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How Different Elements Affect the Rate of National Savings

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Abstract:

This research study shed light on those elements which effect the rate of saving in different countries of the world. Different countries were selected, based on the availability of data from the 1996-2017. Secondary panel data of the elements which effect national saving were obtained from the official website of the World Bank. Different statistical techniques such as descriptive statistics, correlation matrix, chow test and fixed effects model were applied in this research study. The results of the secondary data revealed that gross domestic product, age dependency ratio, broad money and inflation have statistically significant effect on the national savings of the selected countries while Tax revenue have non-significant effect on national saving of these countries . Gross domestic product, broad money and tax revenue have positive effect on national savings while age dependency ratio and inflation have negative effect on national savings. It is recommended that governments of these countries may attract citizen toward the saving behavior through their effective monetary policy.

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Key words: national saving (NS), gross domestic product (GDP), age dependency ratio (ADR), broad money (BM), Inflation (CPI), Tax Revenue (TR)

1.0 INTRODUCTION

National saving plays a dominant role in the economic development of any country. It strengthen the economic position of developing countries. Saving behavior of citizens can decrease demand for several commodities in the economy, helpful in controlling of high inflations, on the other hand due to less domestic consumption it can also increase the export of any country. Some people save their money at bank lockers but most of the people save their money through investing in government bonds which is also beneficial in controlling of inflation for government as well collection of extra money from public, this process is also helpful for financing investment and improving profitability of business and government organizations.

Gross domestic product of country minus final consumption of country is called national saving. The saving of household, corporations and government in a country is also called national savings. According to (Nga, 2007) Savings plays a vital and collective role for the sustainability and growth of an economy because it encourage investment eliminate poverty and create employment opportunities for the citizens. Mboweni (2008) has stated in his study that high rate of saving is a safeguard which save economies from bankruptcy, devaluation of currency and inflation. The high rate or percentage of national saving plays a pivotal role for the economic growth because high rate of saving and their channelization to investment not only ensures the growth of the economy but it also creates employment opportunities for the citizens and also attract foreign investors for investment (Mboweni, 2008). According to (Khan, 1993) high rate of saving is required for

every country for the purpose to achieve sustainable growth, capital formation and mobilization of domestic resources. In case of achievement of investment and growth rates targets, appropriate national saving rate is an essential and important component (Kazmi, 1993). According to Lucas (1988) high rate of saving and related growth in wealth or capital formation can affect economic growth of the country very positively. Solow (1956) concluded in his research work that growth of economy is influenced by the rate of saving because high rate of saving is important for the economic growth. The economic growth and capital formation is the main goal of every country because citizens of developed countries live with more comfortable and holding a better welfare than the citizens of developing countries. To reduce poverty, unemployment, inflation and to improve the level of per capita income are the main goals of every country.

This research study has focused on the elements which effect national saving of different countries i.e. Malaysia, Philippines, Georgia, Nepal, India, Vietnam, Turkey, Cambodia, China, Pakistan, Russia, Iran, Mongolia, Bangladesh, Thailand, Indonesia, Sri Lanka and Bhutan. This study has employed secondary data regarding elements which effect national savings of the selected countries in the research. The data was collected for period of 1996-2017. Literature review related to dependent variable and all independent variables of study was compiled from published research papers and research reports of different research journals etc. The current research has focused national saving, gross domestic product, age dependency ratio, broad money, tax revenue and inflation. This study has evaluated the factors which have provided a ground for further studies on the role of determinants in term of national savings. The importance of national savings and its awareness has been recognized on international as well as on national levels because it has played central role in decreasing inflation of a country. The effect of

independent variables on dependent variable (national saving) was evaluated and analyzed.

Our research study is different from other research studies in term of geographical location, sample, and number of countries. The present study has considered a sample of eighteen different countries of the world.

2.0 LITERATURE REVIEW

According to Ozcan et al. (2003) the saving of peoples is positively affected by income levels in Turkey. Positive association among per capita income and saving was described by life cycle hypothesis. Metin-Ozcan, et al. (2003) investigated the empirical elements of private saving comportments in Turkey from the year 1968-94 using the OLS (ordinary least squares) estimation method in their research study. They recognized 6 separate explanatory variables in their study including public saving as a proxy of government policies income variable; financial variables measured as the ratio of M2 to gross national product (GNP), and real interest rate on saving deposits; external variable measured as the terms of trade and current account deficit; demographic factors such as urbanization ratio, youth dependency ratio, old dependency ratio and life expectancy ratio; uncertainty variables (inflation). The study found that government savings to Gross Private Domestic Investment ratio (GPDI) and the Turkish economic crisis had significant negative effects on saving behavior. In addition, the study found that a deeper financial system, inflation and terms of trade shocks all had a positive impact on private savings. The effect of the current account deficit as well as the growth of income was statistically insignificant in Turkey. The study found that financial market development, macroeconomic stability, life expectancy, external factors and economic crisis have a significant impact on household saving in Turkey. This study used OLS to estimate time series data, as

such the results are not reliable as the OLS would produce biases estimators.

Newman et al. (2008) conducted research study on causes of saving which emphasized that three different elements has affected domestic saving performance in Africa. In which one was the ability of a person or individual to save money as his disposable income. The 2nd was the tendency to save as influenced by socio-cultural and financial elements like domestic expenses to educate offspring. However to save and return on saving was the third opportunity. In addition to that size of family has controversial and negative influence on individual savings signifying that grand families have more sources constrained than little one's with disposable earnings and assuredly a worse level of savings.

Abbas and Bashir (2010) reported the factors of National Savings for short and long term in Pakistan. Time series data was applied by the author for the period or time from 1972-2008 by using vector error correction model (VECM) and Johansson Co integration method. The descriptive factors that influence the rates of National Savings in long term were price index, interest rate, exports, workers remittance, public loans, consumer and government spending. In long term public loans were inversely connected to rate of saving while interest rates, export, consumer price index, workers remittance and Government spending have vital and constructive or positive effect on rates of national savings. The interest rates and workers remittance was positively related with saving rates for short period.

Imran et al. (2010) reported consumer price inflation, public loans, interest rates, government consumption and remittances were as main factors of national saving. They revealed that these independent variables owns long run connection with dependent variable i.e. national savings, somehow or other these variables are co-integrated. Weller and Rao (2010) conducted study on tax revenue and domestic

savings. They reported direct relationship of tax revenue and domestic savings. Rehman et al. (2010) studied the causes of families saving and recognized that age has positive connection with rate of savings. Issahaku(2011)reported that age structure and properties does not have major influence on saving. Components which make families or domestic investment were expenditure and occupation.

Chaudhry, Faridi, Abbas and Bashir (2010), examined the determinants of national savings of Pakistan in short run as well as in long run. The author used time series data for the period 1972-2008 and used Johansson Co integration technique and vector error correction model (VECM) .The explanatory variables that effect national saving in long run used in this study are workers remittance, public loans, consumer price index, interest rate, exports and government spending it was found that in long run public loans were negatively related to saving rates while consumer price index, exports, interest rates, workers remittance and Government spending have significant positive influence on national saving. On the other hand in short run time period interest rate and workers remittance had positively related with saving.

In 2010, Kim analyzed the factors of personal saving in USA from the year 1950 – 2007. He used OLS and found same results to Kulikov et al. (2007) for Estonia. He further found that the coefficients of lagged private saving, real estate loan and tax were negative. This implies that the higher the amount of personal saving in the period, the lower the amount of private saving in the current period. Kim (2010) however, found that, old dependency ratio to be insignificant in determining personal saving, while the employment rate was only significant at 5 percent. Surprisingly, Kim (2010) found that economic growth negatively impacts personal saving. This implies that during good economic times, people save less and during bad economic time's people save more as they expect the

bad economic times prevail and as take precaution for the future.

Simleit, Keeton and Botha (2011), the income variable (disposable per capita income) was found to be positive. However, this difference could stem from the different proxy used to measure income in the two studies. Government debt to GDP ratio and inflation had also had a positive impact on household saving. In addition, financial deepening was reported to have a negative impact, while echoed the results of Simleit, Keeton and Botha (2011), and Mahlo (2011) with a negative coefficient for interest rate.

Mishi (2012) studied the trends and factors of household saving in South Africa with a VECM method from the year 1963 and 2011. The variables included in the VECM were growth rate of real disposable income (GDP per capita), ratio of household saving to household disposable income, interest rate (proxy: risk premium), public saving (proxy was government debt to GDP), and financial deepening (ratio of M2 to GDP). In contrast to the results by

Girma et al. (2014) reported the causes of domestic savings in Oroomia region, Ethiopia. In this research study different nine important factors, explanatory variables of domestic savings were analyzed which contains family head's education status and level, profit, capital, income, access to credit services, training membership, contact with extension, forms of savings and saving objects. Samantaraya et al. (2014) used Autoregressive Distributive Lag (ARDL) techniques in their study in order to investigate those factors which influencing household savings in India during the year 1992 – 2012. Variables included in their study were age dependency ration, inflation, gross fiscal deficit-GDP, real GDP ratio, personal income tax to GDP ratio, share of agriculture in total GDP, and external terms of trade. They found the existence of a long run association between the variables. Income and age dependency showed a positive impact while interest rate and

inflation were negative. The terms of trade and fiscal were insignificant in explaining household saving in India.

M.I Khan et al. (2017) investigated determinants of national saving in six south Asian countries including Sri Lanka, Nepal, Pakistan, Bangladesh, India and Bhutan. Panel data were used for econometrics analysis of the selected countries from the year 1989-2013. Results of their study indicates that inflation, tax and gross domestic product have statistically significant effect on the gross domestic savings while per capita income, interest, money supply growth and age dependency ratio have non-significant effect on gross domestic saving. Inflation, tax revenue and gross domestic product showed positive effect on gross domestic saving.

3.0 RESEARCH METHODOLOGY

PANEL DATA

Panel data were used for econometric analysis in order to examine the Elements which effect national savings in Iran, Mongolia, Nepal, India, Vietnam, Turkey, China, Pakistan, Russia, Cambodia, Sri Lanka, Bangladesh, Thailand, Indonesia, Malaysia, Philippines, Georgia and Bhutan. The method of panel data has furnished accurate information. The results obtained from panel data technique were more accurate and generalized because of less Co-linearity between the selected variables of this research study.

FIXED EFFECT MODEL

According to Wooldridge (2001) fixed effect model furnish the imbalanced results in regression model, generated due to omitted variables. Intercepts are different for people while coefficient's slopes are constant in fixed effects model Gujrati (2003); Baltagi (2008).

RANDOM EFFECT MODEL

In this model the mean of all intercepts of the cross sectional units is the value of intercepts. It was applied for robust errors, where Heteroskedasticity was found in data.

CHOW TEST:

This test was applied to select among Fixed Effects Model and Pooled regression Model.

BREUSH-PAGAN TEST:

For selecting between pooled Model and Random Effects Model, Breusch-Pagan Test has been used in this research study.

HAUSMAN TEST:

In this research study Hausman test (1978) was applied to select among Fixed Effects Model and Random effect model.

REGRESSION MODEL

Below is the model which was used for the assessment of present research study.

$$NS_{i,t} = + \beta_1 GDP_{i,t} + \beta_2 ADR_{i,t} + \beta_3 BM_{i,t} + \beta_4 TR_{i,t} + \beta_5 INF_{i,t}$$

Where

i is for country.

t is for year

NS: Growth of national saving

GDP: Gross Domestic Product

ADR: Age Dependency Ratio

BM: Broad Money

TR: Tax Revenue

INF: inflation rate

While, α: constant β1, β2, β3, β4 and β5 are called the regression coefficients, and $\mathcal{E}$ is the random error terms.

Dependent Variable

In this research study our dependent variable is national saving

National Savings

In economics, a country's **national savings** is the sum of private and public **savings**. It is generally equal to a nation's income minus consumption and government purchases. The overall private corporate and public saving in the form of liquid assets in a country is called domestic savings. An adequate domestic saving rate is an essential condition for attainment of investment or capital formation and growth rate target of a country. (Kazmi, 1993). Saving is a shield which protects economies from bankruptcy. (Mboweni, 2008).

INDEPENDANT VARIABLES

In this research study we have taken Gross Domestic Product, Age Dependency Ratio, Tax Revenue, Broad Money and Inflation as our independent variables.

GROSS DOMESTIC PRODUCT

The value of all finished commodities or products and services produced in a state or country in a particular time (i.e. one year) is known as Gross Domestic Product. There is a positive and durable connection among growth and national saving. According to Maddison (1992) and Bosworth (1993) GDP has constructive relationship with the rate of saving and economic growth.

AGE DEPENDENCY RATIO

Age dependency ratio is the percentage of dependents which includes from people younger than 15 or older than 64, to the working-age population (ages 15-64). According to previous relevant research studies it seems that demographics (size, age and structure of households) affect the rate of domestic saving

of a country. According to Modigliani (1970) people save more and more money at the middle age as compare to young or old age. The proportion of the working age population to total population of a country is called the percentage of age dependency ratio. According to Masson et.al. (1998) countries with high percentage of working age population present high saving percentage rate as compared with other nations with minimum ratio of working age population.

BROAD MONEY

Brookin (2001); Narayan and Siyabi (2005) reported in their researches that money supply (M2) have opposite and inverse connection or link with aggregate savings. As money supply will increase then aggregate savings will be decreased.

TAX REVENUE

All type of Excise duty and custom duty plus Interests and Penalties collected by government itself depend on Provincial and Local Government to perform as its gathering facilitators. Weller and Rao (2010) conducted a study on tax revenue and domestic savings, the result showed that they have direct relationship among each other. The tax revenue has positive relationship with national savings.

INFLATION (CPI)

It can be defined as when prices of commodities increase and value of money decrease in an economy. When prices of commodities rises, individuals have to consume extra on purchasing which declines the amount of domestic saving which reveals negative trend. According to (Kazmi, 1993) that there exists a negative connection among inflation and domestic saving.

4.0 RESULTS AND DISCUSSION

In this section we have analyzed and interpreted our results. Descriptive Statistics, Hausman test, Fixed Effect Model, Chow Test and Breusch and Pagan Lagrangian Multiplier Test have been explained in detail in this section of the study which are given below as follows:-

DESCRIPTIVE STATISTICS

VARIABLES	OBS	MEAN	S.D	MIN	MAX
NS	396	24.12458	10.82634	-11.69198	50.15779
GDP	396	6.552594	2.453076	-12.12673	16.82582
ADR	396	55.81351	12.01578	34.49041	97.15256
BM	396	60.72837	37.25612	5.72303	207.2067
TR	396	11.32009	3.233958	3.894378	27.60997
INF	396	8.839888	16.22484	-17.10863	196.247

The above tables reveals descriptive statistics such as mean, standard deviation, minimum and maximum of national savings (NS), gross domestic product, age dependency ratio, broad money, tax revenue and inflation during the period from 1996 to 2017 of eighteen different Asian countries i.e Georgia, Nepal, India, Vietnam, Turkey, Cambodia, China, Pakistan, Iran, Mongolia, Malaysia, Russia, Bangladesh, Thailand, Indonesia, Philippines, Sri Lanka and Bhutan. According to the above table national saving has mean value of 24.12 % in national savings of the selected countries other variables such as gross domestic product, age dependency ratio, broad money, tax revenue and inflation 5.55, 55.8, 60.7, 11.3 and 8.83 respectively while the minimum values of national savings, gross domestic product, age dependency ratio, broad money, tax revenue and inflation are -11.69, -12.12, 34.4, 5.72, 3.89 and -17.1 respectively. The maximum values of national saving, gross domestic product, age dependency ratio, broad money, tax revenue and inflation are 50.15, 16.8, 97.1, 207.6, 27.6 and 196.2 respectively.

CORRELATION MATRIX

Variables	GDS	GDP	ADR	BM	TR	INF
NS	1.0000					
GDP	0.1303	1.0000				
ADR	-0.4252	-0.0317	1.0000			
BM	0.4869	0.1004	-0.5280	1.0000		
TR	-0.0275	-0.0216	-0.4407	0.1380	1.0000	
INF	-0.0731	-0.2367	-0.0029	-0.2626	-0.0410	1.0000

The above table reveals the correlation matrix of dependent and independent variables for Russia, Bangladesh, Thailand, Indonesia, Philippines, Georgia, Nepal, India, Vietnam, China, Pakistan, Iran, Mongolia, Malaysia, Turkey, Cambodia, Sri Lanka and Bhutan for the period from 1996 to 2017. National savings have positive correlation with gross domestic product and broad money, but have negative correlation with age dependency ratio, Tax revenue and inflation.

CHOW TEST

S.No	Variables
1	GDP = 0
2	ADR = 0
3	BM = 0
4	TR = 0
5	INF = 0
Chi2 (5) = 85.48	
Prob> chi2= 0.0000	

The above table shows result of chow test. This table was used for the selection purpose of fixed effect model and Pooled OLS Model. P Value of chow test indicates that P value is less than 0.05 so we reject null hypothesis because fixed effects model is more suitable than pooled regression model.

BREUSCH AND PAGAN LAGRANGIAN MULTIPLIER TEST

	Var	SD = sqrt (Var)
NS	141.1375	12.93634
E	21.4322	5.4202
U	52.78923	8.189522
Var(u) = 0		
Chibar^2 (01) = 1404.47		
Prob > Chibar^2 = 0.0000		

The above table indicates variation and standard deviation of gross domestic saving. The variation and SD of national savings (NS) was 141.13 and 12.93 respectively. On the basis of p-value we reject null hypothesis which indicates that pooled OLS model is better than random effects model.

HAUSMAN TEST

Variables	Fixed Effect Prob.	Random Effect		Var(Diff.)
GDP	0.272709	0.280152	0.000049	0.2876
ADR	-0.113456	-0.115012	0.000092	0.8712
BM	0.043232	0.055705	0.000045	0.0622
TR	0.063976	0.024447	0.000286	0.0195
INF	-0.030807	-0.029327	0.000001	0.1477

Test Summary	Chi-Sq Statistic	Chi-Sq. d.f	Prob.
Cross-section	17.774442	5	0.0046

The above table reveals the results of the Hausman specification test. This test was used for the purpose of selecting whether to use fixed effect model or random effect model. The p-value of chi^2 is .0047 which is less than .05. Under this assumption fixed effect model is more efficient than random effect model.

FIXED EFFECT MODEL

Dependent variable: NS

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
Const	26.92347	3.379058	7.967746	0.001
GDP	0.272709	0.074310	3.669874	0.003
ADR	-0.113456	0.038076	-2.979726	0.031

BM	0.043232	0.019286	2.241646	0.025
TR	0.063976	0.090891	0.703879	0.481
INF	-0.030807	0.015350	-2.006939	0.045
R-squared	0.864352	Adjusted R-squared		0.856352
F Statistic	108.0349	P-value (F)		0.00000

In the above table, results of the fixed effects model are presented. It can be observed that gross domestic product, age dependency ratio, broad money and inflation were statistically significant because the P value of these variables are less than 0.05 i.e. 0.003, 0.031, 0.025 and 0.045 respectively. The value of R-squared shows that independent variables explains 86 % of the entire panel's variation. The coefficient of fixed effect model shows that gross domestic product, broad money and tax revenue have positive effect on national savings while age dependency ratio and inflation, have negative effect on national savings.

5.0 CONCLUSIONS & RECOMMENDATIONS

This research study titled as " how different elements effect the rate of national savings " was aimed to examine the important factors of national savings such as gross domestic product, age dependency ratio, broad money, tax revenue and inflation from the year 1996 to 2017. This research study was mainly based on secondary data compiled from "websites of World Bank". Elements which effect national savings such as gross domestic product, age dependency ratio, broad money and inflation were statistically significant. The coefficient of fixed effect model shows that gross domestic product, broad money and tax revenue have positive effect on national savings while age dependency ratio and inflation, have negative effect on national savings.

Recommendations:-

It is suggested that in future research scholars may use primary data for research studies on the topic of National savings because the primary data will depict accurate impact of the determinants on national saving in different Countries of the world. Maximum independent variables will generate more valuable and accurate reports which may improve understanding on the subject as well as quality of future research studies.

Proper policies may be framed and adopt for financial institutions by the selected countries in the study for the purpose to achieve main goal of economic growth, capital formation. On the other hand Policies of income effect and prices effect should be presented and adopted for constructive changes in behavior of saving.

Governments of these countries may also adopt effective monetary and fiscal policies for stimulating investment, encourage saving and increase production in order to achieve the goal of economic growth.

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