



INVESTIGATING A CAUSAL RELATIONSHIP BETWEEN GROSS DOMESTIC SAVING AND GROSS DOMESTIC INVESTMENT- A MACRO ECONOMIC ANALYSIS

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Abstract

In the mainstream macroeconomic framework there is one presumption of Saving- Investment parity. It has been found that there is a very significant correlation between Gross Domestic Saving(G.D.S) and Gross Domestic Investment (G.D.I.) and this in turn create positive externalities in the economy in terms of raising the economic growth rate of the nation i.e., it enhances the GDP of a country, ceteris paribus. This paper primarily examines the interlinkages of Gross Domestic Saving (GDS) and Gross Domestic Investment (GDI) of India. The dataset for the current exercise is from 1951 to 2012 for the country. From this study we can conclude that there is a very strong correlation between these two macro economic variables for India.

Key Words: Gross Domestic Savings & Gross Domestic Investment.

Contextual Framework

For the economic development of any country macro economic variables plays a very important role. Consumption, Saving and Investment plays a central role in a nation's economic performance. The country which saves and invests their large fraction of incomes tends to have rapid growth of output, income and wages. This kind of pattern was characterised in United States of America (U.S.A.) in 19th century, Japan in 20th century and in the *Miracle* economies of South East Asia in past three decades. And in contrast, the countries which fail to save or invest their income in large proportion particularly of South African or Latin American nations show low rates of growth of productivity and wages (Samuelson & Nordhaus, 2001).

Economic studies have shown that income is a primary determinant of consumption and saving. Rich nations save more than poor both absolutely and relatively. The poor nations are unable to save more of their financial resources and so as their capacity to invest falls which results into a low level of income. Empirically, if we analyse the data of GDS and GDI of India it is lower than many of the developing economies of the world. In 1950-51 the GDS and GDI of India was 6.9 percent and 7.0 percent respectively which has been grown to 30.6 percent and 29.7 percent in 2013-14, (New series estimates -2011-12) which is very low compare to other developed and some developing nations. The Average rate of GDS and GDI in India fluctuates in-between 30-35 percent for decades together. However, the investment activity, which is slowly picking up, needs to be grounded on a stronger footing. The savings-investment dynamics will be crucial for the growth to strengthen further in the coming years for Indian economy. In past some years the key will be the response of savings to improved price and financial market stability, and of investment, particularly in the crucial infrastructure sector of India, to reform efforts of the Government that are underway.(GoI, 2014) Now let us turn to the methodological part of this study.

Research Methodology

The basic objective of this study is to investigate the parity between the two macro economic variables viz., Gross Domestic Saving (GDS) and Gross Domestic Investment (GDI). The research approach is based on the secondary data on GDS and GDI published by Reserve Bank of India (RBI). The dataset for the current exercise is from 1951 to 2012 for India. The simple regression method is the statistical tool used to establish the functional relationship between GDS and GDI by taking study variable as GDI and explanatory variable as GDS. The following regression model would be estimated using the data in hand.

$$GDI = \alpha + \beta * GDS$$

Where, GDI = Gross Domestic Investment, GDS = Gross Domestic Saving , α = Constant ,

β = Regression coefficient

Hypothesis

Ho1: The Correlation between GDS and GDI is statistically insignificant.

H11: The Correlation between GDS and GDI is statistically significant.

Ho2: The regression coefficient of GDI on GDS is statistically insignificant.

H12: The regression coefficient of GDI on GDS is statistically significant.

Interpretations & Findings

Using the data of GDS and GDI the following findings were observed:



(1.) The descriptive analysis on GDS and GDI suggests that the mean and median of both the variables are almost the same with nearly same range of variation i.e, nearly 10.5 which can be visualised from the following table-1.

Table-1 Descriptive

Description		Statistic	Std. Error
GDS	Mean	10.4411	0.31011
	95 % Confidence Interval For Mean	Lower Bound 9.8210 Upper Bound 11.0612	
	5% Trimmed Mean	10.4085	
	Median	10.2600	
	Variance	5.962	
	Standard Deviation	2.44178	
	Minimum	6.85	
	Maximum	14.75	
	Range	7.94	
	Interquartile Range	4.33	
	Skewness	0.139	0.304
	Kurtosis	-1.253	0.599
	GDI	Mean	10.5666
95 % Confidence Interval For Mean		Lower Bound 9.9465 Upper Bound 11.1867	
5% Trimmed Mean		10.5358	
Median		10.3800	
Variance		5.963	
Standard Deviation		2.44186	
Minimum		6.80	
Maximum		14.89	
Range		8.09	
Interquartile Range		4.28	
Skewness		0.154	0.304
Kurtosis		-1.226	0.599

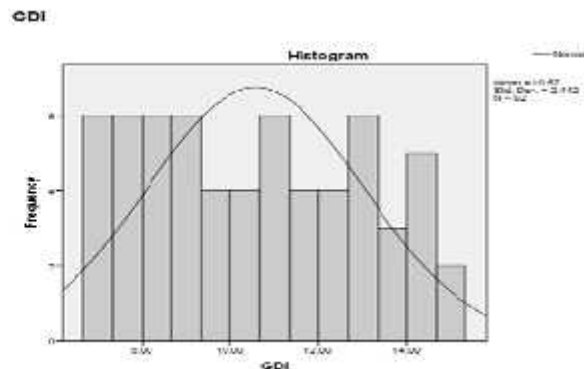
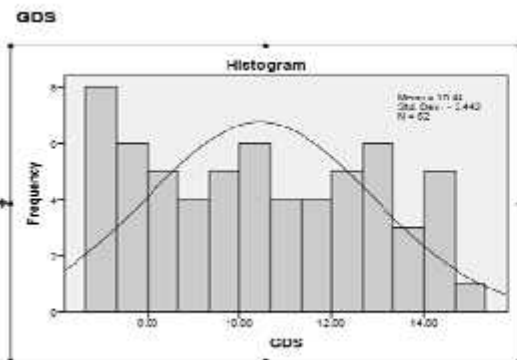
(2.) Before adopting regression approach the test of normality for the dataset under study conducted and the Kolmogorve-Smirnov Test carried out and suggested that the data is tending to be normal, which satisfies one of the prerequisite for carrying out regression analysis.

Table-2: Test of Normality for Dataset

	Komogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
GDS	0.096	62	0.200*	0.942	62	0.006
GDI	0.098	62	0.200*	0.947	62	0.009

Note: * This is a lower bound of the true significance.

a. Lilliefors Significance Correlation.





(3.) The Karl Pearson correlation coefficient between GDS and GDI is found to be 0.992 which suggest that there is a strong positive linear correlation between these two variables. Also this correlation found to be significant at 1 percent level of significance which fails to accept Ho1.

Table-3 : Correlations

Indicators		GDS	GDI
GDS	Pearson Correlation	1	0.992**
	Sig. (2-Tailed)		0.000
	N	62	62
GDI	Pearson Correlation	0.992**	1
	Sig. (2-Tailed)	0.000	
	N	62	62

Note: ** Correlation is significant at the 0.01 level (2-tailed)

(4) This is also one of the prerequisite for regression analysis. Hence after confirming the normality, linearity of the dataset the regression analysis was carried out which yields the following outputs-

- The model summary of regression analysis suggests that the value of R^2 was found to be 0.984 (which is tending nearly to 1) with Standard Deviation (SD) of the estimate .30784 (which is tending nearly to Zero). From this we can infer that almost 98.4 percentage of the variation in GDI is due to GDS.
- The regression coefficient 0.992 turns out to be statistically significant which suggest that with one unit change in GDS there is 0.992 unit change in GDI. In other words, From the estimated model this can also be said that with one unit increase in GDS there is a corresponding .992 unit increase of GDI.
- The coefficient table suggest that the constant term (α) is found to be statistically insignificant suggesting that autonomous investment has no role to play in the model.
- The regression analysis gives the following estimated model of regression equation of GDI on GDS.

$$GDI = 0.207 + 0.992 * GDS$$

Table-4: Regression Analysis : Variables Entered/ Removed^a

Model	Variables Entered	Variables Removed	Method
1	GDS ^b	GDI	Enter

Note: a Dependent Variable : GDI , b All requested variables entered

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.992 ^a	0.984	0.984	0.30784	1.001

Note: a Predictors: (Constant), GDS, b Dependent variable :GDI

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	358.039	1	358.039	3778.148	0.000 ^b
Residual	5.686	60	0.095		
Total	363.725	61			

Note : a Dependent variable: GDI , b Predictors: (Constant) , GDS

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	0.207	0.173		1.197	0.236
GDS	0.992	0.016	0.992	61.467	0.000

Note : Dependent Variable : GDI



In addition, GDI does not follow “*partly fixed and partly varying*” kind of pattern. Precisely the study in hand reveals that GDI varies as GDS. The ANOVA model of the regression analysis confirms the overall significance of the model.

Conclusion

While analysing the dataset of savings and investments for India from 1951 to 2012 for 62 years, we can conclude that there is a very strong positive linear correlation between GDS and GDI. Hence in the economic literature and in the present study the presumption of parity between Saving and Investment seems to be correct. This kind of parity in the countries like India would be helpful for raising their economic growth. Thus, the study examines the direct relationship between saving and investment in India context.

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