

DOMESTIC SAVINGS AND ECONOMIC GROWTH IN INDIA

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***Abstract:** A brief look at the prime macroeconomic variables affecting economic growth in the country confirms the key role of the Gross Domestic Savings in the process. This paper is an attempt to study the causal relationship between domestic saving and economic growth and the overall trend in gross domestic savings over the course of planned development in India. The empirical study confirms the existence of bi-directional granger causality between domestic savings rate and GDP growth for India.*

1. INTRODUCTION

The process of building a truly economically independent India through planned economic development began with the establishment of the Planning Commission in March, 1950. The Planning Commission of India developed, executed and monitored the Five Year Plans (FYP) which were centralized and integrated national economic programs. Still plagued by the paranoia of its colonial experience India reluctant to open up its economy this early, hoped to achieve economic growth in a closed setup and launched its first Five Year Plan in 1951 based on the Harrod-Domar Model. The Harrod-Domar model suggests that for stability and full employment, the ratio of saving rate to capital output must always equal the natural growth rate of the economy; in other words domestic savings rate has a critical role to play in the economic growth process. Increasing aggregate savings contributes to higher investment which leads to growth in aggregate wealth and thus a higher GDP growth. Similarly Solow model too supports this hypothesis of a positive relationship between savings rate and economic growth though it argues that this relationship is temporary in nature that is an increase in the savings rate has no effect on the steady state growth of output per worker and only increases the growth rate of output per worker in the transition stage as the economy moves from the old steady state to a new one.

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On the other hand the Endogenous growth theories suggest that a higher rate of savings can indeed have a permanent positive effect on output growth as a result of higher rate of accumulation of physical capital that leads to permanently higher rate of progress at the technological level (Romer, 1986, 1887; Lucas, 1988). All these theories postulate this positive relation between savings rate and economic growth under the conditions of no mobility of capital between the domestic economy and the outside world. Some studies including that by the World Bank (1993) have found evidence of this hypothesised positive growth effect of the savings rate while other authors as Singh (2009) have pointed out the existence of bi-directional causality between savings rate and income growth.

Given this, a high savings rate may also have a taxing effect on an economy with less developed financial markets by depressing the investment demand. Due to the less variety and small scale of the financial market, banks will have limited ways to utilize the large amount of savings besides providing loans. It would be hard for the saving to be efficiently transferred into investment. In addition, excessive saving will slow down the growth in consumption. This will further slowdown the improvement of people's living standards and thus the sustainability of the economic development.

This study is an attempt to empirically examine the effect of Gross domestic savings on economic growth of the country and the effect of GDP growth on domestic savings. The second section gives a review of literature on the subject followed by the third section which looks at the trends in Gross domestic savings over the various five year plans beginning with the 3rd FYP. The fourth section gives a brief on the empirical methodology being used for the study and the fifth section gives the interpretation of the results followed by the conclusion.

2. LITERATURE REVIEW

Jappelli and Pagano in 1994 conducted an empirical research on savings, growth and liquidity constraints by performing the regression analysis for 22 OECD countries for the period 1960-1987 and found that a higher saving rate induced by liquidity constraints led to higher economic growth.

Aghion *et al.* in 2006 argued in their study that high domestic savings in the relatively poor countries could be more helpful to their economic growth than that in the relatively rich countries. In the poor countries foreign investment is needed in order to transfer the frontier technological knowledge to the local innovating sectors. The local banks could co-finance the projects to attract foreign investment. However in the rich countries local enterprises do not need to attract foreign investment for innovation projects. Therefore local savings do not have much effect on the economic growth.

Saltz in 1999 found Granger causality between saving and economic growth in 17 developing countries. He found that 4 countries have causal relationship from saving to the real GDP while 10 countries have the reverse causal relationship from economic growth to saving growth.

Ramesh Mohan in 2006 addressed the relationship between domestic savings and economic growth for various economies with different income levels. He divided the countries into low-income (LIC), lower-middle income (LMC), upper-middle income (UMC) and high-income (HIC) countries in order to test whether the income levels have played any important role in influencing the direction of causality. The results suggested that the economic growth Granger causes growth rate of saving in 13 countries and that the income class of a country plays an important role in determining the direction of causality. In the LICs the directions were mixed. In most LMCs, the causality ran from economic growth to savings growth. In all the HICs except Singapore, the causality was from economic growth to growth of saving. However, it appeared that in the UMCs, bi-directional causality was more prevalent.

3. THE FIVE YEAR PLANS AND GROSS DOMESTIC SAVINGS



^ The red lines mark the beginning of a new Five Year Plan. The green lines indicate the three Annual Plans (1966-69). The purple line marks the Rolling Plan (1978-80).

India's Gross Domestic Savings have exhibited an upward trend since the 1950s on a whole, save some intermittent sharp escalations the most pronounced being over the period 2002 to 2007. Following a decade of wide ranging structural and economic reforms and financial liberalization under Prime Minister P. V. Narasimha Rao in response to the worsening Balance of Payments (1990-91) crisis, rising debt burden, widening budget deficit, recession in industry and a rising inflation wrought by the unsustainable macroeconomic policies of the past decade. Though India recorded better growth rates throughout the 1980s, especially in the latter half it was at the expense of bitter fiscal imbalances. India tried to attain its growth prospects by commercial and other external borrowings which the economy failed to sustain.

The reforms coupled with the enactment and implementation of fiscal responsibility legislation and an upsurge in capital inflows led to rapid improvements in the corporate sector performance marked by the sharp increase in the contribution of the private corporate sector towards the GDS from 2% of GDS in the 1980s to over 9% of GDS by 2008.

The drop in the following year 2008-09 can perhaps be attributed to the sharp decline in growth rate and increased financial market volatility brought about by the global financial crisis; however a quick recovery reinstated the GDS to its pre-crisis trend of growth facilitated by coordinated fiscal and monetary policy actions.

India's Average Savings Rates over the Five-Year Plans

<i>Five-Year Plan</i>	<i>Gross Domestic Savings Rate (per cent)</i>	<i>Average annual rate of change in the savings rate (percentage points)</i>
First Plan (1951-56)	9.2	
Second Plan (1956-61)	10.6	0.3
Third Plan (1961-66)	12.1	0.3
Fourth Plan (1969-74)	14.7	0.5
Fifth Plan (1974-79)	18.5	0.8
Sixth Plan (1980-85)	17.9	-0.1
Seventh Plan (1985-90)	20.0	0.4
Eighth Plan (1992-1997)	22.9	0.6
Ninth Plan (1997-2002)	23.6	0.1
Tenth Plan (2002-2007)	31.3	1.5
Eleventh Plan so far (2007-2011)	33.7	0.6

Source: Central Statistics Office

Over the Eighth to the Eleventh Plan, the 18 year period of the structural reforms process, the average rate of Gross Domestic Savings increased by around 14 percentage points. This was higher than the increase that occurred over the First to the Seventh Plans (40 years) of about 11 percentage points in the GDS rate. The maximum increase of around 8 percentage points in the average GDS rate occurred over the Tenth Plan from 23.6% to 31.3%.

4. METHODOLOGY

As a precursor to the granger causality test and since the data are time series in nature, the variables are tested for 'stationarity' by using the Augmented Dickey-Fuller (ADF) test under the null hypothesis $\gamma = 0$ that is the data is not stationary and needs to be differenced, against the alternative hypothesis of $\gamma < 0$. for the model:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_{it}$$

The Granger causality test helps in determining whether one time series is useful in forecasting another so if X causes Y, then changes in X should precede changes in Y. Thus on regressing Y against its lagged values, the addition of the lagged values of X as independent variables will contribute significantly to the explanatory power of the regression. Also Y does not help in predicting X. The reason is that if X helps to predict Y and Y helps to predict X, it is likely to suspect that one or more other variables are in fact causing both X and Y.

The test is conducted under the null hypothesis that X does not cause Y. Y is first regressed against lagged values of Y and the lagged values of X, and then, only against the lagged values of Y.

To test this hypothesis, we apply the F-test given by;

$$F = \frac{\left[\frac{RSSr - RSSur}{M} \right]}{\left[\frac{RSSur}{(N - K)} \right]}$$

This follows the F-distribution with (M) and (N-K) degrees of freedom. M is the number of lagged terms of X and K is the number of parameters being estimated in the restricted regression (without the lagged X values). If the F-statistic value is significant then the null hypothesis holds and X does not cause Y.

5. EMPIRICAL ANALYSIS

The ADF test indicates that both GDP growth and gross domestic savings rate do not have unit roots in the level data and are stationary while the rate of gross

capital formation does have a unit root in level data and needs to be differenced. Without differencing the series, the causality test would lead to misspecification.

Correlation Co-efficient Matrix between Gross domestic savings (% of GDP) and Other Variables at 5% significance (two-tailed)

	<i>Gross capital formation growth</i>	<i>GDP growth</i>	<i>Gross domestic savings (% of GDP)</i>	<i>Gross capital formation (% of GDP)*</i>
Gross capital formation growth	1.0000	0.4963	0.3033	0.8769
GDP growth		1.0000	0.4577	0.2246
Gross domestic savings (% of GDP)			1.0000	0.2257
Gross capital formation (% OF GDP)				1.0000

* indicates that the first difference of the variables have been taken.

From the correlation matrix above it is observed that both Gross capital formation growth (previously known as Gross domestic investment) and GDP growth show a significant positive correlation which is congruent with the economic theory. Further Gross domestic savings rate and GDP growth also show a significant positive correlation. When people abstain from current consumption, they make available a pool of funds from which firms and the government can borrow to invest in capital goods. This investment (net restitution investment) is what adds to the capacity for production of the economy and leads to economic growth.

Also there is a strong positive correlation between Gross capital formation rate and Gross capital formation growth as expected.

Adam Smith held that the rate of investment which is an important determinant of Economic growth is determined by the rate of savings in an economy. Thus savings form the backbone of economic growth.

A number of factors have contributed towards rapid growth and one of the most important of these has been the high Gross Domestic Savings rate which has been a major source of funds for investment to expand productive capacity in the days after independence when international capital flows were almost negligible and highly constrained. The Indian economic growth has been predominantly financed by domestic savings (Mohan, R. 2008). Hence domestic savings facilitated growth which in turn enabled savings to be ample.

Prior to its financial liberalization in the 1991-92, for the Indian economy, being a closed one, we expect from the point of view of a standard theory of economic growth, a positive cause and effect relation to exist between domestic savings and economic growth, in which the domestic savings may constitute an essential source

of financing domestic investment and an economic growth factor, in the absence of foreign investment. Thus we expect these variables to mutually reinforce each other.

Results of Pair-Wise Granger Causality Tests (at 5% significance)

<i>Null Hypothesis</i>	<i>F - Statistic</i>	<i>Significance</i>	<i>Inference</i>
GROSS DOMESTIC SAVINGS (% OF GDP) DOES NOT GRANGER CAUSE GDP GROWTH	11.429	0.0014	Gross domestic savings (% of GDP) Granger causes GDP growth.
GDP GROWTH DOES NOT GRANGER CAUSE GROSS DOMESTIC SAVINGS (% OF GDP)	7.9978	0.0067	GDP growth Granger causes Gross domestic savings (% of GDP).
GROSS DOMESTIC SAVINGS (% OF GDP) DOES NOT GRANGER CAUSE GROSS CAPITAL FORMATION (% OF GDP)	0.21201	0.6472	-
GROSS CAPITAL FORMATION (% OF GDP) DOES NOT GRANGER CAUSE GROSS DOMESTIC SAVINGS (% OF GDP)	6.5388	0.0136	GROSS CAPITAL FORMATION (% OF GDP) Granger causes Gross domestic savings (% of GDP).

The results of the pair-wise Granger test at 5% significance do show that bi-directional causality exists between GDP growth and Gross domestic savings rate which indicates that during the period under study (1961 to 2014) these variables mutually reinforced each other. These results not only bolster Dr. Rakesh Mohan’s observation that India’s economic growth since independence has been predominantly financed by domestic saving but also show that this economic growth has had a major influence on the domestic savings. A rise in GDP can be inferred as an increase in the incomes of the citizens leaving them at the luxury to afford higher savings.

The results further show that the rate of gross capital formation Granger causes the gross domestic savings rate. A higher rate of capital formation adds to the existing capital stock of the economy increasing its capacity for production in the future leading to economic growth which increases the incomes of the citizens who can then afford to save more.

6. CONCLUSION

The basic insights gained from this study can be summarised as follows:

- Gross domestic savings rate is positively correlated with GDP growth for India which is consistent with the economic growth theories.

- The research results also confirmed the existence of positive, bi-directional causal relationship between economic growth and savings rate. Namely, the growth of Gross Domestic Savings was the cause of the growth of Gross Domestic Product which in turn sustained the high savings rate.

Given this and the fact that India is increasingly opening up its economy with foreign investment flows being higher than ever though mostly speculative in nature, domestic savings are now at the forefront for sustaining the high growth of the Indian economy.

With household savings being the major contributor towards the gross domestic savings, the main objective of national economic policy should be to encourage the people to save. In addition, national economic authorities should create appropriate conditions for the reallocation of national resources from traditional (non-growth) sectors to the so-called modern (growth-led) sectors of the economy, stimulating economic growth (Patrick, 1966).

Key Terms

Gross domestic savings - Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption).

Gross capital formation - Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.

Inventories- are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and “work in progress.”

Foreign direct investment - Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments.

Gross Domestic Product - Gross Domestic Product is an estimated value of the total worth of a country’s production and services, within its boundary, by its nationals and foreigners, calculated over the course on one year.

Annexure

The ADF Test Results (at 5% significance)

NULL HYPOTHESIS	t - statistic	'p' VALUE
GDP GROWTH HAS A UNIT ROOT	-6.49465	0.007399
GROSS CAPITAL FORMATION (% OF GDP) HAS A UNIT ROOT	-2.78932	0.2074
D (GROSS CAPITAL FORMATION { % OF GDP}) HAS A UNIT ROOT	-9.78273	0.0000
GROSS DOMESTIC SAVINGS (% OF GDP) HAS A UNIT ROOT	-3.68376	0.03206

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