SAVING AND CAPITAL FORMATION IN INDIAN ECONOMY SINCE 1950-51: A DECOMPOSITE ANALYSIS

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Capital is defined in different ways. Its coverage varies with the interpretation of the nature and scope of the concept[1]. A unique definition of capital for understanding the nature of economic process itself is not possible since the nature of the economic process itself is not unique. We are always in multiperiod planning[2], which is subject to continuous changes and adjustments. A given thing is capital not by virtue of its physical properties but by the nature of the economic function it performs[3]. Capital is defined as a previously produced means of further production[4]. In the context of multiperiod planning it can be looked at as an interim result obtained from the earlier plans and means towards the attainment of still further production envisaged. It is, therefore, both a forward-looking and a backward-looking concept. From the point of view of the measurement of capital, these two require closer examination.

As a forward-looking measure, it indicates the magnitude of capital goods in regard to the anticipated streams of output that will flow from them; the present worth of a capital good is the discounted value of the expected stream of income accruing from it during its life-time.

A backward looking measure of capital goods involves measurement of the value of the forgone alternative uses of economic resources that have gone into its production. This would be the measure of the cost of capital formation or the cost of producing capital goods.

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Capital formation is changes in stocks consisting of the value of additions to stocks of all types of finished goods, semi-finished goods, live-stock (exclusive of those included in machinery and equipment) and raw materials, other than those for defence in the accounting period. Capital formation in terms of change in stock might take place in industries (including wholesale and retail shops), producers of government services, and producers of private non-profit services to households; change in stock of all types of goods with households ar excluded. Producers of government services keep stocks in two ways: (i) stocks of raw-materials, finished and semi-finished goods as producers of commodities and (ii) stocks which relate primarily to stocks of strategic materials, grains and other commodities of special importance to the nation.

While measuring gross domestic capital formation (GDCF), for the country as a whole, purchase and sale of non-reproducible tangible such as land, mineral deposits, timber, tracts, etc., cancel out. This is-also the case with regard to purchases and sales of old assets. These assets form, part of capital formation of the sectors of purchase, an equivalent negative capital formation of the sector of sale. However, dealer's margin, service charges' and other transfer costs in connection with purchases and sales of non-reproducible tangible assets, as indicated above, and old assets form part of fixed capital formation.

On the external side, net capital inflow, representing mainly imports-exports, includes even old goods. Internal growth of standing timber crops are not included in capital formation, for they are not counted in the estimation of the gross national product (GNP).

Construction, other than for defence, whether or not completed during the accounting year, forms part of fixed capital formation, irrespective of its ownership. Only those machinery and equipment which have been purchased for final use in respect of production by industries, producers of government services and producers of private non-profit services to households, form part of fixed capital formation. Finished and unfinished machinery and equipment, not purchased by users, form part of changes in stocks.

Estimates of capital formation can be built up by adopting a direct as well as an indirect approach to measurement. Direct approach implies estimation of capital

formation with the help of estimation of saving. Saving plus net capital inflow is equal to domestic capital formation. If the estimate of net capital inflow is positive, estimates of domestic capital formation will be larger than estimates of saving to the tune of net capital inflow and vice-versa.

Bringing out the More Important Changes in Capital Formation

The study aims at bringing out the more important changes in capital formation in the Indian economy over a period of 59 years from 1950-51 to 2009-10. Simple regression and multiple regression analysis has been used to compute the elasticities and the trends of GDCF. For the sake of simplicity we assume that capital formation depends on four socio-economic variables, viz., saving, income, population and net capital inflow. Thus, the regression function is:

C= f(s,y,P,Ki)

C = Capital formation

S = Savings

Y = Income

P = Population

Ki = net capital inflow.

and the regression equation is;

$C=a+bS+cY+dP+eKi$ …….. (1)

Log function is used for the computation of elasticities, and accordingly the regression equation will be

$\log C = a + b\log S + c\log Y + d\log P + e \log Ki$ ……(2)

To compute the regression coefficient, the study considers six decades separately. In the first five decades capital formation is the function of only three independent variables (except net capital inflow). The data-relating to net capital inflow is not available for the first five decades.

Regression co-efficients are shown in Table 1. It reveals that saving has a positive relationship to capital formation over the four decades taken separately and also as whole.

Table - 1

Estimated Relationship of Gross Domestic Capital Formation

Decade	Years	Regression Co-efficient	Regression Co-efficient	Regression Co-efficient	Reg.Co.	R^2
	1950-51 to 2009-10	.9428* (13.6153)	.0554* (3.2307)	-13.0868* (-6.1255)		.9992
First Decade	1950-51 to 1959-60	1.1328* (3.7652)	.0807 (1.0340½	-1.6065 (-0.2267)		.9344
Second Decade	1960-61 to 1969-70	1.0101* (3.2160)	-.308 (-.3796)	8.0325 (0.3833)		.9764
Third Decade	1970-71 to 1979-80	.8625* (2.6767)	.1022 (.6358)	-40.3273 (-.5340)		.9886
Fourth Decade	1980-81 to 1989-90	1.1600* (4.8675)	-.01316 (-.1317)	18.8599 (0.2198)		.9990
Fifth Decade	1990-91 to 1999-00	1.1800* (5.2672)	-.01611 (-.1613)	22.1185 (0.2919)		.9993
Sixth Decade	2000-01 to 2009-10	1.1915* (5.6617)	-.01821 (-.1821)	25.3211 (0.3115)		.9997
	1979-80 to 2009-10***	-9.1596 (-0.5971)	1.59.60** (2.0375)	-.1468 (-0.5798)	91.745 (0.5769)	.3988

Source: National Accounts Statistics Year, 2010 (New Series), 1993, Publication of CSO.

Nate: 1.*Denotes the value of regression co-efficient, co-efficient is significant at one per cent level of significance.

**Denotes the value of regression co-efficient, co-efficient is significant at five per cent level of significance.

2. Figures in parentheses denote the 'T' values.

3. For the period 1979 to 2009-10, besides these variables one more variable, i.e., capital inflow, has been added in the regression estimates of capital formation.

The values of regression co-efficients are statistically significant at one per cent level of significance. Income has a positive relation to capital formation over the period of 59 years, in the first decade and the third decade. The value of regression co- as a whole, is significant at one per cent level of significance. The second and fourth decades have negative relationships, not significant at any level of significance. Over the period, population too witnessed a negative relationship to capital formation, though significant at one per cent level of significance. In the first and third decades, the regression coefficient has negative values, but the values of regression co-efficient are positive in the second and fourth decades.

When we add the net capital inflow as an independent variable in the regression function, saving and population show a negative relation to gross domestic capital formation. Net capital inflow and income has a positive relation to capital formation, i.e., higher the net capital inflow and level of income the greater is the capital formation.

Table 2 reveals the elasticities of saving, income, population and net capital inflow. Saving has a positive percentage change to capital formation, during the period under study. The value of elasticity is .7919, and significant at one per cent level of significance, which implies that as saving increases, GDCF too increases. Decade-wise too saving has a positive relation to GDCF. The values of elasticities in all the decades (except the third) are significant at one per cent level of significance. Income has a positive relation to capital formation over the period of 59 years and decade-wise, except in the sixth decade. The values of elasticities are not significant at one per cent level of significance. The value of elasticity in the last decade is negatively significant at one per cent level of significance.

Table - 2

Estimated Relationship of Gross Domestic Capital Formation

Years	Regression Co-efficient	Regression Co-efficient	Regression Co-efficient	Reg.Co.	R^2
1950-51 to 2009-10	.7919* (6.0885)	.1050 (.8080)	.6416 (1.0255)		.9970
1950-51 to 1959-60	1.1668* (4.8976)	.7474 (1.2725)	-1.2481 (-.6667)		.9481
1960-61 to 1969-70	1.2002* (6.2122)	.5152 (1.3968)	-4.1136** (-2.0463)		.9926
1970-71 to 1979-80	.7297* (2.3439)	.1868 (.3604)	.5245 (.2835)		.9932
1980-81 to 1989-90	1.551* (6.7672)	-2.7305* (-2.7843)	13.5788* (2.8283)		.9713
1990-91 to 1999-00	1.1834* (5.2672)	-3.1611 (-.1613)	22.1185 (0.2999)		.9993
2000-01 to 2009-10	1.1915* (5.6617)	-.01821 (-3.1821)	25.3211 (0.3115)		.9997
	Log C=a + blog S+C log Y + d log P = e log Ki				
	b	c	D	e	R^2
1979-80 to 2009-10	1.3907 (2.3090)	-7.1224 (*1.9220)	17.7697** (2.0905)	-61.9014** (-2.0659)	.9860

Source: Nalianal, Accounts Statistics Year 2010, 1993. Publication of CSO.

I. * Indicates the co-efficient elasticities are significant at one per cent level of significance.

** Indicates the co-efficient elasticities are significant at five per cent level of significance.

2. Figures in parentheses denote the 'T' values.

Population has a positive relation to capital formation over the period and in the third and fourth decades. The value of elasticity in the fourth decade is significant at one per cent level of significance. The values of elasticities are negative in the first and second decades.

When there is an additional variable, i.e., net capital inflow, for which data is available only for 30 years (1979-80---2009-10), saving and population show a positive relation to capital formation. The values of elasticities are significant at five per cent level of significance.

Income and net capital inflow has a negative relation to capital formation. The value of elasticity is negatively significant at five per cent level of significance in the case of net capital inflow during the years that follow.

The aforesaid discussion of the trends in capital formation in the Indian economy reveals that on the whole among the four determinants of capital formation, population growth has been found to be negatively affecting capital formation. It calls the attention of the government to take strict measures to curb population growth. However, sub period-wise no concrete results came up, about the behaviour of these variables. Sometimes they positively contribute to capital formation and sometimes they bear a negative relationship. Even so, to speed up capital formation, we have to step up our saving rate and the rate of growth of our national income.

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