



## Factors Affecting the Rate of Gross Domestic Saving in Different Countries

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### **Abstract:**

*In this research paper we have investigated factors that affect the rate of gross domestic saving in Pakistan, China, Singapore, Japan Turkey and Russia. These countries were selected, based on the availability of data from the year 1995-2016. Secondary panel data of the factors affecting the rate of gross domestic saving of the selected countries were obtained from the website of World Bank. Different statistical techniques such as descriptive statistics, correlation matrix and fixed effects model were employed in this research study. The results of the secondary data revealed that age dependency ratio, money supply growth ( $M2$ ), gross domestic product and per capita income have statistically significant effect on the gross domestic saving while foreign direct investment and inflation have non-significant affect on gross domestic saving. Money supply growth ( $M2$ ), gross domestic product and per capita income have positive effect on gross domestic saving while foreign direct investment, age dependency ratio and inflation, have negative effect on gross domestic saving. Based on the results, it is recommended that Governments of these countries may adopt proper policies for stimulating investment, encourage saving and increase production in order to achieve the goal of economic growth.*

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**Key words:** Domestic saving, inflation, foreign direct investment, per capita income, gross domestic product, Money Supply growth (M2), age dependency ratio.

## INTRODUCTION

Domestic Saving plays a noteworthy role in the economic growth of country. Saving is an important factor which finance investment, creates job opportunities and improve the level of productivity in a country. Therefore, it would be vital to look at the factors which affect the level of domestic saving and improve the economic growth. Domestic saving offers an important association between past, present and future economic growth (**Kazmi, 1993**). Domestic Saving is Gross Domestic Product minus final consumption expenditure. The savings of public sector, private corporate sector and household sector in a country is called gross domestic saving. Domestic saving helps in maintaining high growth rates through its effect on the capital formation and investment. It also acts as a channel for attracting foreign investors or it improves the level of Foreign Direct Investment. Strong reliance on external financing may erode competitiveness through an overvalued currency, providing additional motives for wanting to stimulate domestic saving. The OIC member countries saved 28 percent of their Gross Domestic Product while the average is rate is 18.9% in the world and 17.0% in developed countries. Capital formation is a function of domestic savings. According to (**Nga, 2007**) domestic saving plays a vital and collective role for the sustainability and growth of an economy because it encourages investment, eliminates poverty and creates 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 domestic 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 domestic 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. The domestic saving rates in many Asian countries have been weakened. However as per the economic concepts 22-25 % of Domestic saving rate is essential for financial development of an economy. **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 the gross domestic saving of different countries i.e. Pakistan, Turkey, Singapore, Japan, Russia and China. This study has employed secondary data regarding factors affecting the rate of gross domestic saving of the selected countries in the research. The data was collected for period of 1995-2016. Literature review related to all dependent and independent variables of study was compiled from published research papers and research reports of

different research journals etc. The current research has focused Gross Domestic saving, inflation, per capita income, foreign direct investment, gross domestic product, money supply growth and age dependency ratio.

Importance of this study arises due to significant role of gross domestic saving in growth of a nation's economy. Saving has provided important services for individuals of any state. The research study has examined the impact of key elements of gross domestic saving. The present research has used sufficient logical outline of gross domestic saving of Pakistan, China, Russia, Turkey, Singapore and Japan. This research work has examined the independent variables as base in several other research studies of similar area of research. This study has provided comprehensive framework and published literature regarding factors affecting gross domestic saving. The current study has identified the effect of foreign direct investment, inflation, per capita income, gross domestic product, money supply growth, age dependency ratio and other non-identified variables of gross domestic saving of the selected countries. This study has evaluated the factors which have provided a ground for further studies on the role of determinants in term of gross domestic saving.

The importance of gross domestic saving 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. In this study, data regarding elements which affect the rate of domestic saving in the selected countries i.e. Pakistan, Russia, China, Japan, Singapore and Turkey was compiled from secondary sources (Websites of World Bank). The effect of independent variables on dependent variable (Gross domestic saving) was evaluated and analyzed.

Domestic saving has received importance and attention from economists (i.e. research community and academic) due to its important role in economic development. Previously

research studies have been conducted by **Jappelli et al. (1994); Blomstrom et al. (1996); Gavin et al. (1997) . Sinha et al. (1998)** and **Weller et al. (2010)** on this topic of research. However previous studies have emphasized on domestic saving of one country or countries chosen from other different regions of the world. 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 six countries i.e. China, Pakistan, Turkey, Japan, Singapore and Russia.

## **THEORETICAL BACKGROUND**

### **The Life-Cycle Hypothesis (LCH)**

This theory was developed by Franco Modigliani and his student in the year 1950. Richard Brumberg, developed a theory which was based on the observations that the consumption decision of the many people mainly depends on their available assets over their lifetime, and on their current life stage. Brumberg and Modigliani observed that people make up different kinds of assets at the initial stages of their working lives and use it after their retirements. Most of The working people save up for their retirement lives and change their consumption behavior according to their basic needs at different stages of their lives.

#### **1.2.2. Relative Income Hypothesis**

The Theory of relative income hypothesis was developed by James Duesenberry. This theory states that the behavior saving and consumption behavior of the people depends on their income level in relation to others than by abstract standard of living. The percentage of resources consumed by a person mainly depends on his percentile position within the income or resources distribution.

### **1.2.3. The Permanent Income Hypothesis**

It is an economics theory which explains that how an agent extends utilization of resources over his lifetime. This theory was developed by Milton Friedman, it supposes that a consumption of a person at a point in time is determined not just by their available resources but it also depends on their expected future permanent income. In other words this theory states that changes in permanent income, rather than changes in temporary income, are what drive the changes in a consumer's consumption patterns. Its predictions of consumption smoothing, where people spread out transitory changes in income over time, departs from the traditional Keynesian emphasis on the marginal propensity to consume. It has had a profound effect on the study of consumer behavior, and provides an explanation for some of the failures of Keynesian demand management techniques.

## **LITERATURE REVIEW**

The elements which play dominant role in increasing domestic saving has at all times is a significant question for economists over the history. It is known fact that one element may not affect the rate of domestic saving. However, different elements together such as foreign direct investment, per capita income, inflation, age dependency ratio, gross domestic product & money supply growth rate of country, macroeconomic certainty level, financial liberalization, and economic policy will influence the rate of domestic saving. Published Literature is available on saving pattern; determinants of domestic saving of various countries of the world .Important published literature on domestic saving is summarized as under:

Mackinnon (1973) reported interest rates as a factor of National Savings. The relationship was not much obvious however, low interest rates has discouraged saving, while high

real interest rate has encouraged saving resulting in real interest rate which directly affect national saving. He revealed that growing rates of interest has enhanced savings which led to boost up of economic growth. Giovannini (1985) revealed insignificant relation between saving and interest rates. The influence on savings was mostly dependent on consumer's reactions to an upsurge in inflation. Chopra (1988) reported that high insecurity will encourage individuals to save large portion of their earnings as provision for upcoming monetary or fiscal problems instead.

Schemidht and Hebbel (1991) studied consumption function of thirteen nations to evaluate the impact of fiscal policy on their savings. They observed positive impact of fiscal policy on National Savings. Ogaki et al. (1995) conducted research and proved that people save more of their income if rate of interest is high. They concluded that interest rate and saving are positively related. They reported that savings depends on rate of interest, in terms of rate of return at elevated levels of income. Deaton A. and C. Paxson. (1997) reported negative relation between per capita income and saving.z Basely et al. (1998) revealed that opposite income effect was dominated by positive alternatives causes and therefore savings rates has optimistic link or relationship with rate of interest. Masson et al. (1998) revealed that countries with high percentage or rate of working age population shows maximum rate of savings as compared to countries with minimum working age population rate. The connection or link among savings and interest rate was unclear because of a paradox it follows i.e. it shows an optimistic alternative for upcoming or expected expenditure and simultaneously it created opposite influence on income due to high yields on saved wealth.

Agarwal (2001) reported the savings pattern of seven Asian countries. He revealed dissimilarities in connection or link among rate of interest and rate of savings from country to country. In Taiwan, India and Malaysia, there was an optimistic connection among rate of savings and rate of interest but influence of the rate of interest over the savings rate was insignificant. Ozcan et al. (2003) concluded that saving of peoples was positively affected by income levels in Turkey. Positive relation between per capita income and savings was described by life cycle hypothesis.

**Metin-Ozcan, et al. (2003)** examined the empirical factors of private savings behavior in Turkey from 1968-1994 using the ordinary least squares (OLS) estimation techniques. They identified six different explanatory variables in their study including government policies proxied by public savings; 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.

**Narayan et al. (2005)** reported basic components of Oman's national savings, from the year 1977-2003 by means of bound testing approach and ARDL model. Aggregate saving was dependent variable in his study while domestic credit, rate of population, rate of per capita income, money supply rate, current account deficit and urbanization rate were independent variables in his research study. The results showed that domestic credit, current account deficit and urbanization rate has encouraged influence on rate of saving while urban population rates, money supply and rates of per capita income has negatively affected the savings rate of Oman.

**Narayan and Narayan (2006)** reported saving activities in Fiji during 1968-2000 via ARDL method to co-integration rectification model. In this research study dependent variable was aggregate saving while rate of interest, deficit of current account, and dependency ratio of age were independent variables. This research proposed that both on long term and short term basis, 1% increase in growing rate of per capita income enhanced the saving rate by 0.05 and 0.07%. Which showed constructive affect on the rate of saving. Rate of real interest and rate of age dependency ratio revealed synthesis consequences with saving.

**Vincelette (2006)** studied the saving factors of Pakistan. The research has compiled data for the year 1973-2005. He employed the method of OLS regression. Rate of saving was considered as dependent variable while, income of financial development, rate of interest, financial policy and factors of demography as independent variables. The results illustrated that there was negative and important connection among development of financial sector and aggregate saving. Direct inverse connection among economic or monetary imbalances and saving on the other hand income and demographic factors have major effect on rate of saving.

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 2<sup>nd</sup> 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 times 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.

Turner and Manturuk (2012) studied that how single, formal, and fundamental factors influence the procedures of decisions making which supported domestic savings in New York. The outcomes revealed the factors of single elements such as requirement of family, upbringing affect of individuals toward savings and their self-reliance in their capability to save. Formal elements allowances, disincentives, and structural values form households' trust in economic institutes and their readiness towards contributing in savings programs. **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.

## **RESEARCH METHODOLOGY**

### **Panel Data**

Panel data were used for econometric analysis in order to examine the important factors which affect the rate of gross domestic saving in Pakistan, Japan, China, Russia, Singapore and Turkey. With the features of heterogeneity, as compare to cross-sectional and time series regression, panel data technique has advantage over them. 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.

### **Fixed Effect Model**

It is the kind of Panel data. In this research study fixed effects model has used for the robustness in the result because it shows vigorous average errors where Heteroskedasticity is available in data. 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**

Random effect model has applied in this research study which is the most important type of panel data analysis. 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. Following are the core null hypothesis and substitute of the test which are given below.

- $H_0$ : Pooled OLS Model is higher than Random Effect model.
- $H_1$ : Pooled OLS Model is not higher than Random Effect model.

### **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.

$$\begin{aligned} GDS_{i,t} = & \beta_1 FDI_{i,t} + \beta_2 ADR_{i,t} + \beta_3 M2_{i,t} + \beta_4 GDP_{i,t} + \beta_5 INF_{i,t} \\ & + \beta_6 PCI2_{i,t} \end{aligned}$$

Where

$i$  is for country.

$t$  is for year

GDS: Growth of gross domestic saving

INF: inflation rate

PERCI: per capita income

GDP: Gross Domestic Product

M2: Money Supply Growth rate

ADR: Age Dependency Ratio

While,  $\alpha$ : constant  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$  and  $\beta_6$  are called the regression coefficients, and  $\varepsilon$  is the random error terms.

## DEPENDENT VARIABLE

### GROSS DOMESTIC SAVING

Gross domestic saving is the dependent variable of our study. The percentage or rate of gross domestic product (GDP) held by households in a country is called Gross Domestic Saving (GDS). 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

### FOREIGN DIRECT INVESTMENT

Foreign direct investment (FDI) is an investment made by a company or individual in one country in business interests in another country, in the form of either establishing business operations or acquiring business assets in the other country, such as ownership or controlling interest in a foreign company. Foreign direct investments are distinguished from portfolio investments in which an investor merely purchases equities of

foreign-based companies. The key feature of foreign direct investment is that it is an investment made that establishes either effective control of, or at least substantial influence over, the decision making of a foreign business

### **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.

### **MONEY SUPPLY GROWTH (M2)**

Currency in circulation and all reserve balances/deposits held by financial institutions i.e. public and commercial banks in a country is called money supply growth. It is the overall money held by a country in the form of liquid instruments for a specified time. The money supply can include balances held in checking and savings accounts, cash and coins. **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.

## 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 domestic saving. According to Maddison (1992) and Bosworth (1993) GDP has constructive relationship with the rate of saving and economic growth.

## 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.

## PER CAPITA INCOME:

All resources of a country divided by the total population of that country is called per Capita Income. The life cycle hypothesis describes the positive relation between per capita income and savings. Generally, saving is generated from incomes. Income increases and savings subsequently increase if expenses decrease or remain constant.

## RESULTS AND DISCUSSION

### Descriptive Statistics

VARIABLES	OBS	MEAN	S.D	MIN	MAX
GDS	132	31.98	10.89	16.88	53.46
FDI	132	4.27	6.44	-.05	26.526
ADR	132	50.66	13.43	35.59	87.55
M2	132	19.61	22.86	-17.23	116.53
GDP	132	4.56	4.29	-7.82	15.24
INF	132	11.71	24.59	-1.40	197.47
Log PCI	132	3.81	.65	2.66	4.75

The above tables reveals descriptive statistics such as mean, standard deviation, minimum and maximum of gross domestics savings (GDS), Foreign Direct investment, age dependency ration , money supply growth rate, gross domestic product, inflation and per capita income during the period from 1995 to 2016 of six different countries i.e Pakistan, China, Japan, Singapore, Turkey and Russia . According to the above table gross domestics saving has mean value of 31.98 % in gross domestic saving of the selected countries other variables such as foreign direct investment, age dependency ratio, money supply growth rate, gross domestic product, inflation and per capital income have mean values of 4.27,50.66,19.61,4.56,11.71 and 3.81 respectively while the minimum values of gross domestics saving, foreign direct investment, age dependency ratio, money supply growth rate, gross domestic product, inflation and per capital income is 16.88,-.05,35.59,-17.23,-7.82,-1.40 and 2.66 respectively. The maximum of gross domestic savings (GDS), gross domestics saving, foreign direct investment, age dependency ratio, money supply growth rate, gross domestic product, inflation and per capital is 53.46, 26.52,87.55,116.53,15.24,197.47 and 4.75 respectively.

### Correlation Matrix

Variables	GDS	IFL	PCI	TR	GDP	IR	MSG	ADR
GDS	1.0000							
FDI	0.6429	1.0000						
ADR	-0.7127	-0.4618	1.0000					
M2	-0.2228	-0.2010	0.21042	1.0000				
GDP	0.4502	0.2275	-0.2078	0.0176	1.0000			
INF	-0.2880	-0.2046	0.1419	0.8418	-0.1592	1.0000		
Log PCI	0.2944	0.4016	-0.5612	-0.3427	-0.2340	-0.2348	1.0000	

The above table reveals the correlation matrix of dependent and independent variables for Pakistan, China, Japan, Singapore, Turkey and Russia for the period from 1995 to 2016. Gross domestic savings have positive correlation with foreign direct investment, gross domestic product and per capita income, but

have negative correlation with age dependency ratio, money supply growth and inflation.

### Chow Test

S.No	Variables
1	FDI = 0
2	ADR = 0
3	M2 = 0
4	GDP = 0
5	INF = 0
6	MSG = 0
7	PCI = 0
Chi2 (6)=335.66	
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. It gives details now if model is according to the nature of data. 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)
GDS	118.6062	10.89065
E	9.302172	3.049946
U	0	0
Var(u) =	0	
Chibar <sup>2</sup> (01) =	0.00	
Prob > Chibar <sup>2</sup> =	1.0000	

The above table indicates variation and standard deviation of gross domestic saving. The variation and SD of gross domestic saving (GDS) was 118.6062 and 10.89065 respectively. On the basis of p-value we reject null hypothesis which indicates that pooled OLS model is better than random effects model. We conclude that random effect model is suitable.

### Hausman Test

	Coefficients		(b-B) Difference	Sqrt(diag(V_b-V_B)) S.E
	(b) Fixed Effect	(B) Random Effect		
FDI	-.1427075	.6252134	-.7679209	.0562717
ADR	-.2269203	-.4788468	.2519265	.0420242
M2	.0624014	-.0586458	.1210472	
GDP	.3662437	.4927319	-.1264881	
INF	-.0078913	-.0172115	.0093202	
PCI	3.758212	-3.18516	6.943372	.900815

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 373.33
Prob>chi2 = 0.0000

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, which can provide efficient results. The p-value of  $\chi^2$  is .0000 which is less than .05. Under this assumption fixed effect model is more efficient than random effect model. We reject null hypothesis under this assumption because fixed effect model is more efficient than random effect model.

### FIXED EFFECT MODEL

Dependent variable: GDS

	Coefficient	Std. Error	t-ratio	p-value
Const	26.95678	0.149526	3.31	0.001
FDI	-.1427075	.1096948	-1.30	0.196
ADR	-.2269203	.0669802	-3.39	0.001
M2	.0624014	.0253359	2.46	0.015
GDP	.3662437	.0830126	4.41	0.000
INF	-.0078913	.0214138	-0.37	0.713
PCI	3.758212	1.463031	2.57	0.011

R-squared	0.3561	Adjusted R-squared	0.3601
F(12, 131)	66.65	P-value(F)	0.00000

In the above table results of the fixed effects model are presented. It can be observed that age dependency ratio, money supply growth (M2), Gross Domestic Product and per capita income were statistically significant because the P value of these variables are less than 0.05 i.e. 0.001, 0.015, 0.000 and 0.011 respectively. The value of R-squared shows that independent variables explains .35 % of the entire panel's variation. The coefficient of fixed effect model shows that Money supply growth (M2),Gross Domestic Product and per Capita income have positive effect on gross domestic saving while Foreign Direct Investment, age dependency ratio and inflation, have negative effect on gross domestic savings.

Foreign direct investment has negative effect on gross domestic savings and having statistical insignificant value. FDI inflow might have negative effect on economic growth in developing countries by replacing savings (Chung et al. 1995). The linkage between savings and FDI has been highlighted by Chung et al. (1995) and supported the fact that FDI raises domestic savings. Similarly, Bashier et al. (2007) investigated relationship between FDI & savings and found cointegration between both variables. Furthermore it is concluded that FDI is complementary for national savings in the case of Jordan. Recently, Shahbaz et al. (2008) also find that foreign direct investment and domestic savings are complementary in case of Pakistan.

Age dependency ratio are statistically significant and coefficient of age dependency also show negative effect on gross domestic saving. Results of age dependency are same to the results of Masson *et.al.* Masson et.al (1998) concluded that the countries which have high ratio of working age population present high savings rate as compared to countries which have low ratio of working age population. As concluded from these studies countries like China are experiencing increasing savings rate as their young dependency population is

increasing. They indicated positive and significant relationship among age dependency and saving in China.

Money supply was statistically significant. Result of money supply was same to the results of Joshi. Joshi (2007) conducted investigation on the domestic savings, capital account of the balance of payment. He used explanatory variables for the study of capital formation. The long run steady state relationship between various component of saving capital account balance and gross domestic capital formation was estimated. It was pointed out that money supply increase the capital formation and growth in economy and lead to saving. Joshi (2007) revealed significant relationship among saving and money supply.

Gross Domestic Product is statistically significant and coefficient of Gross Domestic Product shows positive effect on gross domestic savings. Results of gross domestic product are same to the results of the Mckinnon (1973) and Shaw (1973) they revealed that increase in the interest rate of savings boost up gross domestic product. Our results verify the results of Agarwal (2001), he analyzed the savings behavior of seven Asian countries. He concluded that most of the countries have shown significant impact of Gross Domestic Product on savings. Inflation has negative effect on gross domestic savings and having statistical significant value. Our result of inflation is similar with the results of Muradoglu et al. Muradoglu et al (1996) aimed at examining the differences in household savings behavior in developing and industrial countries from a cross-country perspective. The purpose of their study was to learn more about differences in nature of the household savings behavior in industrial versus developing countries. Income, wealth, rate of returns, inflation, foreign savings, and demographic variables were taken as the determinants of savings. Their results indicated that inflation has significant relationship with savings.

Per capita income has significant relationship with gross domestic savings and the value of coefficient of per capita income show positive effect on gross domestic savings. Our result of per capita income is similar with the results of Hasnain et al. Hasnain et al. (2006) evaluated the determinants of household savings in the process of economic development in the light of Pakistan's experience during the period 1972-2003. They used data arranged by State Bank of Pakistan, Economic Survey of Pakistan, and World Development Series during the years 1980-2003. Johansen Multiple Co-integration and Error Correction Model were utilized to estimate long run and short run relationships. The study revealed that growth rate, per capita income, and interest rate were positively affecting; young dependency ratio, old dependency ratio and inflation rate were negatively influencing public savings in long and short term. Error Correction term was found -0.05 suggesting that model would be converged towards long run equilibrium by taking 5% adjustment annually.

## CONCLUSIONS

This research study “factors effecting the rate of gross domestic saving in different countries was aimed to examine the important factors of domestic saving such as foreign direct investment, inflation, per capita income, GDP, money supply growth and age dependency ratio for the period from 1995 to 2016. This research study was mainly based on secondary data compiled from “websites of World Bank”. Factors of gross domestic saving such as age dependency ratio, money supply growth (M2), Gross Domestic Product and per capita income were statistically significant. The coefficient of fixed effect model shows that Money supply growth (M2), Gross Domestic Product and per Capita income have positive effect on gross

domestic saving while Foreign Direct Investment, age dependency ratio and inflation, have negative effect on gross domestic savings.

## **RECOMMENDATIONS**

Based on outcome of this study, the major recommendations are presented as under:

It is suggested that in future research scholars may use primary data for research studies on the topic of domestic saving because the primary data will depict accurate impact of the determinants on gross domestic saving in different Countries. 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 different kinds of policies for stimulating investment, encourage saving and increase production in order to achieve the goal of economic growth.

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