On the Determination of the Level of Employment in a Growing Capitalist Economy¹

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1. Introduction

In most models of economic growth, neo-classical and neo-Keynesian, it is assumed that labour is fully employed. In neo-classical models full employment is the outcome of competitive factor pricing: If the number of workers employed falls short of the full employment labour force, then the real wage rate declines and falls below the marginal product of labour. In view of such a situation, entrepreneurs find it advantageous to employ more workers. Full employment is reached as soon as the real wage rate equals the full employment marginal product of labour. [This process is described, for example, in the basic neo-classical growth model put forward by R. M. Solow (Solow [1956], p. 164).]

In neo-Keynesian models of economic growth the full employment assumption is seen as a reasonable way of closing the model². (See for example Kaldor [1955/56].) The justification for this assumption seems to be that the realised rate of profit as determined by the investment-output ratio and the savings coefficients is always equal to or higher than the minimum rate of profit. Full employment can then be brought about by appropriate fiscal and monetary measures. There may even be an inherent tendency towards full employment: If, for some reason or another, the level of investment is high, then, according to the neo-Keynesian mechanism of distribution, the rate of profit will be high, too. This, in turn, will induce entrepreneurs to invest more. A cumulative process of growth is thereby created. This process will come to an end as soon as full employment is reached. The economy will then grow at the natural rate of growth.

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² An exception is, of course, the model of economic growth put forward by Joan Robinson [1956]. She describes various ways in which accumulation of capital may take place in capitalist economies. We think, however, that Joan Robinson cannot, within the framework of her model, say whether the growth paths along which these economies are moving are stable or not. [Harrod's proposition that growth equilibria are unstable (Harrod [1939]) has, in fact, never been disproved except by the neo-classicals whose "proof", however, is wrong as will become evident later on.] But, if the process of growth is unstable, then all one can say about the level of employment is that, either, there will be a tendency towards full employment or a tendency towards chronic unemployment.
Whether the belief, held by many economists, that capitalist economies are tending towards full employment or that full employment can be achieved through state intervention, is justified or not is an empirical question. If one looks at the levels of employment that have prevailed in all capitalist countries, developed or underdeveloped, since the Second World War, then there is no reason to believe that governments can guarantee steadily rising employment in underdeveloped countries or full employment in developed countries.

The purpose of this article is to show that there exists, in capitalist economies, a stable long-run equilibrium level of employment which need not correspond to full employment and to say something about the most important determinants of this employment level. The analysis will be based on a simple neo-Keynesian growth model supplemented by a technical relationship between output and labour. The approach we choose to explain the distribution of income is that described by Ricardo and Sraffa (Ricardo [1821] and Sraffa [1960]) rather than that put forward by the Marginalists.

Before starting with our analysis let us give a brief outline of what we intend to do in the following sections.

In sections two and three we shall describe how short-run equilibria in capitalist economies are achieved. In a further section we shall be concerned with the determination of the rates of profit and of technical progress. Both concepts are prerequisite to an analysis of the long-run behaviour of a capitalist economy which we shall deal with in sections five and six. In section seven we shall discuss some implications of the model and in a final section we shall make some concluding remarks.

2. Variables and Equations of the Short-Run Model

In this section we define the variables entering our short-run model of a capitalist economy and specify the relations between them.

Let us start by writing down a technical relationship between output \( O \) and employment \( L \):

\[ O = \alpha \cdot L. \quad (1) \]

\( O \) is gross domestic output measured in terms of a bundle of consumption goods produced in fixed proportions. \( L \) is measured in man-years and \( \alpha \) is labour productivity\(^3\). The latter is a function of capital per worker, \( k \): Given the normal rate of profit, a higher productivity of labour is associated with a higher capital-labour ratio \( (\alpha = f(k), f' > 0, f'' < 0) \). The stock of capital, \( K \), is made up of many capital goods. All of them are valued in terms of the before-mentioned bundle of consumption goods. Again, the rate of profit is supposed to be given.

\(^3\) A complete list of the symbols used is given at the end of the article.
It is obvious that no theory of distribution is contained in the technical relationship between $a$ and $k$ because output and capital are valued at prices determined by the desired (or normal) rate of profit, the ruling money wage rate and the coefficients of production, i.e. at the prices of production in the sense of Sraffa [1960].

Labour productivity $a$ and capital intensity $k$ are assumed to be fixed in the short run. From this follows that the demand for labour cannot be derived from a marginal condition saying that the real wage rate equals the marginal productivity of labour, as this is the case in neo-classical and Keynesian (not neo-Keynesian!) models of employment. All we can say at this stage is that, in the short run, the upper limit to the demand for labour is determined by the existing stock of capital. We denote this upper limit to the demand for labour by $L$, where $L$ is that level of employment at which the existing stock of capital is fully utilised. (By full utilisation of the existing stock of capital we mean in fact normal utilisation). We therefore have

\[ L \leq L \leq L_f, \]  

(2)

where $L_f$ represents full employment labour force.

The level of the money wage rate $w$ is the outcome of bargaining between entrepreneurs and trade unions:

\[ w = \bar{w}. \]  

(3)

Rent on land in money terms is fixed by landowners in a way as to get a normal rate of return on investment in land:

\[ R = \bar{R}. \]  

(4)

Total expenditure on gross domestic product at current prices, $Y$, is the sum of three items. The first of these, gross private and public investment, is exogenously given in the short run and is independent of the general price level. The two other items are consumption out of wage income and consumption out of property income, i.e. dividends and rent on land. The fraction of wages consumed is $c_w$, that of property income $c_\pi$, where $c_w > c_\pi$. (Note that we do not define $c_w$ and $c_\pi$ as the propensities to consume of workers and capitalists. The reason why we define $c_w$ and $c_\pi$ as fractions of wage and property income consumed is that there are people who receive wage as well as property income. By choosing the latter definition we avoid the "Pasinetti difficulty" of having to distinguish between profit and/or rent income accruing to workers and property owners respectively. But, in doing so, we cannot say anything about the long-run implications of this savings behaviour upon the ownership of property. This, however, is not a problem we want to deal with here.) Total expenditure in money terms can then be written as

\[ Y = P \cdot I + c_w \cdot w \cdot L + c_\pi \cdot (II + R), \]  

(5)

4 Throughout this note we use the expression "capitalist" in the same sense as "property owner".

5 See on this point Pasinetti [1962] and Kaldor [1966].
where \( P \) is the general price level, \( I \) is gross investment in real terms, that is to say in terms of a bundle of consumption goods, \( \Pi \) are gross profits in money terms and \( R \) is rent on land also in money terms.

If goods markets are to be cleared in the short run, then the following equilibrium condition has to be fulfilled:

\[
O = Y/P. \tag{6}
\]

An additional relationship is given by the fact that the sum of wage and property income always equals gross domestic income:

\[
Y = wL + \Pi + R. \tag{7}
\]

These are all the variables and equations we need in order to be able to determine the short-run equilibrium position of an economy. The way in which this type of equilibrium is brought about will be described in the next section.

3. Short-Run Equilibrium

In the previous section we have set forth a system of six equations, (1) and (3) to (7), and seven variables, \( O, L, P, w, Y, \Pi \) and \( R \). Let us now assume that capacities are fully utilised. Then, as can be seen from constraint (2), \( L \) equals \( \bar{L} \). (This, of course, still leaves open the way in which \( \bar{L} \) is determined. The determination of \( \bar{L} \) will be discussed in sections five and six).

We are now in a position to reduce the system of equations set out in section two to one equation in one variable, namely:

\[
P \cdot \alpha \cdot L = P \cdot I + c_w \bar{w} \bar{L} + c_n (P \alpha \bar{L} - \bar{w} \bar{L}). \tag{8}
\]

Solving this equation for the unknown \( P \), the price level, yields:

\[
P = \frac{(s_n - s_w) \bar{w} \bar{L}}{s_n \alpha \bar{L} - I} \tag{9}
\]

because \( c_w - c_n \) equals \( s_n - s_w \).

Relation (9) tells us that goods markets will ultimately be cleared by price adjustments\(^6\). This, in turn, implies that profit margins and real wages are flexible within certain limits. We have to emphasize "ultimately cleared" because goods markets can be temporarily cleared by changes in the level of stocks without price changes occurring.

From equation (9) can be seen that, given all the other variables, the general price level is a linear function of the money wage rate. This means that the "supply of money" has no influence upon the determination of the price level. At any given rate of interest, the quantity of money adjusts to what is needed for transaction purposes.

\(^6\) To speak in Hicksian terms we are using a flexprice model here. We do this for analytical convenience. A fixprice model combined with varying degrees of capacity utilisation would yield exactly the same conclusions. (See on both types of pricing models Hicks [1965].)
Furthermore, it follows from equation (9) that, in the short run, real wages depend upon investment in real terms only. In fact, \( \bar{w} \) increases as \( I \) decreases and vice versa. The economic meaning of this relationship between real wages and investment is twofold.

Firstly, it means that, given a certain level of productive capacity, there exists a trade-off between the real wage rate and the rate of growth. A lower real wage rate is associated with a higher rate of growth and vice versa. It has to be noted, however, that this is true in the short run only. The term "short run" is used here in the usual sense of the word, namely as a period of time in which the stock of capital cannot be changed. The relationship between the level of investment and the real wage rate is, as will become evident in section six, completely different in the long run.

A further aspect of the real wage-rate of growth trade-off is that, given \( \bar{w}, \bar{L}, \alpha, s_{w}, s_{\pi}, \) and \( I, \) prices have to be such as to bring about the distribution of income which ensures that effective demand is sufficient to buy gross national product \( \alpha\bar{L}. \) The important fact here is that \( s_{\pi} \) is considerably larger than \( s_{w}. \) Then, if effective demand falls short of total supply, income in real terms will have to be redistributed in a way as to increase the share of the income group which spends more on consumption, namely wage earners. This can be brought about by a relative fall in prices with respect to money wages.

The way in which the short-run equilibrium is established can be most easily seen from diagram 1.

In this figure the level of full capacity employment is given by \( O\bar{L}, \) that of full capacity gross output by \( O\bar{B}. \) In order that effective demand be sufficient, the general price level has to be such as to ensure that the wage bill in real terms be given by \( O\bar{A} \) and that property income, again in real terms, be given by \( AB. \) If, given the money wage rate \( \bar{w}, \) the general price level is higher than the equilibrium level, then wage earners get less than \( O\bar{A} \) in real terms, \( O\bar{A}' \) say. Property income equals \( A'B'. \) Effective demand \( OB' \) falls short of total supply \( OB. \) Falling prices or rising money wages will then bring about the equilibrium situation described above.

It is evident that the approach chosen to explain the short-run distribution of income is neo-Keynesian: Given the fractions of wage and property income saved, investment determines the amount of profit, and, because of the fact that the stock of capital is given, the real wage rate appears as a residual.

4. Determination of the Rate of Profit and of the Rate of Technical Progress

Before being able to discuss long-run aspects of a capitalist economy we have to explain the determination of two important parameters which enter our long-run model, namely the rate of profit and the rate of technical progress.
There are, as we have already mentioned, two main views on how the rate of profit in a capitalist economy is determined in the long run.

According to classical economic theory profits are, after rent has been deducted, a surplus over wages (see Ricardo [1821]). In this model of distribution the wage rate is exogenously given and the rate of profit is determined by the model.

Nowadays, one tends to assume that the rate of profit is exogenously determined and that wages appear as a residual (see for instance Kalecki [1943]). The factors determining the rate of profit are economic, social and political. The common feature of both theories of the rate of profit is that either the wage rate or the rate of profit has to be determined outside the economic system.
Another theory of the determination of the rate of profit is that provided by neo-classical economists. According to this theory all the factors of production get as a reward their marginal product. Therefore, in equilibrium, the rate of profit, the rate of interest and the marginal product of capital are all equal to each other.

There are several reasons why we think that distribution is regulated by economic, social and political factors and not by the principle of marginality. We content ourselves with stating these reasons dogmatically.

Firstly, we have the fact that there is a wage bargain between entrepreneurs and trade unions. The outcome of this bargain is affected by many factors: the percentage amount of unemployment, the future prospects of a particular industry, the amount of social security benefits paid to unemployed workers and to families of workers on strike, the relative wealth of capitalists and workers and so on. Secondly, prices are not parameters to individual firms but are determined by them. The way in which prices are formed is that a certain mark-up covering fixed costs and providing for an acceptable rate of profit is added to variable costs. The size of the mark-up in a particular industry is mainly determined by the structure of the market and by the intensity of competition.

Thirdly, and this immediately follows from the previous point, output is not determined by the equality of marginal costs and price. The contrary is true. Once prices are determined output is limited by demand.

Fourthly, several predictions made by neo-classical economic theory are contradicted by reality. For instance, capital-output ratios do not vary widely from country to country in spite of considerable differences in capital intensities. Furthermore, profit rates, net of risk allowance, are very much the same in all capitalist countries no matter whether capital intensities are high or low.

Fifthly, the level of employment does not, as will become apparent later on, increase as the real wage rate falls and vice versa. The reason is of course that, for an economy as a whole, wages are not only a component of cost but they also provide for the bulk of effective demand.

Finally, we should mention that the neo-classical theory of profit has been criticized on logical grounds. Sraffa [1960] has shown that the notion of the quantity of capital has no meaning for the economy as a whole independently of the rate of profit. The marginal product of capital as calculated from an aggregate production function therefore does not exist.

Accepting this criticism, neo-classical economists have then argued that true neo-classical theory is represented by the general equilibrium model and not by the aggregate production function version. But the former model describes only a temporary equilibrium situation where profit rates, though equal to the corresponding marginal products of capital, are not the same in all industries. Any attempt to bring about a long-run equilibrium where the rate of profit is the same
throughout the economy by the supply and demand mechanism must fail because capital in value terms is not independent of the rate of profit. This means that, because of the fact that there is no demand function for capital for the economy as a whole, it is logically impossible that the long-run rate of profit be determined by the supply and demand for investible funds (see on this point Garegnani [1970]). Of course, this difficulty may be overcome by assuming perfect foresight. But, as we shall argue below, in doing so every link with the real world is broken and the analysis, though logically correct, becomes irrelevant.

To the various reasons supporting the classical approach to distribution and contradicting the neo-classical one we can add another reason which is directed in a more general way against the neo-classical theory of distribution, or better, against neo-classical economic theory, that is the general equilibrium model. This theory, we think, is in fact not a description of reality but a description of an imaginary situation, an equilibrium situation of an economy made up of a certain number of mutually independent profit or utility maximising individuals having the same political power, namely none. (This implies, of course, that “society” has no real content, but is just a word.) Furthermore, perfect foresight is usually assumed in order to give a meaning to the notion of capital.

The theorems established by neo-classical theory represent, then, only logical truth (internal consistency) and not truth in the real sense of the word characterized by the correspondence (or attempted correspondence) of “what is” and of what is thought of “what is”. The main characteristic of logical truth is that it is necessary truth but also that it holds only within the framework of assumptions which are made a priori and are, therefore, independent of reality.

In our opinion there are at least two assumptions underlying neo-classical economic theory which are crucial and influence all the conclusions drawn from this theory.

One is given by perfect foresight and perfect information. This assumption implies that neo-classical theory abstracts from space and time.

Another crucial assumption concerns society and individuals. Society is, in a general equilibrium framework, made up of a certain number of individuals which are basically independent of each other. The only links between them are links of economic self-interest. Power is equally spread over all individuals. In addition, each individual has a self-identity which it is perfectly conscious of and which remains invariant as time goes by. If this were not so, then the notion of marginal utility would become meaningless.

Because of these two crucial assumptions neo-classical economic theory ignores uncertainty and expectations, historical developments and social and political relations. If economics is to be understood as a social science rather than as an exercise in logic, then it cannot be built on the before-mentioned assumptions.

For all the reasons presented above we therefore reject the theory that the rate of
profit is determined by demand and supply of capital. Instead we adopt the view that the rate of profit is determined by economic, social and political factors which have developed historically, such as relative power of workers and property owners, the intensity of competition and so on. We call the rate of profit determined in this way the *desired or normal* rate of profit, desired because entrepreneurs want to realise it. This rate of profit is defined as follows:

\[ \bar{g} = i + \bar{g} + \delta, \]  

where \( i \) is the real rate of interest, \( \bar{g} \) is the net rate of profit and \( \delta \) is the rate of depreciation. In long-run equilibrium \( \bar{g} \) will be a constant. If the notion of a constant desired rate of profit is to be economically meaningful, however, two conditions must be fulfilled. The first is given by the long-run stability of the economic system because only in this case will the desired rate of profit coincide with the expected rate of profit. Long-run stability of an economy guarantees the possibility that entrepreneurial expectations are, by and large, fulfilled.

The second condition is that entrepreneurs must be able to foresee broadly changes in techniques. We think that this condition is more or less fulfilled in the real world: Technical progress in the economic sense (innovations) is determined by the progress in the Sciences (inventions). It is a logical necessity that innovations can only occur after inventions have been made. Now, most entrepreneurs know approximately what is going on in the Sciences and, therefore, also know whether new inventions are imminent or not. In fact, large enterprises even have their own Research & Development department. Given this situation, entrepreneurs are in a position to anticipate technical change. Even if some of them cannot do so because of a lack of information, past experience is rough guide of what is going to happen in the future.

Given then the notion of the normal rate of profit we are in a position to say something about the concepts of technical choice (the determination of \( \alpha \) and \( k \)) and of technical progress (changes in \( \alpha \) and \( k \)). The concept of technical choice can best be discussed by the help of diagram 2.

Each curve in this diagram represents the real wage-rate of profit trade-off associated with a certain technique of production. Each technique of production, in turn, represents a basic system in the sense of Sraffa [1960].

Now, we know from what has been said above that the normal (net) rate of profit, \( \bar{g} - \delta \), is determined by factors outside the economic system. Figure 2, on the other hand, tells us that, once the (net) rate of profit is known, the technique of production that is chosen by entrepreneurs is also known. If the methods of production which

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7 In fact, it is \( \bar{g} + i \) which is determined outside the economic system. It is this magnitude which tends to equality in all sectors of the economy and is constant in the long-run. The latter is true of \( \bar{g} \) also because \( \delta \) is a given constant. But \( \bar{g} \) need not be equal in all branches of production, the reason being that \( \delta \) may have a different value in each branch.
are open to choice are given by curves I, II and III as mapped out in figure 2, then technique I will be selected. Given the rate of profit, $q^* - \delta$, and the money wage rate this technique allows to produce a given output in the cheapest possible way. This is reflected in the highest possible real wage rate, $\hat{w}^*$, that can be paid by entrepreneurs. Competition among entrepreneurs will ensure that technique I is chosen. Suppose for example that, given $q^* - \delta$ and the money wage rate $\hat{w}$, some entrepreneurs choose method III. These entrepreneurs will have to charge higher prices than those who have selected technique I if they want to realise the normal rate of profit. This is reflected in a lower real wage rate, $\hat{w}^{**}$ namely. But it is impossible to produce the same goods at higher prices in the long run. The entrepreneurs in question would be driven out of business unless they adopt technique I.

Therefore, as a general rule, entrepreneurs choose that technique of production which permits them to realise the normal rate of profit and to pay the highest possible real wage rate. This is just another way of saying that methods of production are, given the rate of profit, chosen in a way as to minimise costs. There are, however, important restrictions to the application of this rule. The best possible technique is determined by the state of knowledge in the Sciences. Technique IV in fig.2 might represent this technique. But entrepreneurs do not always choose the
best technique. Let us briefly explain why this may be so. There is one immediate reason: the lack of know-how. If there are not enough skilled workers, engineers and managers, then firms will not be in a position to introduce sophisticated techniques of production.

The size of firms is a further factor putting a restriction upon the choice of techniques. Small firms may be unable to find the initial financial capital necessary to the introduction of advanced techniques of production.

This leads us to another determinant: The state of the banking system. If modern techniques of production are to be introduced, then firms may have to borrow large sums to be able to do so. But the availability of credits may be severely limited by a badly developed banking system.

However, the most important factors determining the introduction of advanced techniques of production are given by the size of the market and by the structure of the market. Both are complementary to each other.

If the number of units of output that can be sold is large, then methods of large scale production associated with low unit costs can be introduced. The size of the market need not, of course, be confined to the domestic market. The ability of a certain country's firms to sell abroad is a very important determinant of the size of the market.

Given, then the size of the market, the structure of the market also plays an important role in determining the kind of techniques which are going to be in use. A rough indicator of the structure of the market is the number of firms. If the number of firms is too large in relation to the size of the market, then the market share for the individual firm will be small and there will not be much scope for the introduction of more productive techniques. But this does not imply that, given the size of the market, the smallest possible number of firms represents the best state of affairs in what concerns the introduction of new techniques. On the contrary, if the number of firms is too small, then technical progress may be slowed down because of a lack of competition. It seems therefore to be the case that, given the size of the market, there exists an "optimal" number of firms in the sense that the fastest possible pace of technical progress be generated.

From what has just been said it is clear how the rate of technical progress is determined: Progress in the Sciences leads to an outward shift of the real wage rate-rate of profit trade-offs. The rate of growth of labour productivity (\(\dot{a}/\alpha\)) then depends upon the ability of entrepreneurs to make use of the new techniques. This, in turn, depends on the factors mentioned before.

Having described the way in which the rate of profit and the natural rate of growth, defined as the sum of the rates of growth of labour productivity and of population, are determined, we are now in a position to describe the long-run behaviour of a typical capitalist economy. This will be done in the following three sections.
5. A Long-Run Model Without Autonomous Expenditures

In this section we intend to describe the functioning of a capitalist economy in the long run under the assumption that no autonomous expenditures are made. This assumption is usually made in all simple models of economic growth. The results which we shall obtain with our model can therefore immediately be compared with those of other growth models.

In order to simplify the analysis three additional assumptions are made:

a) In every period of time short-run equilibrium prevails. This means that the general price level is always such as to equalise aggregate supply and demand. The condition for this to happen is given by equation (9) and the way in which the short-run equilibrium is brought about is explained in fig. 1.

b) To bring our model into line with other growth models we define gross national output, aL, as net of rent. This provisional assumption is equivalent to putting R in definition (7) equal to zero.

c) In this and in the following sections we assume that α and k are always valued at prices determined by the current money wage rate and the normal rate of profit, that is at “natural prices”. In reality, these prices will, of course, not always be realised but there will be a tendency of actual prices towards them if the long-run equilibrium is stable.

Assumption a) implies that, in the long run, employment always equals full-capacity employment L. This is a reasonable assumption because in the long run there cannot be any excess capacities for the economy as a whole.

In describing the short-run equilibrium position of a capitalist economy (section 3) we did not say in what way the level of full capacity employment L was determined. The main purpose of this and of the next section is to explain the determination of L. To be able to do so, it will turn out to be convenient to look at relationships relating the amount of gross profits to the level of employment.

From equation (8) we can, using definition (7), derive an equation relating realised profits to the level of full capacity employment:

\[
\hat{\bar{\Pi}} = \frac{I}{s_\pi - s_w} - \frac{\alpha s_w}{s_\pi - s_w} L. \tag{11}
\]

In this equation \(\hat{\bar{\Pi}}\), I and \(\alpha L\) are growing at the natural rate of growth\(^8\)

\[
n = p + \dot{\alpha}/\alpha, \tag{12}
\]

where p is the rate of growth of the labour force L.

\(^8\) To simplify the notation we have omitted the time subscript throughout this note.
The initial value of $L_0$ in equation (11) is given by past accumulation:

$$L_0 = (1/k) K_0.$$  

Equation (11) represents the short-run equilibrium condition which must be fulfilled in every subperiod of the long run. In fact, this equation says, as has already been mentioned in section 3, that, given the level of employment, there exists only one distribution of income at which short-run equilibrium in the goods markets is possible. In every period of time total supply, given by $aL$, is confronted with effective demand made up of expenditure on consumption and investment. If supply exceeds demand, prices and profits fall and vice versa.

The question now is, whether, given the level of full capacity employment $\bar{L}$, realised profits fall short of, are equal to or exceed desired profits. Desired profits are given by

$$\hat{\Pi}^* = \varrho^* k\bar{L}.$$ (13)

$\varrho^*$ is, as has been said in section 4 (definition 10), the desired rate of profit made up of the rate of interest, the rate of depreciation and the net rate of profit.

Equations (11) and (13) form a system of two equations and two unknowns, $\hat{\Pi}$ and $\bar{L}$. It can immediately be seen that there must exist a unique solution for these two equations yielding equilibrium values for profits in real terms and the level of employment (Point C in fig. 3).
It is important to remember that in equations (11) and (13) all the variables \( I, \hat{I}, \alpha L \) and \( kL \) are growing at the natural rate of growth. The proportions of all the variables shown in fig. 3 will therefore remain unchanged in the course of time if the ratio of employed to full employment labour force, \( \frac{E}{E_f} \), does not vary. (Of course, if \( \frac{E}{E_f} \) increases or decreases, then the rate of growth of investment, capital and full capacity employment must temporarily exceed or fall below the natural rate of growth.) If employment is at a level at which realised profits exceed desired profits \( (\bar{L} < \bar{L}^* \text{ in fig. 3}) \), then entrepreneurs will invest more because their expectations have been more than fulfilled. The contrary is true if realised profits fall short of desired profits \( (\bar{L} > \bar{L}^*) \) and expectations, therefore, have not been fulfilled. In the case where realised profits equal desired profits entrepreneurs are satisfied and try to keep the level of investment and of employment stable.

The investment function we assume to exist is therefore the following:

\[
\Delta I = q (\hat{I}_{t-\tau} - \hat{I}_{t-\tau}^*) + nI. \tag{14}
\]

\( \hat{I}_{t-\tau} \) is the weighted average of the amounts of realised profits over a period \( t - \tau \) where the amount of realised profits in each year is given by equation (11). (The period \( t - \tau \) might be called "experience period". Firms base their decisions concerning the long-run future upon what has happened in this period and upon long-run expectations.) Similarly, \( \hat{I}_{t-\tau}^* \) represents the weighted average of desired amounts of profit over the same period. In each year desired profits are given by equation (13).

The magnitude of the adjustment parameter \( q \) (a positive constant) is determined by various factors of which the rate of interest, the availability of credit and expectations about the future are perhaps the most important.

Basically, equation (14) tells us that investment decisions are of a long-run nature. Events which have occurred in several successive short-run periods (years) are taken into account. Thus, a sudden deviation of considerable magnitude of realised from desired profits will, according to relation (14), have a very limited influence upon the level of investment. If entrepreneurs are to change the level of investment substantially, then there must have been a deviation of realised from desired profits over several short-run periods. Furthermore, they must expect this deviation to continue in the future, a fact that is reflected in a positive value of the adjustment parameter \( q \).

The second term on the right-hand side of equation (14), \( nI \), simply says that in dynamic equilibrium \( (\hat{I}_{t-\tau} - \hat{I}_{t-\tau}^* = 0) \) investment is growing at the natural rate of growth.

Let us now assume that the levels of employment and investment are such, namely \( \bar{E}^* \) and \( I^* \) (see fig. 3), as to equate the realised and the desired rate of profit. An equilibrium of this kind may or may not be a long-run equilibrium. The reason is
that every level of investment, if undertaken over several short-term periods of time, is associated with a certain level of employment. This is just another way of saying that employment in a certain period of time is determined by past accumulation.

The definition linking employment to gross domestic investment in the long run is the following:

$$I = (n + \delta)kL.$$ (15)

This definition can now be inserted into the short-run equilibrium condition (11) so as to yield a long-run relationship between realised profits and employment:

$$\dot{N} = \left[ \frac{(n + \delta)k - s_w \alpha}{s_w - s_w^2} \right] L.$$ (16)

As the magnitude of $s_w$ exceeds that of $s_w^2$, $(n + \delta)k - s_w \alpha$ must be positive. If this condition were not fulfilled profits would be zero or negative. This, obviously, is impossible because no accumulation would then take place.

An economic interpretation of relation (16) can only be given if it is seen together with the short-run equilibrium condition (11). The former equation says that, if a given amount of investment is undertaken over successive short-run periods, then a certain stock of capital is built up. The size of this capital stock, in turn, determines the level of employment which is given by the intersection of (11) and (16) (Point B in fig. 3). The problem now is that the level of employment created by a certain stream of investments, $I^*$, over successive short-run periods ($L_1$ in fig. 3) may or may not correspond to the level of employment at which the desired rate of profit is realised ($L^*$ in fig. 3). In fact, there is only one case where the two levels coincide, namely when the slopes of equations (13) and (16) are the same:

$$\varrho^*k = \frac{(n + \delta)k - s_w \alpha}{s_w - s_w^2}.$$ (17)

The desired rate of profit is, in this case, always realised regardless of the level of employment. Full employment can eventually be reached simply by persuading entrepreneurs to invest more at a given desired rate of profit. Their profit expectations would always be realised.

The situation is even more favourable if

$$\varrho^*k < \frac{(n + \delta)k - s_w \alpha}{s_w - s_w^2}$$ (18)

holds. This condition says that the slope of equation (16) exceeds that of equation (13). In this case, realised profits always tend to exceed desired profits regardless of the level of investment undertaken by entrepreneurs. Once full employment is reached the desired rate of profit has to adjust to the realised rate of profit.
The economic reason why in the case just described a cumulative process of growth takes place is that effective demand is not placing a constraint on growth. This can be seen more clearly by writing the condition on the slopes of equations (13) and (16), given by inequality (18), in the following way:

\[ s_w \alpha + (s_w - s_w) \varphi^* k < (n + \delta) k. \]  

(19)

There is a continuous tendency of investment to outrun the amount of savings available if prices are such as to yield the desired rate of profit. The only way in which savings can be adjusted to the amount of investment entrepreneurs are willing to undertake is by fixing higher prices. This will cause realised profits to rise above desired profits.

We now turn to the case where the slope of the line representing equation (16) is smaller than that of (13), the case mapped out in fig. 3. The condition on the slopes can be written as follows:

\[ s_w \alpha + (s_w - s_w) \varphi^* k > (n + \delta) k. \]  

(20)

This inequality states that, whenever entrepreneurs fix prices in a way as to achieve the desired rate of profit, savings will exceed investment. Therefore, prices and profit margins have to be lowered. This means that there will be a continuous tendency for realised profits to fall short of desired profits. If an amount \( I^* \) which is growing at a rate \( n \) is invested over successive short-term periods, then a level of employment \( L_1 \) will obtain. But at this level of employment realised profits fall short of desired profits by an amount \( AB \). According to relation (14) entrepreneurs will now invest less. As a consequence, the ratio of employed to total labour force will become smaller as time goes by. Obviously, at some stage this process has to come to a halt. Investment and employment have to stabilise at a certain level and the desired rate of profit has to adjust to the realised rate of profit.

The conclusion to be drawn from the analysis carried out in this section is that the growth path of capitalist economies tends to be highly unstable. The only exception to this rule is given by the unlikely case where the desired rate of profit equals the realised rate for all levels of employment (condition 17). The analysis of this section therefore confirms that the dynamic equilibrium of growing capitalist economies seems to be a knife-edge equilibrium, a proposition that has been put forward by R. F. Harrod as early as in 1939 (see Harrod [1939]). But it is important to note that this conclusion is only valid if no autonomous expenditures are made.

The instability of the system cannot be removed by adjustments in the capital-output ratio \( v \) in order to bring about a solution to the long-run equilibrium condition

\[ s/v = n \]  

(21)  

(\( s = \) net investment-income ratio)
as neo-classical economists have proposed. The reason is, as has been mentioned in section 4, that there does not exist an aggregate demand function for capital. This, in turn, is due to the fact that anything may happen to the capital-labour ratio and to the capital-output ratio if a change in the rate of profit occurs. For instance, if there is unemployment then, according to neo-classical theory, the real wage rate falls and the rate of profit increases. This implies a fall in the capital-output ratio and in the capital-labour ratio which means that labour is substituted for capital. This process comes to an end when unemployment is reduced to zero. In terms of equation (21) the mechanism just described is reflected in $s/v$ exceeding $n$. This implies that the actual rate of growth of the capital stock exceeds the natural rate. Unemployment is reduced, therefore, because the labour force is growing at a rate $n$.

However, Sraffa [1960], Garegnani [1970] and Pasinetti [1966] have, together with others, shown that it is perfectly possible for the capital-labour ratio and for the capital-output ratio to **increase** as the rate of profit increases, and vice versa. The implication of this is, of course, that there is no reason to suppose that the neo-classical adjustment mechanism can bring about full employment growth.

But not only the neo-classical adjustment mechanism is excluded in our model. The neo-Keynesian adjustment mechanism which brings about equality of savings and investment does not always work. The reason is that the distribution of income which is compatible with the equilibrium condition (21) may be such as to yield a rate of profit which is above or below the _desired_ rate of profit. In the case where the realised rate of profit exceeds the desired one (condition 19) there is no problem because the system tends towards full employment. If the contrary situation prevails, however, realised profits fall short of desired profits and there will be a tendency towards less and less employment whatever the initial level of employment happens to be (fig. 3 and condition 20). It is obvious that, in this case, the neo-Keynesian adjustment mechanism is of no use even if entrepreneurs invest an amount which brings about equality between realised and desired profits because this amount of investment will create future capacities so large that effective demand will not be sufficient to guarantee their full utilisation. This point can be seen more clearly by the help of fig. 3. If employment is at $\bar{L}_1$ and if entrepreneurs can be persuaded to invest an amount $\bar{I}$, then realised profits will equal desired profits. But, if this level of investment is sustained over several short-run periods, then the capacities created will be such as to employ more than $\bar{L}_1$ workers, $\bar{L}_2$ in fact, and realised profits will be depressed below the normal level in the long run.

The conclusion that the growth path of capitalist economies is unstable therefore seems unescapable once the neo-classical adjustment mechanism is not accepted. In the next section, however, we shall try to argue that this need not be the case and propose a new formulation of the model set forth in this section.
6. A Long-Run Model With Autonomous Expenditures

The basic instability of the growth model set forth in the previous section has a serious theoretical consequence: The notion of the desired rate of profit becomes meaningless if the system is totally unstable because, in such a situation, this rate of profit will never be realised and might therefore not even be defined. Thus, the notion of a desired rate of profit makes sense only if the system is stable in the long run.

Furthermore, when one looks at the long-run behaviour of capitalist economies, developed or underdeveloped, one has not the impression that these systems are highly unstable. One cannot observe in reality that some capitalist economies tend to have continuous full employment and others less and less employment. On the contrary, the picture is one of remarkable stability, at least for the period since the Second World War. Two large capitalist countries, Germany and Japan, enjoyed continuous full employment during the period in question. France's level of employment was always very near to full employment. Other countries, like Britain, the United States and Canada had continuously a certain amount of unemployment which did not change substantially in percentage terms. In underdeveloped capitalist countries the general picture has been one of stagnation with the ratio of unemployed to total labour force remaining more or less constant.

The fact that under capitalism the ratio of employed to total labour force is fairly constant over long periods of time requires a reformulation of the model put forward in the previous section. To do this is the purpose of the present section.

We think that there is an important factor, taken into account in the analysis of business cycles but usually neglected in the theory of economic growth, which, if introduced into our model would produce a stable long-run equilibrium associated with a certain level of employment which need not correspond to full employment. This factor is given by autonomous expenditures. Expenditures of this kind are not related to the level of income and employment but rather to total population, to the political situation that has been prevailing in the past and to external factors. Autonomous expenditures, then, are made up of government consumption and of the surplus of exports over imports.

It may not always be easy to separate government consumption from government investment, just as it is difficult to say what private consumption and private investment exactly consists of. Government investment might be defined as all government expenditure aimed at an increase in productive capacity. It consists of overhead capital and of directly productive capital. Government investment is, as has already been mentioned, included in total investment I. Government consumption, then, is given by all those government expenditures which have no "capacity effect", e.g. expenditures on social services, transfer payments and defense expenditures. All these expenditures making up government consumption are, as has been
mentioned above, independent of the level of employment. They mainly depend
upon the size of total population and upon institutional factors.

Denoting autonomous expenditures in real terms by \( A \) and bringing rent on
land, omitted in the last section, into the picture again, we can rewrite the short-run
equilibrium condition (8) in the following way:

\[
sw \alpha L + (s_r - s_w) (\hat{\delta} + \hat{\kappa}) = A + I. \quad (8a)
\]

The savings coefficients have now to be reinterpreted to include tax coefficients.
The former are then given by the following expressions:

\[ s_w = 1 - c'_w (1 - t_w) = t_w + s'_w (1 - t_w) \]
and
\[ s_r = 1 - c'_r (1 - t_r) = t_r + s'_r (1 - t_r). \]

\( t_w \) and \( t_r \) are the fractions of wage and property income paid on direct and indirect
taxes. \( c'_w \) and \( c'_r \) are then the fractions of disposable wage and profit income
consumed and \( s'_w \) and \( s'_r \) are the fractions of disposable income saved.

If one assumes that \( s_w \) and \( s_r \) are fairly stable in the course of time, then the
economic meaning of relations (22) is that the fraction of (total) real income
consumed is also stable. This is a reasonable assumption. One of its implications is
that a change in taxation may, given government expenditures, have no influence
on the economic system at all. For instance, if \( t_w \) goes up, then \( s'_w \) may decrease so as
to keep \( s_w \) and, therefore, \( c'_w (1 - t_w) \) constant. Only if \( s'_w \) were zero would a rising \( t_w \)
result in a larger \( s_w \), that is in reduced effective demand.

The introduction of autonomous expenditures and the reintroduction of rent on
land into the model require a modification to two of our three basic equations (11),
(13) and (16). They now become:

\[
\hat{\delta} = \frac{A + I - (s_r - s_w) \hat{\kappa}}{s_r - s_w} \quad \frac{s_w \alpha}{s_r - s_w} L, \quad (11a)
\]

\[
\hat{\delta}^* = \rho^* k L \quad (13)
\]
and

\[
\hat{\delta} = \frac{A - (s_r - s_w) \hat{\kappa}}{s_r - s_w} + \left[ \frac{(n + \delta) k - s_w \alpha}{s_r - s_w} \right] L. \quad (16a)
\]

Equation (11a) represents the short-run equilibrium condition relating employment
to realised profits. Relation (16a) links the same variables in the long run.
Both expressions are linked by the definition \( I = (n + \delta) k L \). Equation (13), finally,
relates employment to desired profits.
Together with the equilibrium condition $\dot{\Pi}^* = \dot{\Pi}$ these equations form a system of four equations and four unknowns: $\hat{\Pi}^*$, $\hat{\Pi}$, $\bar{L}$ and $I$.

The solution of the subsystem (13), (16a) and $\dot{\Pi}^* = \dot{\Pi}$ yields long-run equilibrium values for desired profits, realised profits and full capacity employment:

$$\bar{L}^* = \frac{A - (s_{\pi} - s_w)\hat{R}}{s_w\alpha + (s_{\pi} - s_w)q^*k - (n + \delta)k}$$  \hspace{1cm} (23)

and

$$\dot{\Pi} = \dot{\Pi}^* = q^*k\bar{L}^*.$$  \hspace{1cm} (24)

Another subsystem made up of (11a) and (16a) determines the long-run equilibrium amount of investment, $I^*$, that is needed to create the capital stock associated with the equilibrium level of employment $\bar{L}^*$.

Finally, the way in which equilibrium is reached is described by the difference equation (14).

Let us now map out the whole system in a diagram. This will enable us to describe the way in which a capitalist economy works in the long run.

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9 Let us repeat here that in equilibrium $A, I, \hat{R}, \hat{\Pi}$ and $\dot{\Pi}^*$ are growing at a rate $n, \alpha$ and $k$ at a rate $\dot{\alpha}/\alpha$ (if technical progress is neutral), $L^*$ at a rate $p$, and that time subscripts are omitted for simplicity's sake.
Line BB in this figure represents the short-run equilibrium condition of the economy we consider. This condition says that to each level of employment (as determined by past accumulation) and investment corresponds a certain amount of realised profits.

Line CC connects the same variables in the long run. Both lines are linked together by the definition $I = (n + \delta) k L$.

Finally, line 0D associates to each level of employment a certain amount of desired profits.

From fig. 4 it can be seen that the long-run equilibrium level of employment $L^*$ is determined by the intersection of lines CC and 0D (Point E). At this level of employment desired profits equal realised profits. The amount of investment that has to be undertaken over several short-run periods in order to create the capacities required to employ $L^*$ workers, namely $I^*$, is determined by the intersection of BB and CC.

It is easy to show that the equilibrium of the system depicted in fig. 4 is stable. Suppose for instance that, for one reason or another, the amount invested over several short-run periods has been smaller than $I^*$, say $I^{**}$. The short-run equilibrium condition is then represented by the line $B'B'$. The level of employment created by this stream of investments is given by $L^{**}$. But now realised profits exceed desired profits by an amount FG. According to relation (14) entrepreneurs will invest more and investment will increase. The rate of growth of capital and output will thus exceed the natural rate of growth $n$ for some time. This process will come to an end once the level of employment equals $L^*$. All the variables will then grow at the natural rate of growth again.

The reason why in this model, in contrast to the one set forth in the previous section, a stable equilibrium obtains is that autonomous expenditures do not vary with the level of employment.

A glance at fig. 4 shows us that the long-run equilibrium level of employment at which realised and desired profits coincide will correspond to the full employment labour force only by accident. Some of the means to be used in order to narrow the gap between $L^*$ and $L_f$ will be mentioned in the next section where we turn to the discussion of some implications of the model.

7. Some Implications of the Model

In the first place it is important to note that the equilibrium level of employment as given by equation (23) need never be realised in reality. This level of $L$ is determined once all the institutional, psychological and technical parameters contained in the expression on the right-hand side of (23) are determined. $L^*$ may thus change in the course of time if changes in these parameters occur.

What happens in capitalist economies is that employment will tend to $L^*$ by means of the mechanism described at the end of the previous section. $L^*$ is thus the
macroeconomic equivalent of the "natural price" of classical economic theory, which represents the microeconomic equilibrium in the various markets. Both equilibria are characterised by the fact that the realised rate of profit equals the desired rate and that all markets except the labour market are in equilibrium. The proposition that the long-run equilibrium position of capitalist economies is basically stable is not incompatible with more or less violent business cycles which we have not been concerned with in this note. The extent to which business cycles may occur mainly depends on how entrepreneurs react if realised profits deviate from desired profits, that is to say on the magnitude of the parameter q in relation (14). If q is large and realised profits exceed desired profits, then entrepreneurs will increase investment rapidly. A rise in the amount of investment, however, will itself cause profits to increase. This interaction between investment and profits (see on this relation (9) and fig. 1) may induce entrepreneurs to invest more than would be necessary to bring about the long-run equilibrium level of employment (Point E in fig. 4). At the time when the capacity effect of investment works out, entrepreneurs realise that they have invested too much and a downward movement of investment and employment is started.

Let us now, in what follows, briefly describe the effect of changes in the parameters contained in the expression on the right-hand side of equation (23) upon the equilibrium level of employment L*.

It is immediately clear that an increase in consumption relative to income as reflected in lower values of $s_w = t_w + s_w(1 - t_w)$ and $s_x = t_x + s_x(1 - t_x)$ results in a higher level of employment: Given the initial levels of employment, autonomous expenditures and investment, lower fractions of income saved and paid on taxes result in an increase in effective demand. Realised profits temporarily exceed desired profits. This, according to relation (14), causes investment and, therefore, employment to increase.

The most important implication of relation (23) is given by the fact that an increase in the share of property income in total income will result in a lower equilibrium level of employment. The reason is that the primary purpose of property income is not to guarantee a high level of consumption to those who get it but to make further accumulation of property possible. Thus $s_x$ is, as we have already mentioned, considerably higher than $s_w$. A rising share of property income is therefore, all other things being equal, associated with a lower level of effective demand and employment. From this follows that, if full employment is to be brought about in a capitalist economy, prices and profits (not real wages) have to be

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10 Of course, it may happen that the labour market be in equilibrium, too, if, accidentally, L* equals L_t.

11 One should note that an increase in the desired rate of profit (reflected in a steeper slope of line OD in fig. 4) is usually, but not necessarily, connected with an increase in the share of property income in total income. The share of property income may decline as $q^*$ increases if Wicksell effects are strongly negative. (See on these effects Harcourt [1972].)
kept down. Furthermore, the amount of investment necessary to equip the newly employed workers has to be undertaken. It is evident, however, that, when the rate of profit is falling, entrepreneurs will not invest more but less [see relation (14)]. The only way out of this dilemma would be increased government investment in the private sector. This, in turn, would result in a shrinking or even disappearance of the latter. Quite naturally, an employment policy of this kind would meet resistance from the capitalist class as a whole. Therefore, bringing about full employment by income redistribution is not an economic but a political problem.

In this context, one should note that the effects of an overproportional increase in rent upon the level of employment are somewhat more complex than is suggested by what we have just said: The value of land tends to rise as capital accumulation goes on. Now, property owners may expect the value of land to rise very rapidly. Therefore, they will invest more and more in land causing by this very action a rapid increase in the price of land. This has, as we can show by the help of our basic diagram 4, a particularly bad influence on the level of employment for two reasons.

First, it may, if the availability of credit is limited, depress productive investment because funds are, instead of being invested in new capital goods, invested in an unproductive way, namely in land. Employment will then be depressed because of a slowly growing capital stock. In fig. 4 this effect of property speculation is reflected in a downward shift of line BB.

Second, a fast increase in the rent on land depresses, as has been said above, effective demand and thus the level of employment. This effect of a rapid increase in the share of rent shows up in a downward shift of line CC in fig. 4.

Remembering that A in relation (23) contains government consumption and the balance of trade surplus, one may ask the question why it is not possible to increase the former until full employment is reached. The main reason why this cannot be done is related to time. Suppose that a government is willing to increase the level of employment by increasing its consumption and by thereby running budget deficits. Since there are, usually, no excess capacities for the economy as a whole, increased government consumption will result in a rise of profits and/or imports. Investment on the other hand may not increase at all in spite of the fact that realised profits now exceed desired profits. In order that entrepreneurs expand productive capacities, they must not only be confident about the future but realised profits must have exceeded desired profits for some time because otherwise entrepreneurs will consider the increase in the rate of realised profits as a short-lived event and investment decisions will not be influenced by it [see relation (14)]. Thus, a sudden increase in government consumption causes inflation and balance of payments problems which will eventually lead to an abandonment of the "expansion" policy.

From what has been said so far it is evident that a sustained tendency of exports to exceed imports plays a role of paramount importance in the behaviour of capitalist economies. Successful exporters will have a high average level of employment (e.g.
Germany and Japan) and vice versa. It should be noted that, in order to have a favourable impact on employment, it need not be the case that the balance of trade surplus be permanent. Exports may exceed imports for a certain period of time, causing output and employment to increase. In the next period, imports will rise due to a higher level of national income. It is possible that the process be self-repeating. The important thing about it is that imports adjust to exports and not that imports be limited by exports. Let us further mention that a technically dynamic economy characterised by high values of \( n \) and \( \delta \) has, ceteris paribus, a higher equilibrium level of employment than an economy with slow technical progress. The reason is that larger values of \( n \) and \( \delta \) result in a higher investment-output ratio which, in turn, is associated with a higher level of effective demand.

Finally, it is evident, as can be seen from formula (23), that non-neutral technical progress may have an influence upon the level of employment. Capital saving technical progress, which is due to the fact that the rate of technical advance in the capital goods sector exceeds the one in the consumption goods sector, is reflected in \( \alpha \) growing faster than \( k \). The opposite holds if technical progress is capital using. The effects of both types of progress on the level of employment are not clear cut. On the one hand, capital saving technical advance results in an increase in the share of wages in income which means that effective demand increases. On the other hand, this type of progress is associated with a lower investment-output ratio which results in a lower level of effective demand. It is impossible to say, a priori, what the net effect will be because this is, evidently, an empirical question. The same is true of capital-using progress which lowers the share of wages in income but results in an increase in the investment-output ratio.

To end this section we should perhaps mention a possible objection which could be levelled against the kind of analysis carried out in the last section. One might argue that \( \alpha \) and \( k \) are only defined if the economic system is in a state of long-run equilibrium (Point E in fig. 4). This would be true if the desired rate of profit were not a constant (in neo-Keynesian models, for example, \( \phi^* \) is usually considered to be dependent upon the investment-output ratio). However, if \( \phi^* \) is determined outside the economic system, then the prices of production and, therefore, \( \alpha \) and \( k \) are always defined even if short-run fluctuations in demand occur. Fluctuations of this kind will, in general, leave prices unaffected and will show up in unused capacities or in an increase in orders above the normal level. Even if, as we have assumed in our model for analytical convenience, adjustments are brought about by price changes, these changes would affect a small part of output only. Clearance sales are a case in point.\(^{12} \)

\(^{12} \) Of course, short-run deviations of the rate of profit from \( \phi^* \) should not be confused with changes in \( \phi^* \) itself. The latter are of a long-run nature and are associated with a different technique of production (\( \alpha \) and \( k \) will change with \( \phi^* \) and nothing can be said, a priori, on the nature of that change). Thus, a new \( \phi^* \) results in a new long-run equilibrium position.
8. Conclusions

In this article we have tried to show that the consumption behaviour of workers and of capitalists, the distribution of income, the level of autonomous expenditures and the intensity and the nature of technical progress are the most important determinants of the long-run equilibrium level of employment in a capitalist economy (sections six and seven). It has been found that this level of employment, which need not correspond to full employment, is basically stable. Stability has been obtained by introducing autonomous expenditures into the model (see sections five and six).

The main point we wanted to make was that, together with the balance of trade surplus, the distribution of income is the most important single factor influencing the long-run equilibrium level of economic activity. If there is persistent unemployment, then the most effective means to bring about a higher level of employment is to raise real wages, above all those of low-paid workers, because workers in general and low-paid workers in particular spend a much higher proportion of their income on consumption than people who receive mainly property income. This conclusion which has been arrived at by looking at an economic system as a whole, is, needless to say, in direct contradiction to any micro-economic theory of employment which asserts that a higher level of employment is associated with a lower real wage rate.\textsuperscript{13}

Symbols used

\begin{itemize}
  \item[A] = Autonomous expenditures (government consumption and balance of trade surplus) in real terms, that is in terms of a bundle of consumption goods produced in fixed proportions
  \item[I] = Gross private and public investment in real terms
  \item[K] = Capital stock in real terms
  \item[L] = Labour force measured in man-years
  \item[L_f] = Level of employment at which the existing stock of capital is fully utilised
  \item[L_f] = Full employment labour force
  \item[O] = Gross domestic product in real terms
  \item[P] = General price level represented by the money price of the \textit{numéraire} (the bundle of consumption goods)
  \item[\bar{R}] = Rent on land in money terms
  \item[\bar{R}] = Rent on land in real terms
  \item[Y] = Gross domestic income in money terms
  \item[c_w] = Fraction of wage income consumed
  \item[c_n] = Fraction of property income consumed
  \item[k] = Capital intensity (K/L)
  \item[n] = Natural rate of growth (p + \bar{a}/\bar{s})
  \item[p] = Rate of growth of population
  \item[q] = Reaction coefficient of investment in response to a deviation of realised from desired profits
  \item[s_w] = Fraction of wage income saved
  \item[s_n] = Fraction of property income saved
\end{itemize}

\textsuperscript{13} Solow and Stiglitz [1968] arrive at a similar conclusion for a certain range of the real wage rate. Their analysis is, however, strictly confined to the short run.
\( \bar{w} \) = Money wage rate
\( \dot{w} \) = Real wage rate
i = Rate of interest
\( \alpha \) = Labour productivity
\( \delta \) = Rate of depreciation
\( \theta^* \) = Desired or normal gross rate of profit
\( \theta \) = Net rate of profit
\( \Pi \) = Gross profits in money terms
\( \Pi^* \) = Gross profits in real terms
\( \Pi^* \) = Desired or normal gross profits in money terms
\( \Pi^* \) = Desired or normal gross profits in real terms
\( \bar{\Pi}^*_t \) = Weighted average of the realised amount of profit over the period \( t - \tau \)
\( \bar{\Pi}^*_t \) = Weighted average of the desired amount of profit over the period \( t - \tau \)

Additional symbols used from section six onwards

\( s_w \) = \( t_w + s_w^* (1 - t_w) \)
\( s_n \) = \( t_n + s_n^* (1 - t_n) \)
\( s_w^* \) = Fraction of disposable wage income saved
\( s_n^* \) = Fraction of disposable property income saved
\( t_w \) = Fraction of wage income paid on taxes (direct and indirect)
\( t_n \) = Fraction of property income paid on taxes (direct and indirect)

References


Zusammenfassung

Über die Bestimmung des langfristigen Beschäftigungsniveaus in einer wachsenden kapitalistischen Wirtschaft

In diesem Artikel wird gezeigt, dass in einer kapitalistischen Wirtschaft ein langfristig stabiles Beschäftigungsgleichgewicht bestehen kann, das nicht dem Vollbeschäftigungsniveau entsprechen muss. Die wichtigsten Faktoren, die dieses Beschäftigungsniveau bestimmen, sind die Einkommensverteilung und die Handelsbilanzsituation: Das Gleichgewichtsbeschäftigungs niveau ist um so höher, je größer der Lohnanteil am Volkseinkommen und der Handelsbilanzüberschuss sind.

Résumé

La détermination du niveau d'emploi à long terme dans une économie capitaliste croissante

Le but de cet article est de montrer que, dans une économie capitaliste, il est possible qu'un niveau d'équilibre de l'emploi, qui est stable à long terme et qui ne correspond pas au niveau de plein emploi, puisse exister. Les facteurs les plus importants qui déterminent ce niveau d'emploi sont la distribution du revenu et le surplus des exportations sur les importations: Le niveau d'équilibre de l'emploi est d'autant plus élevé que la fraction du revenu destinée aux travailleurs et le surplus des exportations sur les importations sont plus larges.

Summary

On the Determination of the Level of Employment in a Growing Capitalist Economy

The purpose of the article is to show that, in a capitalist economy, there may exist a stable long-run equilibrium level of employment which need not correspond to full employment. It is argued that the distribution of income and the balance of payments position are the most important determinants of the level of employment: A higher share of wages in total income and a tendency of exports to exceed imports result in a higher equilibrium level of employment.