PART I

PRICES AND DEVELOPMENT
CHAPTER II

APPROACH TO THE EXPLANATION OF INSTABILITY

A. Stability and Balance

We make a distinction here between a 'growing economy' and a 'developing economy'. The former is an advanced country where deliberate efforts to raise income levels are at best of a marginal nature. A 'developing economy' is an underdeveloped country which is attempting to raise its income levels in the long run through deliberate or planned efforts at bringing about a structural change in the whole economy. The problem of instability faced by the former is a cyclical one, brought about mainly by natural or free-market forces; in the latter, this problem arises through the volume and nature of development efforts undertaken and the pressures generated thereby.

The problem of stability in a growing economy has been tackled by Harrod and Domar by asking at what rate income and investment should grow to ensure full employment. Though

there are certain differences between their approaches and analyses, both deal primarily with an advanced economy and their analyses is the result of considering the problem of the capacity-creating effect of investment which itself is undertaken to achieve full employment on Keynesian prescription. Though Higgins says that the theory as a tool of analysis can be applied to underdeveloped countries as well inspite of the fact that both Harrod and Domar had an advanced economy in their mind, there are certain difficulties in the way of using these models, as they are, in explaining the instability peculiar to developing countries. The first difficulty is that theirs is a one-sector model and thus becomes too simple a tool for a very complicated problem of the developing countries. Secondly, with Harrod, savings and investment are always equal and the system does not allow for any difference between the two; it allows only

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for differences between intended and realized investment.

Thirdly, investment here is 'induced' and this is not the type of investment which is to be found as the main element in developing countries. In such countries, investment is planned and undertaken by government itself or is stimulated by government encouragement. It is not necessarily 'induced' by the previous rate of growth of national output. A model which can explicitly take into account the several factors of key importance in developing countries will be more convenient for our analysis.

We may now set out our hypothesis as follows: the problem of economic development with stability is mainly a problem of maintaining or achieving some sets of ex ante balances in a developing economy. They are:

1. Balance between demand for and supply of consumer goods in a given period t;
2. Balances between different consumer goods industries;
3. Balance between demand for and supply of capital goods industries in period t;
4. Balance between different capital goods industries;
5. Overall balance in the economy.

5. For a discussion of the limitations to the applicability of these models to underdeveloped countries, see K.K. Kurihara "The Keynesian Theory of Economic Development", London, 1969, pp. 62-73.
The problem of balance is the problem of securing consistency among physical targets and also between physical targets and financial outlays made.

The second and fourth of the conditions set out above are subsidiary to the first and third conditions respectively. This Chapter is devoted to examining whether balances dictated by these different conditions yield mutually consistent results, that is, if they also secure overall balance. This will enable us to see later what instabilities are generated if any of these conditions of balance is violated. The special position and role of agriculture can then be indicated and appreciated.

A consumer good (or service) is any good which satisfies a 'want'. A want is felt for its own sake and its satisfaction is an end in itself. We shall assume that the purchase of a consumer good, perishable or durable, is itself consumption. Whatever consumer goods are produced in a given period are assumed to be consumed in the same period.

That part of output, not consumed in a given period and meant for further production, constitutes the investment of that period. A part of this consists of durable means of production such as tools, machinery and construction
A part also may consist of inventories, i.e., raw materials which have accumulated. We may call these two parts of investment as pure investment. We shall assume, however, that substantial amount of raw material required for production during a given period are to be produced in that period only, requiring outlays to be made for producing them in the same period.

Outlays have also to be made for training and education of people, which equip them for productive activities. Outlays on these as also on research and organisation in various fields, building roads and other social overheads etc. may be grouped together and called productivity-improving investments. However, we do not regard expenditures on items like food and medicine as productivity-improving investments.

6. Economists usually include housing under investment. The only reason for distinguishing this from other durable consumer goods seems to be that it yields monetary or imputed rent. But other durable consumer goods can also have such rents. There is no necessity for making an exception of housing for the criterion of a capital good, viz., whether it is utilised for further production or not. Kuznets says, "For a society bent on forcing the pace of industrialization, residential construction hardly seems to be bonafide capital..." But he seems to include housing under capital formation only because it is traditional practice. G.S. Kuznets, "International Differences in Capital Formation and Financing", in National Bureau of Economic Research, "Capital Formation and Economic Growth", Princeton, 1955, pp. 20-21.
investments of this type, because they are incurred to satisfy a 'want' and are consumption expenditures.

B. A Model

Now we can explain the conditions of balance set out above in terms of a simple model, the main features of which are:

1. A 'period' in this analysis refers to a period during which outlays - for production or consumption - are made on the assumption, that prices ruling in the previous period will continue in the present period also. The 'period' refers to a production period during which outlays are made and production obtained. The monetary value of the propensity to consume is assumed to remain unchanged during the period. In the course of this chapter, no change in absolute or relative prices is brought in; this is done in the next chapter.

2. We ignore military expenditures or investment therein; but the model can very well explain their significance for prices, when applied.

3. In period \( t-1 \), capital goods (physical assets) are available at the end of the period \( t-1 \), for utilization in period \( t \). This is the result of investment in period \( t-1 \). When operated upon, this \( I_{t-1} \) generates output in period \( t \) as determined by the capital-output ratio. This output consists of both consumer goods (and services) and capital assets, depending on the allocation of investment.

4. The capital-output ratio here relates the total output that is produced with the value of total capital equipment or total physical assets available for utilization in the given period \( t \). It is calculated on the assumption of full utilization of capital goods and this ratio is assumed to be given for the period. This ratio is determined by the organizational set up, the efficiency of the labour and the technique of production used. As such capital-output ratio obtaining in period \( t \) is influenced by 'productivity-improving investment' of period \( t-1 \). Similarly the productivity-improving investment of period \( t \) influences the capital-output ratio of period \( t+1 \), and not of period \( t \) itself.

5. For simplicity, we assume that capital equipment existing at the beginning of period \( t \) gets depleted or depreciated by the end of period \( t \) itself. Unless this equipment is replaced or reproduced in period \( t \), the real
The income of the community in period \( t+1 \) will decline to the extent to which the capital goods are not replaced.

As capital equipment is assumed to depreciate within period \( t \), the capital-output ratio used here is the ratio of capital to output obtained during the entire lifetime of that asset, i.e., till it is depreciated. So, it should necessarily be less than one. Otherwise, it would not be worthwhile creating and operating that capital. If, however, the duration of some capital equipment is assumed larger than the period \( t \), the ratio relevant for the period in that field can be more than one.

Following the utilization of \( I_{t-1} \) (capital equipment available at the beginning of period \( t \)), the total output (gross) of period \( t \) would be

\[
Y_{gt} = \frac{I_{t-1}}{\sigma} \quad (1)
\]

where \( \sigma \) is capital-output ratio (units of capital goods needed measured in rupees to produce one unit of output), and \( Y_{gt} \) is national gross output in period \( t \).

This \( Y_{gt} \) consists of consumer goods and services, capital equipment and also productivity-improving type of investment. Raw materials are also a part of it. So that,

\[
Y_{gt} = R^+(0-R) + (I_t - R) + I_p \quad (2)
\]

where \( R \) is raw material output, \( C \) is consumer good output,
It is capital equipment output of period t available for utilization in period t+1 and \( I_p \) is productivity-improving investment made. \( I_t \) and \( I_p \) together form investment of period t. \((C-R)\) and \((I_t-R)\) are value added in consumer and capital goods industries respectively. The equation (2) is nothing but,

\[
Y_{gt} = C + I_t + I_p
\]

In this, the raw material content is not explicitly stated.

C. The Problem of Allocation

Now the problem is how to allocate the capital equipment available for utilization in the period t, \((I_{t-1})\), as between different components like R, \((C-R)\), \((I_t-R)\) and \( I_p \), as also between different sectors like agriculture, industry etc. Let us assume that \( I_{t-1} \) is so homogeneous that proper allocations can be made without wasting any equipment because of its being specific to some production. This assumption amounts to the same thing as assuming that producers in period t-1 had perfect foresight of demand conditions in period t, so that they produced the different capital goods in period t-1 exactly in such quantities as would be needed for producing the different products (and services) in period t. Needs of balance require that in each sector only that much of capital is to be allocated as would produce quantity demanded of that product.
When we come to the question of demand, especially consumer demand, the concept of National Product becomes relevant. The value of GNP is equal to the value of capital equipment used ($I_{t-1}$ here) plus wages paid, rent and interest paid and profits made. However, capital equipment which is used and depreciates in period $t$ was produced in the previous period and was also paid for in that period and constituted a part of the income of period $t-1$. Hence the national income of period $t$, ($Y_n$), would consist of the value of GNP minus the value of capital equipment which has depreciated; in other words, national income is equal to the value of net national product. It is this which is the disposable income of period $t$, and which generates consumer demand and savings.

We can then say that total consumer demand (or the total financial outlay made on consumer goods and services) is equal to $Y_n\cdot\alpha$, where $\alpha$ is average propensity to save.

8. Of course, we can also speak of Gross National Income. Here, the value of capital equipment would be included in profits, and profits will be gross. Thus the sum of factor payments which includes profits (gross) would be again equal to national income (gross). But gross profits cannot be considered as disposable income; only profits net of capital equipment depreciated or used up can be so considered. See Oscar Lange, "Essays on Economic Planning", Indian Statistical Series No. 4, Statistical Publishing Society, Calcutta, 1960, pp. 6-7, where he also considers net national product as disposable income.
consume. We assume the value of $\alpha$ as given for the period $t$, which is exogenously determined by (i) distribution of income, (ii) population growth, (iii) tax-structure and (iv) demonstration effect.

To produce $Y_n$ of consumer goods, the required capital equipment would be

$$I'_{t-1} = Y_n \times \alpha$$

(3)

where $I'_{t-1}$ is the capital equipment required to produce consumer goods demanded. This means that proportion of capital equipment allocated to consumer goods production ($I'_{t-1} / I_{t-1}$) would be

$$\frac{I'_{t-1} \times Y_n \times \alpha}{I_{t-1} \times Y_c} = \frac{Y_n}{Y_c}$$

(4)

9. Of these four factors, we have to say something about population growth. The effect of this on $\alpha$ is that it increases it. Population growth decreases per capita income and if the population is accustomed to existing consumption standards and cannot reduce it, i.e. if income elasticity of demand for consumption is zero downward (with income falling) then $\alpha$ will be raised to the same extent as population increases, assuming no change in national income ($\Delta \alpha / \alpha = \Delta P / P$, where $P$ is population, measured in adult consumption units.) Zero elasticity of demand at least for necessities (mainly food) when income is falling, is not an unrealistic assumption; if not zero, it will be near-zero. People strive to maintain their essential consumption by sacrificing either savings or purchase of luxuries and then comforts.
This equation, assumes uniform value for $o$ in all sectors. If, however, the value of $o$ in consumer goods industries is less than in other sectors, then the value of $I_{t-1} / I_t$ will also be less than what is indicated in equation (4). In this case, the equation would be

$$\frac{I_{t-1}}{I_t} = \frac{Y_{n-1} \cdot o'}{Y_{n} \cdot o} \quad (4a)$$

Where $o'$ is the capital-output ratio in consumer goods industries, and $o$ is the average (weighted according to the size of different sectors) ratio for the economy.

If allocation is done according to equation (4), it would satisfy the first condition for balance mentioned above. This condition can be restated as follows:

$$\left( C + I_N^* + I_p \right) \cdot \alpha \leq 0 \quad (5)$$

Or

$$0 \cdot (1 - \alpha) = (I_N^* + I_p) \cdot \alpha \quad (5a)$$

The equation (5) says that financial outlays made on consumer goods and services should be equal in ex ante terms.

10. In these two equations, $C$, $I_N^*$ and $I_p$ are measured net of depreciation, so that $Y_n = C + I_N^* + I_p$.

11. This equation (5a) is the same as equation (1) in Raj-Sen model. See K.N. Raj and A.K. Sen, "Alternative Patterns of Growth under Conditions of Stagnant Export Earnings", O.E.P., 1961, p.46.
to the value of production of these goods and services. The equation (5a) says that marketable surplus of the consumer goods sector should be equal to the demand for consumer goods generated from production in other sectors.

The same approach also gives an answer to the problem of allocation of \( I_{t-1} \) among different consumer goods and services. The allocation is to be in the same proportion as the average propensity to consume those different goods and services. That is,

\[
I_{t-1}^1: I_{t-1}^2: \ldots: I_{t-1}^n = \alpha_1: \alpha_2: \ldots: \alpha_n \quad (6)
\]

where subscripts 1, 2, \ldots n refer to different consumer goods and,\[
I_{t-1}^1 + I_{t-1}^2 + \ldots + I_{t-1}^n = I_{t-1}
\]

and \( \alpha_1 + \alpha_2 + \ldots + \alpha_n = \alpha \)

Allocation according to this, satisfies the second condition of balance listed above.

When the allocation for consumer goods sector is thus determined, the residue of \( I_{t-1} \) would be allocated to capital formation. The proportion of capital equipment allocated to produce investment goods, in this case would be,
\[
\frac{I_{t-1}}{I_t} = 1 - \frac{Y_t}{Y_{t-1}} \quad \text{or} \quad 1 - \frac{Y_t}{Y_{t-1}} = \frac{I_{t-1}}{Y_{t-1}} \quad \text{(7)}
\]

But this approach may or may not secure balance between consumption in period \( t \) and consumption in period \( t+1 \), in the sense that it may or may not provide for the replacement of \( I_{t-1} \) by the end of period \( t \), which alone can ensure the maintenance of consumption levels over time, unless we have reason to believe that there would be a corresponding fall in the capital-output ratio. It is better to arrive at the proportion to be allocated in producing replacement capital (i.e. the amount of capital goods which replace capital goods utilised, and ensure the maintenance of consumption levels over time) independently rather than through the equation (4). This proportion can be designated as \( \frac{I_{t-1}}{I_t} \).

The amount of capital needed to produce this replacement capital to \( I_{t-1} \) would be \( \frac{I_{t-1} \cdot 0}{I_t} \), where \( 0 \) is the capital-output ratio in capital goods industries. Therefore,

\[
\frac{I_{t-1} \cdot 0}{I_t} = 0 \quad \text{or} \quad \frac{I_{t-1}}{I_t} = \frac{I_{t-1}}{I_t} \quad \text{(8)}
\]

In other words, the proportion of capital equipment needed to reproduce replacement capital is equal to capital-output ratio in that industry.
However, this equation ensures only that real income enjoyed in period $t$ can be maintained in period $t+1$. But this is not the characteristic of a developing economy; for that, real income level in $t+1$ should be greater than that in period $t$. This means that production of capital goods should be over and above that required for replacement of

$$I_{t-1} + I_{t-1}$$

This is no problem if $\frac{I_{t-1} + I_{t-1}}{I_{t-1}} < 1$. In this case, the residue i.e. $1 - \frac{I_{t-1} + I_{t-1}}{I_{t-1}}$ can be easily utilized to allow for a net increase in the production of capital goods, which we may call as development capital, since it provides an increase in national output over time.

A community, however, may be too impatient to be content with a rate of development warranted by this residue. It may set a rate of development as its goal, determined independently of actual resource considerations, or rather, independently of resource-requirements for satisfying present consumption. This rate may be dictated by the need for catching up with the developed countries in as short a time as possible, or inspired by a sense of optimism on the part of planners about the possibility of cutting down present consumption to permit a release of resources for capital formation.
To achieve this targeted increase in real income, one would require a net increase in capital goods of the order of

$$\Delta I_{t-1} = \Delta Y_a \cdot c$$

where $\Delta Y_a$ is targeted increase in income, and $\Delta I_{t-1}$ is needed increase capital goods over $I_{t-1}$ determined by $\Delta Y_a$.

To produce this $\Delta I_{t-1}$, we would need a proportion of capital goods according to,

$$\frac{I_{d_{t-1}}}{I_{t-1}} = \frac{\Delta I_{t-1} \cdot c}{I_{t-1}}$$

where $I_{d_{t-1}}$ is capital goods allocated to the production of development capital.

Often it is difficult to distinguish capital goods as those meant for replacement and those meant for development or growth. A capital good that has depreciated may be replaced by an improved type of good and it cannot be called replacement or substitution exactly. What is important is that capital goods are created which not only maintain but also increase the national income. A part of capital equipment has also to be allocated to productivity-improving type of investment. We can conveniently group together $I''_{t-1}$.

and also the capital equipment needed for \( I_p \), as \( I_{t-1} \), which would then be the allocation for capital formation.

If the capital goods needed for different industries are specific to those industries, then the question of balance between different capital goods industries arises. The demand for capital goods in period \( t \) is derived from the product-pattern in period \( t+1 \). So,

\[
I_{t-1} \cdots I_{t-1_n} I_{t-1_k} \cdots e_{t-1_1} \cdots e_{t+1_n} \left(1-e_{t+1}\right) \equiv \ldots \tag{11}
\]

where, \( I_{t-1_1} + \cdots + I_{t-1_n} + I_{t-1_k} \equiv I_{t-1} \) and \( I_{t-1_1} \cdots I_{t-1_n} \) is allocation for production of capital goods in period \( t \) required to produce consumer goods 1,...,n in period \( t+1 \);

\( I_{t-1_k} \) is allocation for production of capital goods in period \( t \) required for capital formation in period \( t+1 \);

\( e_{t-1_1} \cdots e_{t-1_n} \) are proportion of output of consumer goods 1,...,n to gross national output in period \( t+1 \); \( 1-e_{t-1} \) is proportion of capital formation to national output (gross), and \( e_{t+1_1} + \cdots + e_{t+1_n} + (1-e_{t+1}) = 1 \).

Equations (8) and (10) satisfy balance-condition (3), and equation (11) satisfies the balance-condition (4) listed above. These equations tell us how to allocate capital equipment available so as to satisfy the demand for capital goods, just as equation (4a) tells us how to allocate capital
to consumer goods and services so as to satisfy demand for them.

The important problem is whether these equations yield a mutually consistent solution. There would be no problem at all if,

\[
\frac{\dot{I}_t + \ddot{I}_t}{I_{t-1}} = 1
\]

where \( \dot{I}_t \) is derived from equation (4a) and \( \ddot{I}_t \) is derived from equations (8) and (10), including it the requirement for productivity-improving investment.

If this equation (12) is satisfied the condition for overall balance would be satisfied. This is because it ensures allocation of capital in such a way that it satisfies demand for all consumption goods and services (individually for different consumer goods and also aggregate) besides satisfying the need for capital to achieve the desired rate of capital formation. This also means that savings \textit{ex ante} equal investment \textit{ex ante}, while intersectoral balance is achieved. The extent to which the value of

13. We shall shortly see, however, that equality of \textit{ex ante} savings and investment need not necessarily mean overall balance as defined.
left hand side of equation differs from unity may be called the extent of inherent imbalance in a plan for economic development, and instability is the result.

D. Imbalance and Inflation

Thus when the value is less than unity, it means that resources demanded are less than what are available, leading to idle capital equipment and other resources. In other words, the situation is deflationary. But the developing economies do not have to face such a problem. Their problem is that the value of the left hand side of the equation exceeds unity. The dilemma of development is that with a high propensity to consume, the proportion of resources to be allocated for production of consumer goods demanded would be very high. But if such allocation is made for consumption, the residue would not suffice to achieve a high rate of growth in future; if this is not made, i.e., if greater allocation is made for capital formation at the cost of consumption, the value of the left hand side of the equation exceeds unity, which means that balance-conditions (1) and (2) will be violated. The result is inflationary.

It is already familiar to us that this type of situation has been analysed in aggregative terms through
Keynesian tools. The culprit is the disparity between ex ante savings and ex ante investment. All consumption outlay is aggregated, and the excess of investment outlay over aggregate saving is termed an inflationary gap (which is also a measure of aggregate excess demand i.e. the difference between the total financial outlay or expenditure and aggregate supply or real income in terms of initial prices), and this is what causes the prices to rise.

But the disturbance of overall balance above is much more significant than the existence of an aggregative inflationary gap or disparity between ex ante saving and investment. Unlike the latter, the former stresses balance in each sector or industry. It is possible that when there is no disparity between these aggregate entities, the overall balance may not be there. Thus if there are two types of consumer goods which people go in for, one of which is produced in quantities more than

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14. If C is consumption outlay, I is investment outlay, and \( Y_r \) is total real income in terms of initial prices, then the inflationary gap is \((C+I) - Y_r\), which is the same thing as \((I-S)\), where S is total saving including taxes. See K.K. Kurihara (who allows for exports and imports also), "National Income and Economic Growth", London, 1951, p.42.
what is demanded, and the other in quantities less than demanded, we cannot speak of aggregate balance, even if the difference between demand and production in each are arithmetically such as to cancel each other. In such an event, ex ante saving could equal ex ante investment and yet instability would be generated. Whether the situation is inflationary or deflationary will be determined by the nature of consumer goods — the propensity to consume them and the repercussions the price-rise of each good will unleash. If an inflation develops here, it "does not stem simply from the failure of the government sufficiently to restrict total consumption (that is, from the failure to provide the necessary saving). Rather it is the result of unbalanced development, which is forcing total consumption into a less desired pattern". It is thus important to note demand-supply situation in each sector and not just aggregatively. But it is just this that the aggregate Keynesian analysis fails to do.

But even supposing that people go in for one kind of consumer good, in which case equality between ex ante saving and investment would also mean overall balance, the inflationary gap analysis does not take into account the

differences in the competitive nature of individual markets. It assumes that given a gap, prices automatically rise. If aggregate excess demand as the difference between actual total outlay and real income in initial prices is said to determine price level, it is nothing but a truism. The criticism which has long been levelled against the quantity theory of money can as well be applied to this, that it is only a truism. In fact, the quantity theory and this approach amount to the same thing - an excess of investment over savings cannot materialise unless financed by creation of additional money.

The theory of inflation should answer the following questions to explain the mechanics of rising prices, viz., how do the forces of demand and supply act in different sectors; how do the prices behave in different sectors, at the same rate or different rates; what determines the differences in rates; what is the interrelationship between prices in different sectors; what is the significance of each sectoral price-level for the general

16. Haslitt remarks, "what makes prices rise according to Keynes, is a rise in Aggregate Effective Demand, and aggregate or effective demand turns out to be, for all practical purposes, synonymous with the money-supply". Henry Haslitt, "The Failure of the 'New Economics'", D.Van Nostrand Co., Princeton, 1959, p.298.
price-level; are these price rises beneficial or detrimental to economic development; and are these price-rises self-correcting or self-aggravating. To answer these questions, a sectoral and a micro-approach also has to be adopted; a purely aggregative approach would not help. "Unless one has a correct theory of individual prices and of relative prices one is unlikely to have a correct theory of the price 'level' which is merely an average made up of individual prices". In fact, Hayek said this long back but his stand was swept away, as it were, by the tremendous impact of Keynesianism. But the Keynesian approach did not go unchallenged. Some economists, in fact, questioned the capacity of prices to respond to excess demand at all. Models of Holzman, Dow and Dicks-Mireaux may be cited in this connection. However, more reasonable approach seem to be that we should take into

17. Ibid. p.296.
account the market situation prevailing in different sectors and see what are the sources of price-rise in each sector and then note how they affect prices in other sectors. It is only after such an analysis that we can speak of a general price-level. It is here that models of authors like Duesenberry are more helpful, who recognise the fact that sources, nature and speed of price-rise are different in different sectors.

We may, therefore, say that the composition of overall imbalance (if it emerges) is more important than the mere size of total imbalance. We shall see in the next chapter how the price-rises are generated in different sectors, once such an overall imbalance emerges.

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