The Determinants Of Savings: Empirical Evidence From Pakistan.

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ABSTRACT
Economic theory suggests that national savings is an important component of growth in every economy. In developing countries like Pakistan that is performing well in terms of growth, one cannot rule out the fact that savings has got a role to play. The most significant economic relation between present, past and future of any country is described by its savings. The aim of this study was to analyze the impact and relationship between national saving rate and some selected determinants of saving namely inflation, real interest rate, real GDP growth rate and Government current expenditure, by using annual data for the period of 1980-2010. The variables in our model are based on well-established economic theory and long standing relationship. Supplemented in a dynamic regression model with the ARMA specification and well specified model; it was found that inflation, interest rate and government expenditures are negatively affecting the national savings rate during the length of this study for the economy of Pakistan.

Key Words: National Savings, Government Expenditures, Real Interest Rate, ARMA.

1. INTRODUCTION

Economic theory holds savings as that part of national income which is in excess of current expenditure and are held in reserves for future use. Simply putting, savings are usually held in the form cash or deposits in banks. In the broader sense, the value of all assets held, that may be in the forms of financial assets, stocks or inventories, equipment, and land (Rehman, Faridi and Bashir, 2010).

Economic theory suggests that national savings is an important component of growth in every economy. In developing countries like Pakistan, Turkey, India Malaysia and other Asian countries that are performing well in terms of growth, one cannot rule out the fact that savings has got a role to play. The most significant economic relation between present, past and future of any country is described by its savings. Stated that if a low rate of savings maintained over a large period of time, it may besiege the economy into a malicious circle of low investment, low productivity, low growth, and low per capita income and so on. Therefore high rate of saving is a pre-requisite for any country to move out from low saving and low growth equilibrium. (Ahmed and Asghar, 2004).

Pakistan is one of those developing countries that have maintained decent growth despite a lot of underlying structural problems and economic fluctuations. Average growth rate in real GDP during the last fifty years had remained at above 5% and per capita real GDP growth rate has also remained above 2%. But when we compare with East Asian countries, the country has fallen short of to achieve high growth rate. (Vincelette, 2006). They further highlight that during 1973-2005, the domestic saving rate of Pakistan has been significantly lower compared to the other fast growing East Asian economies, which have similar per capita income. Historically, the national saving rates of Pakistan, India and Malaysia show an upward direction (in FIG 1), but the rise in the saving rates of Malaysia is much higher than the increasing rate of Pakistan’s savings.
Fig 1; Comparison between Pakistan, India and Malaysia saving rates.

<table>
<thead>
<tr>
<th>Table 1 Saving trends (As Percentage of GDP - Current Market Price)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Growth Rate</td>
</tr>
<tr>
<td>Total Investment</td>
</tr>
<tr>
<td>National Saving</td>
</tr>
<tr>
<td>Foreign Saving</td>
</tr>
<tr>
<td>Domestic Saving</td>
</tr>
</tbody>
</table>

Source: Economic Survey of Pakistan (2010-2011)

Fig 2: Historical Saving Trends in Pakistan. Adopted from Economic Survey of Pakistan (2010-2011)

It is a complex exercise to do a meaningful analysis of saving behavior of any economy because of indefinite determinants of savings and the division of these determinants into economic, social, political and cultural behavior. However as a starting point one can narrow down these into some of the major forces that shape the economic scenario of a country; like the real GDP growth rate, real rate of interest, inflation, (Ahmad and Mahmood, 2013) and Government current expenditure. In this study, these aforementioned determinants are selected and examined as the determinants of saving for Pakistan that are essential to portray the economic picture of Pakistan.

1.2 Objectives of the study

The primary objective of this study is to examine the relationship of savings with selected determinants; Inflation, Real Interest Rate, Real GDP Growth Rate and Government Expenditures for the economy of Pakistan.

The rest of this study proceeds as follows; section 2 is a brief review of contemporary literature on the subject matter at hand, in section 3, methodology has been devised while in section 4 the results are presented. Finally conclusions are drawn in section 5.

2. LITERATURE REVIEW

Ahmad and Mahmood (2013) explained the determinants of national saving in the process of economic growth .They used Auto Regressive Distributed Lag Model (ADRL) bound testing approach for co-integration to check the strength for long run relationship and Error Correction Model (ECM) for short run dynamics during the 1974-2010. They found that per capita income is inversely related with national saving rate both in long run and short run. The exchange rate and inflation rate has a negative impact on national savings. Trade openness is positively associated with national savings in Pakistan. Money supply is positively linked with national savings the growth of income level has negatively related with national savings. They finally conclude that Keynesian and permanent income hypothesis of income and savings is not valid for Pakistan.

Ahmad and Asghar (2010) the most significant factor that has a positive impact for household saving of Pakistan is the income .There is negative effect of wealth (urban and rural) for Pakistan’s saving behavior. High dependency ratio due to rapid rate of increase of population is considered highest significant negative factor for household savings of Pakistan. Employed person has positive impact for saving. Urban population has negative relation with savings but rural population save more due to more education. Saving also decreases with age. In case of urban household only male head consider for saving but it is not true for rural areas of our country.

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Cheng and Li (2008) identified the determinants of Malaysian’s saving. The research work is based on Life Cycle Hypothesis. In this study independent variables like income per capita, saving account deposit rate, rate of inflation and money supply taken as the determinants of saving from the period of 1980-2006. The results showed that income level is positively related with savings. Real interest rate also showed a positive relation with national saving but not statistically significant. Inflation is also positively correlated with national savings of Malaysia’s. Financial depth and development of Malaysia tend to have higher national saving.

Narayan and Siyabi (2005) examined the determinants of Oman’s national savings for the period of 1977 to 2003. They used ADRL model to find out the determinants of national savings for long run period and also for short period of time namely income per capita, current account, rate of urbanization, supply of money and (domestic) credit. They found significant impact of current account, urbanization rate and money supply on Oman’s saving in the Long run.

Farhan and Akram (2011) identified the long and short run effect of income level and saving behaviors of Pakistan along with inflation and age dependency ratio by using co-integration and (ECM) for the period of 1989-2009. They applied ARDL approach and concluded that income level is equally important and highly positively significant to saving behavior in Pakistan. In short run one percent increase in income level rises savings 1.82% and in Long run one percent increases in income rises savings 5.14%. In long run inflation increases, saving decreases but in short run there is no statistical significance between inflation and savings.

Gedela (2012), by using the Multiple Regression Model and Logistic Regression Model found out the determinants of saving behavior of household in tribal and rural areas. The data of 120 household has been collected from both rural and tribal areas for interview. The study found that head of the household’s age, sex, ratio of dependency, income and expenditures on medical have very important relation with saving pattern of tribal and rural areas. In the parts of tribal ratio of dependency and expenditures on medical are significantly affected on savings for the households.

Adjei (2013) investigate the determinants of national savings in Ghana. By using data for the year of 1975-2008. To achieve this Johansen Co integration and ECM has utilized to found out the dynamics of long and short period of time for determinants of saving. The results showed that In the long run income and terms of trade have positive and significant influence on savings while political instability, dependency ratio and the interest rate have negative impact on saving and financial deepening is not significantly affected for saving. While for short run financial deepening, political instability, interest rate, dependency ratio and income have no significant influence on savings, only the terms of trade was found to positively affect savings.

Shaikh (2012) used ordinary least square (OLS) multiple regression and paris-winsten estimation procedure to examine the relation of national saving rate with real GDP growth rate, market capitalization growth rate, federal debt growth and inflation for Pakistan. He used secondary data for period of 1974-2009. They found that national saving rate is positively related with real GDP growth rate and market capitalization growth rate of listed stock. But national saving rate is negatively related with federal debt growth and inflation rate.

Vincelette (2006) explained that since its independence (1947) Pakistan is facing very sharp fluctuation in the movement of the economy of Pakistan. He argued that to prolong the growth of economy of Pakistan with rise in investment, Pakistan should finance its investment with increasing the rate of domestic savings. This paper estimates the Pakistan’s saving behavior with its income, fiscal policy, financial deepening and demographic determinants (consider it significant) and to formulize a special policy which can measure the changes of savings for medium and long run period of time. This research is divided into different parts. Section 2 explain the current saving behavior of Pakistan. Section 3 analyze the impact of microeconomic factors on the saving rate of Pakistan. SEC 4 demonstrate the Pakistan’s saving behavior with variables i-e fiscal policy, income,
financial development and demographic determinants. SEC 5 discuss the methods of specific policy which can utilized to enhance the domestic saving rate.

In Jappelli and Pagano (1998) research the time series and across country evidence suggest an effective positive correlation of growth and aggregate savings. The life-cycle model shows that a strong positive impact of growth on saving which is only possible with the procedure of aggregation. Rise in the rate of growth of income due to rise in the productivity or we can say that increase in growth of labor force. It also increases the young savers resources (net savers) as compare to old person (dis saved)

Khan and Abdullah (2010) examined the Malaysian’s saving determinants with the help of life cycle model for the period of 1978-2007. The result reveals that income per capita, rate of return, dependency by old age and inflation are the factors of the national savings. In the long run income, rate of returns, government fiscal balance, young dependency, old dependency, and inflation are the factors for private savings... In short run analysis based on ECM model found that per capita income, government fiscal balance and young age dependency are the important determinants of national saving. In short run per capita income, rate of return and young age dependency are private saving determinants.

The study by Nasir, Khalid and Mahmood (2004) estimated saving function for Pakistan economy by using Ordinary Least Square (OLS) method. The time series data consist of observations collected for 33 years (1971-2003). They 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 and savings signify the importance of substitution effect as compare to income effect. Remittances are also found to be positively associated with savings which is consistent with other studies.

Mualley (2011) examined the response of domestic savings in a set of African countries to per capita income, commercial banks, interest rate and the age dependency ratio. For this study ordinary least square (OLS) method is applied to cross section data on domestic savings, income, commercial banks, interest rate and age dependency ratio taken from African countries for the period of 1990 to 1999. The results suggest that African savings are elastic to income only.

Jilani, Sheikh, Cheema and Shaik (2013) analyzed the effect of many determinants on Pakistan’s savings. These determinants are growth of GDP, rate of inflation, fiscal deficit and interest rate. This study has taken the secondary data for the period of 1973 to 2011. They used Co-integration and Error correction model to analyze the short and long run and short run effect of determinants. The findings of results shows the significant relation of inflation, fiscal policy, and GDP with Pakistan’s saving rate. By analyzing the Coefficients conclude that rate of growth and rise in government consumption show positive affect to enhance the national savings, only inflation shows negative relation with national savings of Pakistan.

**2.2 Hypothesis development**

It was hypothesized in this study that inflation, real interest rate, real GDP growth rate and Government expenditures are positively linked with national saving.

**2.3 Theoretical frame work**

By using a specified model we explain the impact and relation of independent and dependent variables in this study. The model used as follows;
3. RESEARCH METHODOLOGY

In order to test the hypothesis of this study, the variables are supplemented into the following regression model as:

\[
\ln NSR = \alpha + \beta_1 \ln RGDP + \beta_2 \ln CPI + \beta_3 \ln GCE + \beta_4 \ln RIR + \varepsilon_i \quad \ldots \ (1)
\]

Where;

- \( \ln NSR \): the natural log of National Saving Rate.
- \( \ln RGDP \): the natural log of Real GDP Growth Rate.
- \( \ln CPI \): the natural log of Inflation as measured by Consumer Price Index
- \( \ln GCE \): natural log of Government Current Expenditures as % of GDP
- \( RIR \): Real Interest Rate

However, as this study utilizes the time series data, the simple OLS may not be able to capture the dynamic autoregressive time series effects of the variables in our model plus there is a strong tendency for the presence of serial correlation in our model. Hence to cater for that the following ARMA model has been devised as;

\[
\ln NSR = \alpha + \beta_1 \ln RGDP + \beta_2 \ln CPI + \beta_3 \ln GCE + \beta_4 \ln RIR + AR(1) + MA(1) + \varepsilon_i \quad \ldots \ (2)
\]

For years the ARMA processes are considered to be the working horse for time series analysis for the reason(s) being that typically the classical linear regression model(s) tries to explain the variation in the dependent variable by summing the linear functions of explanatory variables plus with some noise. Whereas ARMA
processes, regresses the explanatory variables against its own past values (hence called the autoregressive) and adds the noise as a moving average process. This gives a greater advantage of eliminating the problems of serial correlation, in this study the scheme for the ARMA terms is assumed to be the traditional Markov first order autoregressive scheme (Gujarati, 2012).

3.2 Data Specification

In this study annual time series data has been used and is extracted from the State Bank of Pakistan’s Handbook of Statistics 2010 and the world development indicators over the period of 1980 to 2010.

4. Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>12.69414</td>
<td>0.350754</td>
<td>36.19104</td>
<td>0.0000</td>
</tr>
<tr>
<td>ln RGDP</td>
<td>-0.014308</td>
<td>0.042757</td>
<td>-0.334629</td>
<td>0.7411</td>
</tr>
<tr>
<td>RIR</td>
<td>-0.015571</td>
<td>0.007346</td>
<td>-2.119657</td>
<td>0.0456</td>
</tr>
<tr>
<td>ln CPI</td>
<td>-0.188436</td>
<td>0.084510</td>
<td>-2.229735</td>
<td>0.0363</td>
</tr>
<tr>
<td>ln GCE</td>
<td>-0.529829</td>
<td>0.121195</td>
<td>-4.371704</td>
<td>0.0002</td>
</tr>
<tr>
<td>AR(1)</td>
<td>0.321961</td>
<td>0.028342</td>
<td>1.670550</td>
<td>0.1090</td>
</tr>
<tr>
<td>MA(1)</td>
<td>-0.967780</td>
<td>0.088214</td>
<td>-34.14626</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Table 1: Regression Results

The results presented at table 1 indicates that all the estimated parameters are statistically significantly different from zero with the expected signs except that of Real GDP (RGDP). The slope coefficient for RGDP is surprisingly negative but is statistically insignificant at any given level of significance, hence losing any further significance in this study. The negative sign implies that increase in savings would result in decrease in the aggregate productivity that is, money, if set to remain idle for a long time will depreciate and will not bring any good to the bearer. It also indicates the importance of investment to generate returns which will result in increase in the aggregate productivity or aggregate income for an economy.

The coefficient for Real Interest Rate, signifies with the expected sign that on average with an increase of one percent in real interest rate, the rate of national savings is decreased by 0.0155 percent. Similarly CPI is contributing a decrease of 0.188 % on average in the national savings. Likewise government expenditures is highly significant with a negative coefficient, indicating that on average 0.529 % decrease is observed in national savings due to the government expenditures. This is in line with the theory of crowding out effects.

The R² and the Adj. R² values tell the story of a perfect fit, however in ARMA models, these values are usually observed to be high, but at the same time the Akaike Info Criterion and the Schwarz (Baysian) Info Criterion are exceptionally good, indicating a strong model fit. Similarly the F-Statistic also presents a favorable picture of strong model fit. The ARMA specification is also significant, supporting our view that the model is indeed an autoregressive moving averages process of order 1.
Finally the Durbin Watson statistic does not indicates any signs of autocorrelation, however some other diagnostic tests are also necessary to conduct which include the serial correlation, normality and heteroscedasticity tests with the results as follows;

| Breusch-Godfrey Serial Correlation LM Test |  |
|-----------------|-----------------|-----------------|
| F-statistic      | 0.578857        | Prob. F(2,20)   | 0.5697 |
| Obs*R-squared   | 1.574629        | Prob. Chi-Square(2) | 0.4551 |

| Heteroskedasticity Test: White |  |
|-----------------|-----------------|-----------------|
| F-statistic      | 0.500963        | Prob. F(5,24)   | 0.7725 |
| Obs*R-squared   | 2.835126        | Prob. Chi-Square(5) | 0.7254 |

| Normality Test: Jarque-Bera |  |
|-----------------|-----------------|-----------------|
| Jarque-Bera     | 1.877821        | Probability     | 0.3910 |

Table 2: Diagnostic Tests.

The diagnostic tests presented in table 2 are favorable, indicating that the residuals in our model are serially uncorrelated, homoscedastic and normally distributed. Finally the stability for the ARMA terms are presented in the appendix. The roots of both of the AR and MA terms are explicitly within the unit root circle and the impulses are also normal and dies out with time. Hence it can be said that our final estimated model is dynamically stable.

5. CONCLUSION

The aim of this study was to analyze the impact and relationship between national saving rate and some selected determinants of saving namely inflation, real interest rate, real GDP growth rate and Government current expenditure, by using annual data for the period of 1980-2010. The variables in our model are based on well-established economic theory and long standing relationship. Supplemented in a dynamic regression model with the ARMA specification and well specified model; it was found that inflation, interest rate and government expenditures are negatively affecting the national savings rate during the length of this study for the economy of Pakistan.

The robustness and the stability of these results were also checked and our model has the capacity to be extended in future by the inclusion of various other determinants particularly remittances which may be an interesting continuation in this regard as remittances in Pakistan is a prominent phenomenon.

REFRENCES


Ahmad, M. Asghar, T. (2010),” Estimation of Saving Behavior in Pakistan using microdata”. Allama Iqbal Open University. Islamabad


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Appendix

![Image](http://www.ijmsbr.com)
Fig-4: Impulse responses of ARMA roots.