THEORETICAL IMPLICATIONS OF SAVING-INVESTMENT GAP IN MACROECONOMIC FRAMEWORK.
2.1. The concept of saving-investment gap is a macroeconomic concept and it is normally treated in macroeconomic framework. Throughout the whole literature of saving and investment in macroeconomics we come across two apparently irreconcilable statements (i) that saving and investment are not necessarily always equal resulting in a saving-investment gap and (ii) that saving and investment are always equal. Several attempts have, however, been made to reconcile these apparently opposite views.

The equality or divergence between saving and investment can be attributed to the different definitions given to these terms. In Keynes' (1936) words "Saving and Investment have been so defined that they are necessarily equal in amount, being, for the community as a whole, merely different aspects of the same thing. Several contemporary writers (including myself in my Treatise on Money) have, however, given special definitions of these terms on which they are not necessarily equal. Others have written on the assumption that they may be unequal without prefacing their discussion with any definitions at all". (P.74) He further writes, "So far as I know, everyone agrees in meaning by Saving the excess of income over what is spent on consumption. It would certainly be very inconvenient and misleading not to mean this. Nor is there any important difference of opinion as to what is meant by expenditure on consumption. Thus the differences of usage arise either out of definition of Investment or out of that of income." (Keynes, 1936, P. 74) The divergence between saving and investment in Keynes' earlier work Treatise on Money and
the equality between them in his subsequent work 'The General Theory of Employment Interest and Money' are due to different definitions of income employed there in.

2.2. Keynes' Treatise's Concept of Saving and Investment:

In his Treatise Keynes proposes to mean income identically by the three expressions: (i) the community's money income; (ii) the earnings of the factors of production; and (iii) the cost of production; and reserves the term profits for the difference between the costs of production of the current output and its actual sale-proceeds, so that profits are not part of community's income. The normal remuneration (normal profit) that the entrepreneurs should get for discharging their functions in production, is to be considered as their income and as such it is a part of the community's income. The difference between the actual remuneration of the entrepreneurs and their normal remuneration is, whether positive or negative, the profits. Here the term profits is actually used to mean windfall profits or abnormal profits. In the context of normal remuneration Keynes writes, "What is most appropriate and convenient definition partly depends on the nature of the enquiry on hand. For my present purpose I propose to define the "normal" remuneration of the entrepreneurs at any time as that rate of remuneration which, if they were open to make new bargains with all the factors of production at the currently prevailing rates of earnings, would leave them under no motive either to increase or to decrease their scale of operations." [Keynes, 1930, PP 124-125] The money-incomes of the individuals including the normal remuneration of the entrepreneurs is the community's normal income. The normal income differs from the actual income to the
extent that there are windfall or abnormal profits or losses of
the entrepreneurs. The difference between the money incomes of
individuals and their money expenditures on current consumption
is saving. Thus,

\[ S = Y - C \quad \ldots \ldots \quad (1) \]

Where \( Y \) is normal income, \( C \) is the current consumption
expenditure and \( S \) is the current savings.

The current investment \( I \) is defined in the same way
both in the General Theory and in the Treatise. The current
addition to the value of capital equipment which has resulted from
the productive activity of the period is the current investment,
or in other words the expenditure incurred to make an addition
to the stock of capital in a certain period is the investment of
that period. "It is measured by the net addition to wealth
whether in the form of fixed capital, working capital or liquid
capital." (Keynes, 1930, P. 172) We find that,

\[ Y = C + I \quad \ldots \ldots \quad (2) \]

Where \( Y \) is the actual income and \( I \) is the investment and \( C \)
is the current consumption. If there are profits to the
entrepreneurs, the actual income \( (Y) \) will exceed the normal
income \( (Y) \). If we assume the current consumption \( (C) \) to be
stable, then it is obvious from (1) and (2) that investment will
exceed \( S \). On the contrary, in the period of windfall losses the
investment in the current time period, out of the actual income
will fall short of current saving \( (S) \) out of the normal income.

It will be found that the value of current investment as
thus defined, will be equal to aggregate of savings and profits as defined above. Thus,

\[ I = S + Q \]

or \[ Q = I - S \] \hspace{1cm} (3)

Where \( Q \) implies total profit, \( I \) implies investment and \( S \) implies saving. From here it follows that investment exceeds saving by the amount of the excess of the actual profit over normal profit and conversely saving exceeds investment by the amount of the deficit of actual profit from the normal profit. In the words of Keynes, "Thus by the excess of saving over investment I meant that the scale of output was such that the entrepreneurs were earning a less than normal profit from their ownership of the capital equipment; and by an increased excess of saving over investment I meant that a decline was taking place in the actual profits, so that they would be under a motive to contract output." [Keynes, 1936, P.77] The expectation of an increase in investment over saving, given the former volume of employment and output, will induce entrepreneurs to increase the volume of employment and output. An expected increase in investment relatively to saving is a criterion of an increase in effective demand which is the substance of the General Theory of Employment.

Keynes demonstrates in Treatise with two equations known as "fundamental equations" how the gap between saving and investment may be one of the causes of disturbance in price-level. While one fundamental equation deals with the forces governing the price-level of consumption goods the other deals with the forces governing the price-level of output as a whole.
The first fundamental equation is:

\[ P = \frac{E}{O} + \frac{I' - S}{R} \quad \ldots \quad (4) \]

This equation shows that the price—level of consumption goods (P) is made up of two terms: (i) \( \frac{E}{O} \), i.e., per unit cost of production, and (ii) \( \frac{I' - S}{R} \) i.e., the ratio of the difference between cost of new investment (I') and savings to consumption goods. The second term would be zero if I' = S, positive if I'>S, and negative if I'<S.

The above equation establishes the fact that a change in the price of a unit of consumption good, may be caused by a change in one or two or all of the following three: (a) Unit cost of production (E/O); (b) the number of consumption units (R) and (C) the gap between I' and S (I' - S). It is also clear from the equation that the price-level of the goods which are consumed exceeds or falls short of their cost of production, according as the volume of savings falls short of or exceeds the cost of production of new investment. Hence, if the volume of savings exceeds the cost of investment, the producers of the goods which are being consumed make a loss; and if the cost of investment exceeds the volume of savings, they make a profit.

The second fundamental equation is:

\[ \pi = \frac{E + Q}{O} \quad \ldots \quad (5) \]

Where \( \pi \) is the price level of output as a whole; O is the level of output; E is the sum total of factor incomes.
including the normal profits received by the entrepreneurs and $Q$ is the total profit.

Let $Q_1$ be the amount of profit on the production and sale of consumption goods, and $Q_2$ the corresponding profit on investment goods such that $Q = Q_1 + Q_2$.

Now, $Q_1 = P.R - \frac{E}{G}R$, \[ Q_1 = I - S \]

Which on substitution can be shown as, $Q_2 = I - I'$.

Where $P, R, E, O, S$ and $I'$ have the same meaning as defined above.

Similarly, $Q_2 = I - I'$.

Where $I$ is the value (as distinguished from the cost of production) of the increment of new investment goods.

$Q = Q_1 + Q_2 = (I - S) + (I - I') = I - S$, \[ \text{(6)} \]

so that the entrepreneurs make a profit or loss according as the money-value of current investment exceeds or falls short of current savings. Capital assets appreciate in value when demand for investment exceeds supply of new investment. In an economy supply of new investment is limited by its current savings. The savings go towards building up of new capital. Hence, if demand for investment increases, while supply of new investment remains unaltered, the value of capital assets is bound to rise. Consequently, the owners of capital assets earn windfall profits which is the excess of investment over savings. Thus the windfall profits or losses are the consequences of discrepancies between
the demand for investment and the supply of funds for investment.

Using (6), Keynes' second fundamental equation (5) can be expressed as,

\[ \Pi = \frac{E + G}{0} \]

or \[ \Pi = \frac{E}{0} + \frac{I-S}{0} \] .............. (7)

(1) Here also the general price-level is made up of two terms.
   (i) \( \frac{E}{0} \) and (ii) \( \frac{I-S}{0} \)

This gives us three propositions.

(1) If investment is equal to savings, price will be equal to cost of production.

(2) If investment is greater than savings the second term of the right hand side of the equation \( \frac{I-S}{0} \) will be positive and price would be above the cost of production.

(3) If investment is less than savings, the second term of the right hand side of the equation \( \frac{I-S}{0} \) will be negative and price will be less than the per unit cost of production.

The fundamental equations of Keynes are clear indicative of a unique functional relationship between the quantity of money, the price-level of consumption goods (P) and the price-level of the output as a whole (\( \bar{P} \)) in a state of equilibrium.

Elaborating this relationship, Keynes remarks:
"This means, indeed, that in equilibrium - i.e., when the factors of production are fully employed, when the public is neither bullish nor bearish of securities and is maintaining in the form of savings-deposits neither more nor less than the "normal" proportion of its total wealth, and when the volume of saving is equal both to the cost and to the value of new investments - there is a unique relationship between the quantity of money and the price-levels of consumption-goods and of output as a whole, of such a character that if the quantity of money were double the price-levels would be double also." [Keynes, 1936, PP 146 -147]

Keynes believed that it was differences between saving and investment that were responsible for booms and depressions of trade cycle. When saving exceeded investment it was thought that a depression would occur, and when investment exceeded saving there would than be a danger of an inflationary boom. He employed the two fundamental equations mentioned above to explain the different phases of the business cycle. Although saving and investment as asserted by Keynes in his Treatise are not identical, yet this is necessary to maintain equilibrium such that \( \frac{I'}{R} - S \) and \( I - S \) must be zero, for if \( S \) exceeds \( I' \) or \( I \) then the prices would decline, losses would ensure and output will fall. The prices and output, on the contrary, would register an increase, when \( S \) falls short of \( I' \) and \( I \).

2.3. Keynes' General Theory's concept of Saving and Investment:

Keynes, in his General Theory, defines saving as the excess of income received in a period over consumption in the same period. The definition of current investment given in his
General Theory is, however, same with that in his Treatise. Income in the current period is defined by Keynes as equal to current investment plus current consumption expenditures. Denoting current income, current consumption, current saving and current investment respectively, by $Y_t$, $C_t$, $S_t$ and $I_t$. We have,

$$Y_t = I_t + C_t$$

$$S_t = Y_t - C_t$$

Therefore,

$$I_t = S_t$$

Thus, on the basis of the definitions given by Keynes in his General Theory saving and investment are understood as necessarily equal.

Keynes remarks:

"Whilst, therefore, the amount of saving is an outcome of the collective behaviour of individual consumers and the amount of investment is an outcome of the collective behaviour of individual entrepreneurs, these two amounts are necessarily equal, since each of them is equal to the excess of income over consumption. Moreover, this conclusion in no way depends on any subtleties or peculiarities in the definition of income given above. Provided it is agreed that income is equal to the value of current output, that current investment is equal to the value of that part of current output which is not consumed, and that saving is equal to the excess of income over consumption—all of which is conformable both to common sense and to the traditional usage of the great majority of economists—the equality of saving and investment necessarily follows." [Keynes, 1936, P. 63]
In his General Theory Keynes considers investment outlays and consumption outlays as the real significant variables. "Saving" is a mere residual. In the concluding sentence of chapter VI in General Theory Keynes stated that "the conception of the propensity to consume will, in what follows, take the place of the propensity or disposition to save." That Keynes relegated saving to a somewhat less important place can be understood from his statement, that the decisions to consume and the decisions to invest between them determine incomes.

Keynes' adoption of different definitions of saving in his Treatise and in his General Theory was guided essentially by the empirical considerations. In his Treatise, Keynes wanted to explain the fluctuations in prices and he attributed price variations to the inequalities between saving and investment. But in the General Theory, he wanted to explain the changes in real income and output. For this purpose he wanted to eliminate the fluctuations in prices. That basically was the reason why he assumed a necessary equality between S and I in the General Theory, while the possibilities of saving-investment inequality were emphasised in the Treatise on Money.

Keynes' saving-investment equation (S = I) is a truism. He regards saving and investment as 'merely different aspects of the same thing'. According to him both saving and investment imply unconsumed output. Though Keynes believed that saving and investment are identically equal yet he seems to state that saving and investment are equal only in equilibrium. This is true that when investment changes, income must necessarily change which is necessary to make the change in saving equal to the change of investment. Also consumers effort to consume a part of their
increased incomes will stimulate output until the new level (and distribution) of incomes provide a margin of saving sufficient to correspond to the increased investment. This process of adjustment leads to the achievement of an equilibrium. The critiques of Keynes failed to reconcile the two statements: (1) saving and investment are always equal and (2) that saving and investment are equal only in equilibrium. This confusion can be removed by viewing saving and investment relationship as a logical identity or as a matter of functional equality.

The saving and investment equation established by Keynes as detailed above is an accounting identity and it holds at all levels of income. The saving and investment accounting identity is a mere truism and has nothing to say about the behaviour of savers and investors. The accounting equality of saving and investment (called identity) is not of much use for analytical purposes, partly because it throws no light on the causal factors that determine savings, investment, consumption and income and partly because it does not involve any adjustment process, by which such an equality is brought about. As such it becomes a tool of static analysis. It is this static approach to S and I equality which has necessitated the study of actual and dynamic factors behind such an equality. The functional equality between saving and investment assumes that the savers and investors react to the variations in income in such a way that the desire to invest and save ultimately come to be reconciled. The functional equality of saving and investment is the final result of a process of adjustment between the saving and investment variables in relation to the income variable. The adjustment process in the Keynesian system can be formulated in terms of a dynamic model. In this model, saving depends upon the level of
income; investment depends upon the level of income; the rate of change of income depends upon the difference between saving and investment such that income rises when investment exceeds savings, and income falls when savings exceed investment. In equilibrium, income has a zero rate of change; it is neither rising nor falling. The equilibrium, in this sense, implies that there is no difference between savings and investment. Thus the Keynesian savings-investment equation can be looked upon as the equilibrium solution of a dynamical system. [Klein, 1947, PP. 112-113]

The dynamic adjustment model can be built with the help of the following relations which show how the ultimate position of equilibrium is reached through time:

(a) \( S = f(Y) \) (saving function)
(b) \( I = g(Y) \) (investment function)
(c) \( \frac{dY}{dt} = \gamma(I - S) \) (adjustment function)
(d) \( I(Y) - S(Y) = 0 \) (equilibrium function)

The dynamicity of the system owes to (c) which reveals that the rate of change of income \( \frac{dY}{dt} \) is a function of the difference between the intended saving and intended investment, \( I - S \). It is investment that is primarily responsible for the generation of income, and so an increase in investment brings about an increase in income and, therefore, in saving. Thus, whether saving increases relative to investment, or vice-versa, influences are set in motion that affect income, and the effect on income is to bring saving and investment into equality, as shown by equation (d). \( \frac{dY}{dt} > 0 \), when \( I > S \), \( \frac{dY}{dt} < 0 \), when \( I < S \) and is at equilibrium when \( I = S \), \( \frac{dY}{dt} = 0 \)
Klein viewed the saving-investment relationship by considering saving and investment in the schedule and observable senses. The amount of saving in the community varies with the variation in the level of income. This is the conception of saving in the schedule sense. Likewise, the volume of investment in the community varies with the variation in the level of income. This concept of investment is in the schedule sense. The term 'observable saving' refers to that particular level of saving which is calculated from the saving schedule on the basis of a knowledge of the unique equilibrium value of national income which equates saving and investment. The term 'observable investment' refers to that particular level of investment that is calculated from the investment schedule on the basis of a knowledge of the unique equilibrium value of national income which equates saving and investment. The observable values of saving and investment are discrete points, while the schedules of saving and investment form continuous series of points along the curves. In Klein's exposition savings and investment as observables are always equal, being the point of intersection of the schedules of saving and investment. All the other values of savings and investment along the schedules are not observed; they are virtual levels of savings and investment corresponding to levels of national income other than that level which actually takes place. The virtual levels of savings and investment may not be equal. Klein asserts that Keynes talked about saving and investment as observables when he (Keynes) defines

\[
\text{Income} = \text{value of output} - \text{consumption} + \text{Investment}
\]

\[
\text{Saving} = \text{Income} - \text{consumption}
\]

Therefore, Saving = Investment.
But elsewhere Keynes said, "The traditional analysis has been aware that saving depends upon income, but it has overlooked the fact that income depends on investment, in such a fashion that, when investment changes, income must necessarily change in just that degree which is necessary to make the change in saving equal to the change of investment." [Keynes, 1936, p. 633] This statement referred to a process of adjustment which achieves an equilibrium. These two diverse approaches of Keynes that (i) saving and investment are identically equal and (ii) saving and investment are equal in equilibrium have been characterized as 'apparent Keynes' and 'real Keynes' respectively by Hansen. He, however, says that these two concepts are neither contradictory nor inconsistent. What is true is that actual saving may or may not be at a point corresponding to the normal relation of saving to income. When Keynes says that, "income must necessarily change in just that degree which is necessary to make a change in saving equal to the change of investment" [Keynes, 1936, p. 184] he means that the normal relation of saving (and consumption) to income has been realised. Until this normal relation has been established one cannot say in a meaningful sense that saving is in equilibrium with investment.

Keynes failed to make it clear from the outset that the equality of saving and investment does not mean that they are necessarily in equilibrium. If the economy is in a moving equilibrium, so that the variables are always in a normal (desired) functional relationship to each other, then indeed saving and investment will not only be equal but also in equilibrium. But if the process of change involves a lagged adjustment of certain variables, this will not be the case. If, for example, there is an expenditure lag (i.e., if consumers adjust their expenditures
slowly to changes in income) then, until the lag has worked itself out, actual consumption will not be equal to desired consumption (and actual saving will not be equal to desired saving). Similarly if there is an output lag, producers being slow to adjust to increases (or decreases) in sales, then unintended investment (or disinvestment) in inventory stocks will occur. Thus actual investment will diverge from desired (intended) investment. Under either of these conditions (expenditure lag or production lag) saving and investment, though equal, will not be in equilibrium. There can obviously be no equilibrium condition until the lags have been worked through. In equilibrium conditions (lags having been overcome) saving and investment are both equal and in equilibrium, and this is true whether the system is in moving or in stable equilibrium. But if the system is not in equilibrium, saving and investment, while still equal, will not be in equilibrium.

2.4. Hawtrey’s view on Saving and Investment:

Hawtrey’s analysis of saving and investment involves a production lag. According to him, the difference between intended investment and actual investment is unintended (undesigned) inventory accumulation or de-accumulation. According to Hawtrey Y consists of C+I plus unintended (undesigned) inventory accumulation. Saving is that part of national income which is not consumed and hence the difference between saving and investment is equal to the accumulation or de-accumulation of undesigned inventory investment. Here Hawtrey has suggested a possible definition of investment from which the undesigned increments or decrements in the stock of unsold goods i.e; changes in liquid assets are being
excluded. We agree with the view of Hansen (1980) when he says that, "Keynes failed in fact to face up squarely with Hawtrey's analysis, though he agreed that unforeseen changes in sales would cause actual inventory holdings to diverge from desired inventory holdings and so affect the decisions of entrepreneurs in the next production period". [P.61] Hawtrey's formulations of saving and investment relationship forms an integral part of his theory of price movements and business fluctuations, in which changes in inventories by wholesale dealers play a strategic role.

2.5. Crowther's View on Saving and Investment: Crowther defines saving as hoarded money and investment as capital goods. He calls investment as saving in goods (capital goods) and cash holding as saving in money (hoarded money). Saving pays for accumulation of capital. Saving and investment may be unequal when more (less) money is taken out of (put back into) the stream of incomes and expenditures. The gap between them explains the occurrence of trade cycles - inflation and deflation.

2.6. Robertson's View on Saving and Investment: Robertson's analysis is known as period analysis which involves a lag. Robertson asserts that saving and investment are not necessarily equal. According to him the flow of current income springs from current consumption and current investment. To Robertson, saving is that part of income received in the immediately preceding period which is not spent on current consumption goods. Investment is defined by him in the same way as done by Keynes. Thus Robertsonian relations can be expressed as:
\[ Y = C + I \]
\[ I = Y - C \]
\[ S = Y - C \]

where \( t \) represents a certain time period and \( t - 1 \) is the preceding period.

The excess of investment over saving in the Robertsonian formulation represents the excess of income earned in the current period over income earned in the previous period. And also saving can exceed investment by the excess of previous period's income \( Y_{t-1} \) over current period's income \( Y_t \). In this context Keynes argues, "Thus when Mr. Robertson says that there is an excess of saving over investment, he means literally the same thing as I mean when I say that income is falling, and the excess of saving in his sense is exactly equal to the decline of income in my sense. If it were true that current expectations were always determined by yesterday's realised results, today's effective demand would be equal to yesterday's income. Thus Mr. Robertson's method might be regarded as an alternative attempt to mine (being, perhaps, a first approximation to it) to make the same distinction, so vital for causal analysis, that I have tried to make by the contrast between effective demand and income." [Keynes, 1936, PP. 78-79]

In Robertsonian formulation saving and investment are not necessarily equal in the same period, although forces tend to bring them into equality. Robertsonian definitions claim superiority in that they admit differences between saving and investment and not equality of the two. The absence of any difference between saving and investment has made Keynesian
definitions useless for dynamic process analysis. Of course, according to Klein (1947), "... it is not the only formulation which admits divergences between savings and investment. Such divergences are also permitted in the Keynesian definitions—but not at observable levels of income, only at virtual level. In a static Keynesian system, there can be differences between savings and investment only when the system is not in equilibrium." [Klein, 1947, P. 117]

The Swedish economists like Bertil Ohlin, Gunnar Myrdhal, and Eric Lindahl made a distinction between planned or intended (ex-ante) and realised or actual (ex-post) investment and saving. Ex-ante savings and investments are those which people intend to make, as contrasted with ex-post savings and investment, which are those actually realised. The first is prospective and represents the intension of would-be savers and the plans of would-be investors. The plans of each is based upon all the knowledge they have at hand at the time and are heavily dependent upon the state of their expectations. Should circumstances alter, these intensions would be re-examined and savers and investors will modify their actions to fit their changed appraisals of the situation. But, ex-ante, we are dealing with plans; and there is no necessary reason why planned saving and planned investment should be equal in amount. Indeed, it would be a matter of pure coincidence if they were, for the plans of savers and the plans of investors are arrived at separately. Planned savings and planned investment, barring this unforeseen and very unlikely stroke of coincidence, will not be equal. But as plans are recast in the light of actual developments within the economy each adjusts until, at any point of time, a balance sheet shows that realised savings and investment are equal in amount. Savings and
investment are equal ex post because the diverse plans with respect to ex ante savings and investment so interact upon each other as to compel readjustments of plans by savers and investors, with each forced to adjust in terms of the impact of the others. It is observed that there is distinctly opposite views by Klein and Hansen on the interpretation of the terms ex-post and ex-ante. According to Klein the terms ex-ante and ex-post finally boil down to mean schedules and observables respectively. Hansen (1949) observes that planned saving and planned investment can best be interpreted as virtual points in the schedule sense; rather, the words usually suggest absolute, and specific, planned magnitudes. If planned investment is 10 billion dollars and planned savings 8 billion, the excess of planned investment may be financed various ways, such as (1) by new money, or (2) unplanned investment such as the unexpected sale of inventory stocks. In the first case realized investment will equal planned investment, but realized savings will exceed planned savings by the amount of the new money. In the second case, realized savings will equal planned savings but realized investment will be less than planned investment by the amount of the investment of inventories.

The Swedish approach may be conceived of to be similar to Robertson's approach which involves consumption lag and Hawtrey's approach which involves output or production lag. If there is a 'consumption lag' i.e: an interval between receipt of income and actual spending or demand (Robertsonian lag), then current consumption will depend on the income of the previous period i.e: \( C_t = C(Y_{t-1}) \). Ex-ante or planned saving is equal to \( Y_{t-1} - C_{t-1} \), where \( C = C(Y) \) and ex-post saving is equal to \( Y_t - C_t \). The two are equal if \( Y_{t-1} \) and \( Y_t \) are equal. But they are not so...
as long as income is changing. If \( Y > Y_{t-1} \), ex-post savings exceed ex-ante savings. That is, there becomes unintended saving. Conversely, when \( Y < Y_{t-1} \), ex-post saving falls short of ex-ante saving, which means unintended dissaving.

Likewise, if there is an 'output lag' i.e; an interval of time between output and demand (Lundbergian lag), then what is produced in period \( t \) (based on the demand of the previous period) is different from what is actually purchased in the period. If income (and therefore demand) is rising, then purchases exceed output and stocks are run down. If income is falling (and therefore demand), then the opposite happens and stocks increase. Hence the existence of Lundbergian lag implies that there is unintended investment (or unintended dis-investment), the investment that is not planned taking the form of changes in working capital. Here output of consumption goods is \( C_t \) but the sales are \( C_{t-1} \), where \( C_t = c(Y_t) \). If \( C_t > C_{t-1} \), there is unintended dis-investment and if \( C_t < C_{t-1} \), there is unintended investment.

We have then because of lags
\[ S^* \neq S \quad \text{and} \quad I^* \neq I \]

Where \( S \) and \( I \) imply ex-ante saving and investment and \( S^* \) and \( I^* \) represent ex-post saving and investment respectively. Since ex-post saving and investment are always equal as such we have,
\[ S \neq I \quad \text{and} \quad S^* = I^* \]

The gaps are bridged by unintended saving from the consumption lag and by unintended investment from the output lag.
2.7. **Saving - Investment Gap: Economic Fluctuations and National Income**

Saving and investment play a critical role in causing economic fluctuations. Maurice, W. Lee (1976) observes that a disparity between saving and investment may be linked to the concept of a vacuum in the field of the physical sciences. Just as the scientists state that 'nature abhors a vacuum', so also it might be held that 'the economy abhors a disparity between saving and investment'. And as the forces of nature are brought into play to eliminate a vacuum, so the forces of economic adjustment are brought into play to eliminate a disparity between saving and investment. When saving exceeds investment, the economic fluctuations which are thereby produced tend toward a lowering of the national income and a general downward adjustment. When the disparity takes the form of an excess of investment over saving, then economic fluctuations tend toward an increase in national income.

Planned investment exceeds planned saving when the ex-ante investors are planning to spend more on investment than savers are planning to provide out of current income. In such situations the plans of both would be modified so that realised saving would be increased above the planned level and realised investment would be reduced from the level planned. Ex-post, given the excess of planned investment over saving, national income would rise to a new higher level.

The relation between saving and investment lies close to the heart of the matter of economic fluctuations. A disparity between these two variables apparently sets off economic
adjustments which produce changed level of national income and output.

2.8. Saving-Investment Gap and Growth Models:

The gap between saving and investment has got far reaching implications for the economic policy. The development of growth models draws greatly upon these two strategic variables. The theoretical structure of growth models is laid upon the foundations of saving–investment relationship. Presently we shall examine Harrod and Domar growth models vis-a-vis saving and investment.

The basic growth equation in Harrod’s model is

\[ G = \frac{s}{Y} \quad .... \quad (1) \]

Where \( G \) is the warranted rate of growth (\( \frac{\Delta Y}{Y} \)), \( \frac{s}{Y} \) is the (average or marginal) capital output ratio and \( s \) is the (average or marginal) propensity to save. Harrod's equation can be expressed as

\[ \frac{\Delta Y}{Y} \times \frac{s}{Y} = \frac{s}{Y} \quad .... \quad (ii) \]

\[ \frac{s}{Y} = \frac{s}{Y} \]

Since \( \frac{s}{Y} = 1 \), we have,

\[ \frac{I}{Y} = \frac{S}{Y} \]

Multiplying both sides by \( Y \), we get,

\[ I = S \quad .... \quad (iii) \]

Harrod's growth equation presumes that the system is in
equilibrium. We observe that the equality between saving and investment is quite consistent with this assumption. Had there been an inequality between saving and investment, there would have been a departure of the system from equilibrium. There would have either been expansionary or contractionary movements in the economy.

Let us now consider Domar's growth model which in a state of equilibrium, is expressed as

\[ \frac{\delta I}{I} = \lambda \frac{\delta S}{\delta Y} \ldots \ldots \quad (iv) \]

In this equation \( \frac{\delta I}{I} \) is the rate of investment, \( \lambda \) is the (average or marginal) saving - income ratio and the marginal productivity of capital. We may write Domar's equation as,

\[ \frac{\delta I}{I} = \frac{\delta S}{\delta Y} \times \frac{\delta Y}{\delta K} \ldots \ldots \quad (v) \]

or \[ \frac{\delta I}{I} = \frac{\delta S}{SK} \quad [ \, \delta K = I \, ] \]

or \[ \frac{S}{I} = \frac{\delta S}{I} \quad [ \, \delta K = I \, ] \]

Which implies \( I = S \)

This also shows that a self-sustaining equilibrium model is based upon the equality between saving and investment. Any divergence between the two will initiate, through the multiplier process, the expansionary or contractionary movements in the economy.
Again for a simple example of the "saving - investment gap" analysis, we may recall that the basic Harrod - Domar growth model postulates a direct relationship between a country's rate of savings, s, and its rate of output growth, g, via the equation \( g = \frac{s}{k} \) where \( k \) is the national capital-output ratio. If the desired rate of national output growth, \( g \), is targeted at 7% annually and the capital-output ratio is 3, then the needed rate of annual saving is 21% (since \( s = g \times k \)). If the saving that can be domestically mobilised amounts to only, say, 16% of GNP, then a "saving gap" equals to 5% can be said to exist. If the nation can fill this gap with foreign assistance, it will better be able to achieve its target rate of growth.

The major growth models are fundamentally dependent upon the equality or inequality between saving and investment.

REFERENCES


