sistent with a state of affairs where the level of employment has "no rapid tendency to alter." Since the long rate adjusts itself to the short only very slowly, the answer seems to be in the affirmative.   N. KALDOR

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A THEORY OF PROFITS

I

1. IN this paper we attempt to investigate the determinants of profits in short and long periods. The short-period analysis will consist in relating the profits in a given short period to certain factors operating in the preceding periods. From this we shall pass to the examination of the level of the rate of profit in long periods, in particular in relation to the rate of interest.

We abstract in our argument from the influence on profits of the balance of foreign trade and the Budget deficit (or surplus). We therefore assume a closed system and a balanced State Budget. It is consequently quite clear that our conclusions are by no means applicable to a war economy. Our aim is, on the contrary, to examine the problem of profits in a closed *laissez-faire* system. In concert with abstracting from the Budget deficit we also assume that no interest on National Debt is paid.

By gross profits we shall mean depreciation and net undistributed profits, dividends, interest, rent and also managerial salaries, all *after payment of direct taxes*.[1] The receivers of this type of income we call capitalists. The rest of incomes are wages (also taken net of direct taxes) and doles. The saving out of these incomes is assumed to be small, and is neglected for the sake of simplicity—*i.e.*, equated to nought.

2. We shall now establish the fundamental equation between profits on the one hand and capitalists' consumption and private investment on the other. We must, however, first define certain concepts. By gross investment we shall mean the value of all sales of newly produced fixed capital equipment + increase in working capital and stocks; and by gross national income the sum of total personal consumption [2] and gross investment. We shall distinguish private and Government investment (armaments, Government buildings, etc.). The gross national income so defined is, as may easily be seen, also equal to profits gross of depreciation and net of direct taxes + wages (also net of taxes) and doles, + Government investment. For the

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[1] However, taxes accruing but not yet paid—*i.e.*, increase in tax reserves *are* included in profits.

[2] Exclusive of that of Government services.

proceeds of sales of consumption and investment goods [1] will be received by capitalists and workers employed by them, or passed by means of indirect and direct taxes to the Government, which will, in turn, spend the revenue either on wages of Government-employed workers and doles or Government investment. We thus have the following " balance sheet " of national income and expenditure :

Gross profits (gross of depreciation but net of direct taxes) Wages and doles (net of direct taxes) Gross Government investment	Total gross investment Capitalists' consumption Workers' consumption
Gross national income	Gross national income.

Now, since wages and doles are, as assumed above, fully spent on consumption, and total gross investment — gross Government investment = gross private investment, it follows directly that :

$$\text{Gross profits} = \text{Gross private investment} + \text{Capitalists' consumption.} \tag{1}$$

What is the proper meaning of this equation ? Does it mean that profits in a certain period determine capitalists' consumption and investment, or the other way round ? The answer to this question depends on which of these quantities is directly subject to the decisions of capitalists. Now, it is clear that they may decide to consume and to invest more in a certain short period than in the preceding period, but they cannot decide to earn more. It is therefore their investment and consumption decisions which determine profits, and not the other way round.

If the period which we consider is short, we may say that capitalists' investment and consumption are determined by decisions formed in the *past*. For the execution of investment orders takes a certain time, and as to the capitalists' consumption, it is only with a certain delay that the capitalists' standard of living reacts to the change of factors which influence it.

If capitalists decided always to consume and to invest in a given period what they have earned in the preceding period, the profits in the given period would be equal to those in the preceding one. In such case they would remain stationary, and the problem of how to read the above equations would lose its importance. But such is *not* the case. Although profits in the preceding periods are one of the important determinants of capitalists' consumption and investment, capitalists in general do *not* decide to consume and invest in a given month what they have earned

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[1] The latter inclusive of the increase in working capital and stocks. When this type of investment does not actually involve a sale, it may be considered as a firm's sale to itself.

in the preceding one.   This explains why profits are *not* stationary, but fluctuate in time.

3. The above argument requires a certain qualification. The past investment decisions may not fully determine the volume of investment in a given period, owing to unexpected accumulation or running down of stocks.   The importance of this factor seems, however, to have been frequently exaggerated.   It has rather the character of friction, and the primary determinant of profits in a short period remains the past decisions of capitalists as to their consumption and investment.

A second qualification arises out of the fact that these decisions will usually be in real terms, and in the meantime prices may change.   For instance, a piece of ordered capital equipment may cost more than at the period when the order was given.   To get over this difficulty it will be convenient to deflate both sides of the equation by appropriate price indices.   We thus obtain an equation between real gross profits and real capitalists' consumption + real gross private investment.

We may now conclude that the real gross profits in a given short period are determined by decisions of capitalists as to their consumption and investment formed in the past, subject to the correction for the unexpected changes in the volume of stocks.

There arises here the problem what will be the place of the factors determining the distribution of the national income in this theory.   Since profits in a given short period are determined by capitalists' decisions as to their consumption and investment formed in the past, the factors determining the distribution of income will affect not real profits but the real wage bill, and consequently the national output.   If, for instance, the degree of monopoly increases, and, as a result, so does the ratio of profits to wages, real profits do not change, but the real wage bill falls, first because of the fall in real wage rate, and secondly because of the consequent reduction in demand for wage goods, and thus of output and employment in the wage-good industries.   Profits per unit of output increase, but the national output falls just so much that, as a result, the real total profits remain the same.   However great the margin of profit on a unit of output, the capitalists cannot make more in total profits than they consume and invest (inclusive of accumulation of unsold goods).[1]

[1] The theory of profits presented here is closely allied to Mr. Keynes' theory of saving and investment.   It has been, however, developed independently of Mr. Keynes in my " Essai d'une théorie du mouvement cyclique des affaires," *Revue d'économie politique*, Mars–Avril 1935 and " A Macrodynamic Theory of Business Cycles," *Econometrica*, July 1935.

4. The above analysis obviously cannot answer the question why the rate of profit taken as average for longer periods is higher than the rate of interest. It only relates profits in a given short period to capitalists' consumption and investment in this period determined by factors which operated in the preceding periods. To say something about the actual level of profits it is necessary to apply a different type of analysis.

II

1. The long-run analysis is often conducted under assumption of long-run equilibrium *sensu stricto* (*i.e.*, in the sense that the system is at rest). This is entirely unjustified, because we *know* that apart from cyclical fluctuations the economic system is subject to a complex process of long-run development. We shall therefore approach the problem from a different angle : we shall simply consider connections between averages of variables in a period extending over a full business cycle and chosen so that its beginning and end are positions half-way between boom and slump.

We shall assume that the average change of any variable per year of our period is small as compared with the average of this variable over this period. That means that if the period considered consists of years 1, 2, 3, . . . n, and is preceded by a year o, we assume for any variable X that $\dfrac{X_n - X_o}{n}$ is small as compared with $\dfrac{X_1 + X_2 + X_3 \cdots X_n}{n}$. This condition is likely to be fulfilled in reality, since our period covers a full cycle and the economic development after elimination of the trade cycle is usually " slow."

The assumption of the " slowness " of long-run economic development is of great significance for the long-period analysis. Indeed, when short periods are considered, any relation between two variables involves time lags. For instance, investment at a given moment is a function of factors which operated some time ago. Now, if these time lags are short—say, not greater than of an order of a year—they may be disregarded in our long-period analysis. For, since $\dfrac{X_n - X_o}{n}$ is small as compared with $\dfrac{X_1 + X_2 \cdots X_n}{n}$, the latter differs little from

$$\frac{X_o + X_1 + \cdots X_{n-1}}{n};$$

thus, when the influence of X upon the situation in a given long

period is examined, we shall make only a small error taking into consideration the former instead of the latter.

2. In every year of our period gross profit is equal to capitalists' consumption + private gross investment. For the sake of brevity we shall use below " investment " for private investment. Thus the average gross profit is equal to the average capitalists' consumption + average gross investment. If we deduct from both sides of this equation the average maintenance and depreciation, we find that the average net profit $\bar{P}$ is equal to the average capitalists' consumption $\bar{C}$ + the average net investment $\bar{I}$:

$$\bar{P} = \bar{C} + \bar{I} \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

where $\bar{C}$ and $\bar{I}$ are understood here to be expressed in real terms—namely, calculated at prices prevailing at the beginning of the period considered, and also $\bar{P}$ is the average " real " profit.

We may make the following plausible assumption about the " real " capitalists' consumption C_t in a given year : that it consists of a stable part A and a part proportionate to the real profit $P_{t-\theta}$ of some time ago :[1]

$$C_t = A + \lambda P_{t-\theta}. \quad . \quad . \quad . \quad . \quad (3)$$

θ indicates thus the delay of the reaction of capitalists' consumption to the change in their current income ; it is probably of an order of a year or less. λ is positive and <1.[2] Finally, A is the result of habits acquired by capitalists as a result of past long-run development. It changes, therefore, slowly in time, also in the period considered, but the time lags involved are very long, and therefore we shall assume A in the period considered (which, covering a full cycle, is about 10 years long) to be determined by factors which operated prior to it. We take now the average of both sides of our equation (3) over our period. Since the time lag θ is relatively short, it may be neglected according to the argument of the preceding paragraph. We thus obtain :

$$\bar{C} = \bar{A} + \lambda\bar{P} \quad . \quad . \quad . \quad . \quad . \quad (4)$$

and from this equation and equation (2) it follows :

$$\bar{P} = \frac{\bar{A} + \bar{I}}{1 - \lambda} \quad . \quad . \quad . \quad . \quad . \quad (5)$$

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[1] We neglect the influence of the rate of interest upon capitalists' consumption as not very important.

[2] A tentative estimate of λ for the U.S.A. in the period 1925–35 suggests that it was <0.33. (Undistributed profits were, of course, included in capitalists' incomes.)

where $\bar{A}$ depends on the development preceding the period considered.[1]

3. In order to obtain a formula for the average *rate* of profit in our period, we shall now consider the average volume of total capital in this period. Let K_o be the value of total capital equipment at current prices of investment goods at the beginning of this period. Since $\bar{I}$ is the average net " real " investment in our period at prices prevailing at the beginning of our period, the " real " capital at the end of the period is $K_o + n\bar{I}$, where n is length of the period.

Now, the deviations of the annual rate of investment from the average annual rate of investment $\bar{I}$ throughout the period may be assumed small as compared with the initial volume of capital equipment K_o. It may be shown that if this is the case then with $n = 10$ years the average volume of capital $\bar{K}$ will differ little from the average of its volume at the beginning and at the end of the period. We have thus as a good approximation

$$\bar{K} = K_o + \frac{n}{2}\bar{I} \quad . \quad . \quad . \quad . \quad . \quad (6)$$

4. We shall now obtain a formula for the average rate of profit in our period which we may determine as the ratio of average *money* profit to average *money* value of capital at current prices. Thus, before dividing $\bar{P}$ by $\bar{K}$, which are " real " values calculated at prices at the beginning of the period, they should be multiplied by appropriate price indices. It is, however, easy to see that this correction will be important only if the average of the price index of consumption goods related to the beginning of the period as basis differs from that of investment goods considerably. Since, however, the beginning of the period has been chosen in such a way that it represents a half-way position between boom and slump, this is unlikely to be the case, and therefore $\frac{\bar{P}}{\bar{K}}$ may

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[1] It must be noticed that equation (3), and consequently equations (4) and (5), cease to be plausible in the case where taxation is heavy, and its system is such that the tax on profits increases much quicker than profits. (For instance, Excess Profits Tax.) For although profits $P_{t-\theta}$ are net of taxes paid, they include taxes accruing but not yet paid—*i.e.*, the increase in tax reserves; and if this part of profits is considerable it may affect capitalists' consumption decisions. Now, as long as the tax is on a proportionate basis, our formula, it may be shown, still holds good approximately, although λ and θ will have then a more complex meaning. However, if taxation is strongly disproportionate, the formula becomes invalid.

be taken as a first approximation to the average rate of profit p in our period. We thus obtain :

$$p = \frac{1}{1-\lambda}\frac{\bar{A}+\bar{I}}{K_o + \frac{n}{2}\bar{I}} \quad . \quad . \quad . \quad . \quad (7)$$

If we denote $\frac{\bar{A}}{K_o}$ by a, and $\frac{\bar{I}}{K_o}$ by i, we have after simple transformations :

$$p = \frac{2}{n(1-\lambda)}\frac{a+i}{\frac{2}{n}+i} \quad . \quad . \quad . \quad . \quad (7a)$$

Since both A—the average of the stable part of capitalists' consumption—and K_o—the value of capital at the beginning of the period—are fully determined by development prior to this period, $a = \frac{\bar{A}}{K_o}$ may be considered given. Thus the average rate of profit p is represented as a function of i—i.e., of the ratio of average investment $\bar{I}$ to the initial value of capital K_o.[1]

It is tempting to try to express i as a function of the average rate of profit and the rate of interest in the period considered, and in this way determine p as a function of the rate of interest only. But, although the average rate of profit and the rate of interest are doubtless important determinants of the rate of investment, the actual causation of the latter is of much too complex character to be pressed into such a formula. We therefore shall not take this course, but only try to get the best out of the discussion of equation (7a).

III

1. It may be seen directly from the formula (7a) that if $a \gg \frac{2}{n}$ the average rate of profit $p \gg \frac{2}{(1-\lambda)n}$. Since n is about 10 years, it follows at once that the rate of profit is greater than 20 per cent.

In this case the fact that the rate of profit is higher than the rate of interest would be very simply explained. The rate of profit, whatever the rate of investment, is above a certain level. The rate of interest as determined by the demand for cash (dependent chiefly on the volume of transactions) and supply

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[1] It may seem from equation (7) that p falls when the length of the full cycle n increases. But it must not be forgotten that, since A, the stable part of capitalists' consumption, changes within this period, its average $\bar{A}$ depends on its length. Therefore p may not be affected by the change in n.

of it by banks [1] is below this limit. The latter is subject to the qualification that no " over full employment " is then involved; for in such a state the increasing volume of transactions and thus the demand for cash may drive the rate of interest to a very high level. It is unlikely, however, that it should reach the level of the rate of profit because this would imply a very low rate of investment and thus most probably a low level of employment.

We shall now consider the case of $a < \dfrac{2}{n}$.

2. In this case the average rate of profit $p < \dfrac{2}{(1-\lambda)n}$. It is also easy to see that it is an increasing function of i. For if i increases by a certain amount, the numerator of the fraction $\dfrac{a+i}{\dfrac{2}{n}+i}$ increases if $a < \dfrac{2}{n}$ in a higher proportion than the denominator.

It follows directly that to obtain the lower limit of the rate of profit we must substitute into the formula (7a) the lowest level to which i may fall. Now, i is the ratio of the average net investment in our period to the value of capital at its beginning. If investment activity is at a complete standstill (except for necessary repairs) $i = -d$, where d is depreciation in percent. of total capital, say 3 per cent. But actually under the influence of technical progress some innovations are always carried out, and thus $i_{\min.} > -d$, it is, say, -2 per cent. We thus obtain the lowest limit for the rate of profit :

$$p \gg p_{\min.} = \frac{2}{(1-\lambda)n} \frac{a+i_{\min.}}{\dfrac{2}{n}+i_{\min.}} \qquad . \quad . \quad . \quad (8)$$

Let us assume now for the moment that the short-term rate of interest, and in consequence also the long-term rate of interest, is kept by banking policy at a certain definite level r. The condition for the rate of profit, being always higher than the rate of interest, is then :

$$\frac{2}{(1-\lambda)n} \frac{a+i_{\min.}}{\dfrac{2}{n}+i_{\min.}} > r . \qquad . \quad . \quad . \quad (9)$$

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[1] The demand for and supply of cash for transactions determine actually the *short-term* rate. (See, *e.g.*, M. Kalecki, " The Short Term Rate of Interest and the Velocity of Cash Circulation," *Review of Economic Statistics*, May 1941.) However, the long-term rate is determined by expected short-term rates and by certain risk factors. (See, *e.g.*, J. R. Hicks, *Value and Capital*, p. 147; M. Kalecki, " The Long-Term Rate and the Short-Term Rate," *Oxford Economic Papers*, No. 4.)

From this inequality may be obtained the level above which a must be in order that the rate of profit shall always be higher than the rate of interest. If, for instance, $\lambda = 0.30$, $n = 10$, $i_{\min.} = -0.02$ and $r = 0.04$, we obtain from (9) $a > 4.5$ per cent. Thus if a is higher than 4·5 per cent., the average rate of profit is always higher than the long-term rate of interest, which is kept at the level of 4 per cent. Of course even if $a = 4.5$ per cent., but $i > i_{\min.}$, the rate of profit is higher than the rate of interest. However, when $i = i_{\min.}$, the rate of profit falls to the level of the rate of interest. And once it has happened in a certain period, it is by no means certain that the system will automatically " extricate " itself from this tangle.

Indeed, let us assume that in one of our full-cycle periods $p = p_{\min.} = r$. Do developments in this period prepare the ground for a higher rate of profit in the next full-cycle period? Certainly i which $= i_{\min.}$ in the period considered is negative, therefore the capital K_o at the beginning of the next period will be smaller. And this will tend to increase a of the next period, which is the ratio of the average of the stable part of capitalists' consumption $\bar{A}$ to the capital K_o at the beginning of the period. However, dis-saving which takes place in the period considered will certainly tend to depress the stable part of capitalists' consumption in the next period : the less wealthy the capitalists feel the less is the amount they are apt to consume irrespective of their current income. Also the persistence of a very low capitalists' income in the period considered will tend to press down the capitalists' customary standard of living, and this will be reflected in the fall in the stable part of their consumption in the next period.

Thus not only will K_o at the beginning of the next period be smaller, but so also is likely to be $\bar{A}$ in that period. It is thus not at all certain that $a = \dfrac{\bar{A}}{K_o}$ will increase. And if it remains at the same level as in the period considered, nothing has happened to push upwards the rate of profit, which may thus continue to be equal to the rate of interest.

3. So far we have assumed that the rate of interest is given. If, however, investment activity falls—as was assumed in the last section—to its minimum level, total output and employment must shrink considerably; the demand for cash for transactions is greatly reduced, and, as a result, the short-term rate of interest tends to fall, and is followed by the long-term rate. However, the short-term rate cannot fall below zero, and the long-term

rate, because of the risk involved in the fluctuations of the price of bonds (as shown by experience), hardly much below 2·5 per cent. Thus, if a is sufficiently low, the fall of the rate of interest cannot prevent the possibility of the rate of profit reaching the level of the rate of interest. Indeed, there is always such a value of a at which the lower limit of the rate of profit $p_{min.}$ is equal to the lower level of the rate of interest $r_{min.}$.

4. In the light of the above argument, the fact that the average rate of profit over longer periods exceeds the rate of interest is not an economic law, but only a feature of a capitalist economy of a particular structure. If in the course of economic development a falls to a " critical " level which equates the minimum rate of profit $p_{min.}$ to the minimum long-term rate of interest $r_{min.}$, there appears a possibility of the rate of profit being equal to the rate of interest in long periods.[1]

An important characteristic of an economy with a at the " critical " level or not much above it, is that it may be easily subject to " chronic crisis." As long as a is high enough to secure a sufficiently large excess of $p_{min.}$ over $r_{min.}$, investment activity is unlikely to be at a very low level. Indeed, suppose that i *were* in a full-cycle period at its minimum level $i_{min.}$. This would establish a rate of profit $p_{min.}$. But if $p_{min.}$ exceeds sufficiently the long-term rate of interest it is unlikely that investment will be at its minimum level or even close to it.

However, if $p_{min.} = r_{min.}$, or even exceeds it, but not considerably, a very low level of i *is* feasible and with it a severe depression of output and employment in the full cycle period concerned. And, as shown in the preceding paragraph, there is no certainty that the system will automatically come out of such a crisis in the next full-cycle period. An economy of this type may be prosperous over a long period (if i is high); but the threat of " chronic depression " is never lifted.

M. KALECKI

Oxford.

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CURRENT TOPICS

The following has been received from Sir William Beveridge, President of the Royal Economic Society :—

" I know that all Fellows of the Royal Economic Society will wish me to offer to Mr. Keynes their hearty congratulations on his elevation to the Peerage. This is an honour not only to Keynes himself, but also to the science of economics which he so

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[1] $p_{min.}$ may fall also because of a fall in λ.