

[9] Bishop, J., & Cassidy, N. (2012). Trends in National Saving and Investment . *Bulletin, Reseve Bank of Australia*

[10] Burney, N. A., & Khan, A. H. (1992). Socio-economic Characteristic and Household's Saving: An analysis of the Household's's Saving Behavior in Pakistan. *The Pakistan Development Review* , Pp . 31-48.

[11] Central Intelligence Agency - CIA . (2012). *Pakistan Economy*. Retrieved June 16, 2012, from The World Fact Book: https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html

[12] Chaudhry, I. S., Faridi, M. Z., Abbas, M., & Bashir, F. (2010). Short Run and Long Run Saving Behavior in Pakistan: An Empirical Investigation. *Journal of Money, Investment and Banking* , Pp .57-65.

[13] Christensen, L. (2012). How Are Interest Rates Affecting Household's. *All Graduate Reports and Creative Projects* , Pp. 200-215.

[14] Deaton, A., & Paxson, C. (1998). Saving and growth: another look at the cohort evidence. *Research Program in Development Studies Princeton University*, Pp .1-32.Economic survey of Pakistan (2011-12), P-2

[15] Economy Watch. (2010, March 29). *Pakistan Economy*. Retrieved June 15, 2012, from Economy Watch: http://www.economywatch.com/world economy/pakistan/

[16] Elmendorf, D. W. (1996). The effect of interest-rate changes on household's saving and consumption:a survey . *Federal reserve board* , Pp .1-84.

[17] Ersado, L., Alwang, J., & Alderman, H. (2000). Changes in Consumption and Saving Behavior before and after Economic Shocks: Evidence from Zimbabwe. *International Food and Agribusiness Management Association Conference, Chicago* , Pp .1-39.

[18] Farhan, M., & Akram, M. (2011). Does Income Level affect Saving Behaviour in Pakistan?An ARDL approach to co-integration for empirical assessment. *Far East Journal of Psychology and Business* , Pp .62-117.

[19] Fry, M. J. (1998). Saving, investment, growth, and financial distortions in pacific asia and other developing areas. *International economic journal volume 12, number 1* , Pp .1-24.

[20] Gaire, N. H. (2010). Real interest Rate and Saving Behavior in Nepal. *Banking journal,volume 2 (issue 1)* , Pp .16-34.

[21] Hagiwara, A. T. (2010). Have Filipino Households Become Less Prudent? *Asian Development Bank; 6 ADB Avenue, Mandaluyong City 1550, Philippines* , Pp. 1-22.

[22] Hussein, K. A., & thirlwall, a. P. (1999). Explaining differences in the domestic savings ratio across countries: a panel data study. *Jel classification: e21* , Pp 1-32.

[23] Kapoor, M., & Ravi, S. (2007). Expect of Interest Rate on Consumption. *Indian School of Business* , Pp. 1-19.

[24] Kazmi, A. A. (1990). A Study on Saving Functions for Pakistan: The Use and Limitations of Econometric Methods. *The Lahore Journal of Economics, Vol.6, No.2* , Pp .57-101.

[25] Hussein, K. A., & thirlwall, A. P. (1999). Explaining differences in the domestic savings ratio across countries: a panel data study. *Jel classification: e21* , Pp .1-32.

[26] Kapoor, M., & Ravi, S. (2007). Effect of Interest Rate on Consumption. *Indian School of Business* , Pp. 1-19.

[27] Khan, R. E., & Hye, Q. M. (2010). Financial sector reforms and household's savings in Pakistan: An ARDL approach. *African Journal of Business Management Vol.4 (16)* , Pp .3447-3456.

[28] Kibet, L. K., Mutai, B. K., Ouma, D. E., Ouma, S. A., & Owuor, G. (2009). Determinants of household saving: Case study of mallholder farmers, entrepreneurs and teachers in rural areas of Kenya. *Journal of Development and Agricultural Economics Vol. 1(7), pp. 137-143, October, 2009 ISSN 2006- 9774 © 2009 Academic Journals* , Pp. 137-143.

[29] Lavoto, B. N. (N.D.). The effects of interest rates on savings in the developing countries. *African journal* , Pp. 101-118.

[30] Malhotra, T. (2011). Proposal of research. A study of determination of saving in malaysia. *African journal of economics* , Pp. 1-40.

[31] Mohsin, H. M. (2011). The impact of monetary policy on lending and deposit rates in pakistan: panel data analysis. *The lahore journal of economics* , Pp .199-213.

[32] Nabar, M. (2011). Targets, interest rates, and household saving in urban china . *3 © 2011 international monetary fund wp/11/223* , Pp. 1-28.

[33] Nasir, S., & Khalid, M. (2002). Saving – investment behaviour in pakistan: an empirical investigation. *The pakistan development review* , Pp . 1-16.

[34] Nayak, S. (May 2013). *Determinants and pattern of saving behaviour in rural households of western odisha.* Rourkela – 769008, india: department of humanities and social sciences .

[35] Obayelu, O. A. (2012). Saving Behavior of Rural Households in Kwara State, Nigeria. *African Journal of Basic & Applied Sciences 4 (4):* , Pp. 115-123.

[36] Rehman, H. U., Bashir, F., & Afridi, M. Z. (2011). Savings behaviour in different income groups in pakistan: A Mrco Study. *International Journal of Hummanities and Social Sciences* , Pp. 268-277.

[37] Reinhart, C. M., & Tokatlidis, I. (2001). Before and After Financial Liberalization *Preliminary and incomplete* , Pp .1-52.

[38] Shahbaz, M., Ahmad, N., & wahid, A. N. (2010). Savings–investment correlation and capital outflow: the case of Pakistan. *Transition finance, banking and currency research* , Pp .80-97.

[39] Shaikh, S. A. (2010). Consumption & Savings Behavior in Pakistan. *JEL Codes E21, G11* , Pp .1-13.

[40] Siddiqui, R., & Siddiqui, R. (1993). Houshold Saving Behavior in Pakistan. *The Pakistan Development Review* , Pp .1281-1292.

[41] State Bank of Pakistan . (2006). *Trends in Financial Saving - Financial Stability Review .* Islamabad : State Bank of Pakistan, Government of Pakistan.

[42] State Bank of Pakistan . (2007-08). *Trends in financial savings - Financial Stability Reveiw .* Islamabad : State Bank of Pakistan, Government of Pakistan .

[43] State Bank of Pakistan . (2007-08). *Trends in financial savings - Financial Stability Reveiw .* Islamabad : State Bank of Pakistan, Government of Pakistan .

[44] State Bank of Pakistan . (2007-08). *Trends in National and Financial Savings - Financial Stability Review.* Islamabad : State Bank of Pakistan, Government of Pakistan .

[45] State Bank of Pakistan. (2012-13). *Economic Growth, Investment and Saving - State Bank of Pakistan Annual Report .* Islamabad : State Bank of Pakistan - Government of Pakistan

[46] Thaler, H. R. (1990). Psychology and savings policies. *Johnson Graduate school of Management Malot Hall* , Pp. 1-7.