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contents

Accumulation and Capacity Utilization: Some Critical Considerations on Joan Robinson's Theory of Distribution*

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Introduction

This paper intends to discuss critically the theory of distribution advanced by Joan Robinson, principally in *The Accumulation of Capital*[1] and in her subsequent and connected book *Essays in the Theory of Economic Growth*[2].

The analysis consists of three sections. The first section expounds the basic features of this theory, in which the normal distribution of income is determined on the basis of the rate of accumulation of capital. The second section questions the conception, which appears essential to this explanation of distribution, according to which the flexibility of the degree of utilization of capacity is supposedly limited to the short period only. In the third section we develop the implications of the possibility that also in the long period the utilization of capacity is modified in response to variations in demand.

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[1] London, Macmillan, 1956; henceforward referred to as *Accumulation*.

[2] London, Macmillan, 1962; henceforward referred to as *Essays*. In the preface to this book Robinson writes: "The essays in this volume might be regarded as an introduction rather than as a supplement to my *Accumulation of Capital*" (p. V).

I. JOAN ROBINSON'S THEORY OF DISTRIBUTION

1. Robinson's theory of distribution rests basically on two elements. The first element is constituted by the presumed relation between the rate of accumulation, given by the ratio of net investment to capital stock, and the normal distribution of income. The second element lies in the causal nexus of this relation whereby according to Robinson it is the accumulation rate which determines distribution. This section is first of all devoted to the analysis of these two fundamental elements, and will then go on to consider some other characteristics of this theory.

2. In the *Accumulation of Capital* the inverse relation between the rate of accumulation and distribution descends from the correspondence that is established between the accumulation rate itself and the ratio between the quantities of labour employed to produce, respectively, means of production and consumer goods[3]. A higher ratio between these two quantities implies a lesser production of consumer goods with respect to total employment; for given "propensities to consume" out of wages and profits, the real wage must then be necessarily lower. This can be seen with particular clarity in the extreme hypothesis that the values of the propensities to consume are respectively one for wages and zero for profits: in this case Robinson shows that in the production of consumer goods the ratio of the excess of product over wages to the amount of wages is numerically equal to the ratio between the above-mentioned quantities of labour[4].

In the subsequent *Essays* the relation between the rate of accumulation and income distribution is presented in an even more transparent manner. In this book Robinson can refer to the system of prices described by Sraffa in *Production of Commodities by Means of Commodities*[5], which had been published in the meantime, and to the inverse relation between the real wage and the rate of profit that Sraffa's analysis highlights[6]. The presumed

[3] Cf. J. Robinson, *Accumulation, op. cit.*, pp. 75 and 77.

[4] The value of the (gross) production of consumer goods, defined as $W_2 + Q$ — where W_2 is the amount of wages and Q the "quasi-rent", i.e. the excess of gross product over wages — must in fact turn out to be equal to overall expenditure on consumption. In the hypotheses indicated in the text, this is equal to $W_1 + W_2$, where W_1 is the amount of wages paid in the production of capital goods. It can thus be seen that the ratio W_1/W_2, which (if the wage-rate is uniform) is equal to the ratio between the respective quantities of labour, is also equal to the ratio Q/W_2. This of course implies that the level of consumer-good prices relative to nominal wages is directly linked to the ratio between the two quantities of labour (cf. *ibid.*, p. 75).

[5] P. SRAFFA, *Production of Commodities by Means of Commodities*, Cambridge, Cambridge University Press, 1960.

[6] Cf. J. ROBINSON, *Essays, op. cit.*, pp. 10-11.

link between the rate of accumulation and distribution can thus be stressed, very simply, by showing the positive correspondence between the former and the rate of profit which apparently descends from the necessary equality of net investment and saving per unit of capital[7]. In the hypothesis that savings are drawn exclusively from profits[8], this correspondence is the one generally known as the "Cambridge equation" in the form

$$I/K = s_c P/K$$

where I, P and K represent the values, at normal prices, respectively of net investment, net profits and capital stock, and where s_c indicates the share of (net) profits that is saved[9].

3. We now come to the other basic element which, as we said, characterizes this theory of distribution, and that is the causal nexus whereby distribution itself supposedly depends on the rate of accumulation.

This conception clearly originates in the "Keynesian" idea that investment is determined independently from the capacity of the economy to save, and therefore that saving decisions adjust to an autonomously established volume of investment. Since the relation between the rate of accumulation and distribution derives from the equality of investment and saving per unit of capital — as is particularly evident when this relation is drawn from the "Cambridge equation" — it follows that in the relation in question it is the accumulation rate that constitutes, according to Robinson, the "independent variable":

"Whatever the ratio of net investment to the value of the stock of capital may be, the level of prices (relative to money wages) must be such as to make the distribution of income such that net saving per unit of capital is equal to it" [10].

[7] *Ibid.*, pp. 11-12.

[8] Robinson considers this hypothesis merely as a simplification: cf. *Essays, op. cit.*, p. 12 and p. 40, n. 1.

[9] Although with a lesser emphasis than in the *Essays*, the direct relation between the rate of accumulation and the rate of profit was already present in *Accumulation*: see for instance p. 76.

[10] *Essays, op. cit.*, pp. 15-16. Robinson herself however puts a limit on the determination of the real wage in dependence from the rate of accumulation. This limit is constituted by the wage level that the workers consider as the minimum acceptable, and that they are able to defend by raising their monetary wages in proportion to prices — i.e. opposing what Robinson calls the "inflation barrier" (cf. *Accumulation, op. cit.*, pp. 48-9 and 83-4; *Essays, op. cit.*, pp. 58-9). What, according to this theory, is determined by the rate of accumulation is therefore the distribution between wages and profits of the *surplus* per worker over and above this minimum wage level (cf. in particular *Accumulation, op. cit.*, p. 83). Robinson therefore attributes to the rate of accumulation a role analogous to that which according to Sraffa might be played by the money rate of interest (P. SRAFFA, *op. cit.*, p. 33; for a development of this approach to the determination of distribution, cf. M. PIVETTI, "On the Monetary Explanation of Distribution", in this Journal, Vol. I, n. 2, 1985).

Therefore, describing what is in effect the "Cambridge equation", Robinson concludes:

"Thus, given the propensity to save from each type of income (the thriftiness conditions) the rate of profit is determined by the rate of accumulation of capital" [11].

It is implicit in the conception being described that the accumulation rate be considered as a magnitude known *before* distribution is determined. In its turn, this seems to derive from the "exogenous" nature attributed to the accumulation of capital, at the origin of which there are, according to Robinson, those "animal spirits" already referred to by Keynes, and which in her view reflect "historical, political and psychological characteristics of an economy" [12].

Accumulation would therefore depend on circumstances which cannot be studied within the sphere of economic analysis alone [13], and this exogenous character is apparently extended by Robinson also to the *rate* of accumulation:

"The fact of the matter is that there is no way to close the model that is both neat and plausible. We must be content to leave it open. To account for accumulation, we have to fall back upon human nature and the structure of society. To see why [the rate of accumulation] is greater in some nations or at some dates than at others, we must delve into questions that are below the level at which the model is built" [14].

Even without at this point questioning Robinson's conception as to the determinants of accumulation, it is nonetheless evident that by itself it could not justify the consideration of the rate of accumulation as an independent variable with respect to distribution: the relation between the value of net investment and the value of capital stock will depend in general on relative prices, and hence on distribution itself. To explain how Robinson can think that the accumulation rate might constitute the *datum*

[11] *Ibid.*, p. 10. In *Accumulation* Robinson appears to some extent more cautious than in the *Essays* as to the causal nexus between rate of accumulation and distribution, admitting the possibility of adjustments of the ratio investment/capital stock to autonomous variations in the profit margins per unit of output (cf. *Accumulation, op. cit.*, pp. 77-8). However, generally she refers to the opposite causal order also in this book.

[12] J. ROBINSON, *Essays, op. cit.*, p. 37.

[13] To be able to explain accumulation, Robinson writes, "economic analysis requires to be supplemented by a kind of historical anthropology which is still at its infancy as a scientific study" (*Accumulation, op. cit.*, p. 56).

[14] J. ROBINSON, *Essays, op. cit.*, pp. 15-16.

on the basis of which distribution is determined, we must consider a further aspect of her analysis, that is, the identification of long-period positions with situations of steady growth. We shall go further into this particular conception of Robinson's in the next section; as regards the point now under discussion, it can be considered that if all the quantities increase at a constant and uniform rate, investment (gross and net) and capital stock turn out to be physically homogeneous, and their relation can be expressed independently from prices. Furthermore, precisely because the rate of accumulation represents in this case the proportional increment of physical capital, its dependency on the circumstances governing accumulation appears more immediate.

4. As we said in the preceding section, Robinson's long period analysis presumes conditions of steady growth[15]. More in particular, a constant and uniform growth is one of the characteristics of those states of "tranquillity", free from "internal contradictions or external shocks" and compatible with a continuous fulfilment of expectations[16], to which Robinson refers "in order to separate long-run from short-run influences"[17].

This characterization of long-period positions does not however seem necessary. It reveals a conception in which these positions are contemplated as particular *effective* situations, the realization of which requires conditions that are just as particular. An interpretation of this sort appears different from the one which seems to have been traditionally adopted in economic analysis, according to which long-period positions are significant as "centres of gravitation" of prices and quantities produced[18], and as such they need never necessarily coincide with actual situations. Understood in this light, long-period positions appear perfectly compatible with general conditions of unsteady growth; furthermore, the particular characteristics of "tranquillity" would be in contrast with the role that long-period positions should play outside those artificial conditions — as to some extent can be seen when the analysis of states of "tranquillity" is taken by Robinson as a reference for the study of more general situations[19].

[15] The questions considered in this paragraph are dealt with more extensively in R. CICCONE, "La teoria della distribuzione nell'analisi di Joan Robinson", *Note Economiche*, n. 2, 1984, sections I and IV.

[16] J. ROBINSON, *Accumulation, op. cit.*, pp. 59-60.

[17] *Ibid.*, p. 66.

[18] Cf. in this connection P. GAREGNANI, "On a Change in the Notion of Equilibrium in Recent Work on Value and Distribution. A comment on Samuelson", in M. BROWN, K. SATO and P. ZAREMBKA (eds.), *Essays in Modern Capital Theory*, Amsterdam, North Holland Publishing Company, 1976, pp. 26-9.

[19] Cf. for example the paragraph "Unsteady Growth" in J. ROBINSON, *Essays, op. cit.*, p. 69.

We therefore appear sufficiently justified in choosing to leave aside, for the rest of this paper, the limiting characteristics with which Robinson qualifies long-period positions, and to understand these in their more general significance of "centres of gravitation". Robinson's explanation of distribution will therefore be discussed for quite general conditions, and so independently from the hypothesis of steady growth that underlies her long-period analysis[20].

5. We must lastly highlight an important premise to the explanation of distribution put forward by Joan Robinson.

As has already been remarked, the theory in question is based on the presumed necessity for the normal distribution of income to be such that total saving is equal to total investment:

"The main weight of the equalization of savings to investment (at normal prices) falls upon the distribution of income between classes"[21].

Robinson therefore considers that savings adjust to investment in a radically different way from the traditional Keynesian mechanism, which is based on variations in the level of income. The following passage of the *Essays* seems intended to explain this basic difference:

"When equilibrium prevails, the total size and the distribution of net income are such as to satisfy the condition that net saving per annum is equal to the value of net investment per annum. In the short period, to which the formal argument of the General Theory was confined, the equalisation of saving to investment comes about mainly through varying the level of utilisation of given capital equipment; that is, through varying the level of total income. In long-run competitive equilibrium the relation of total income to the stock of capital is determined within certain limits by technical conditions (...). The distribution of income, however, is strongly influenced by the rate of investment"[22].

So although variations in the degree of utilization of capacity are admitted for the short period, Robinson excludes them as far as the long period is concerned. The rigidity thus attributed to the utilization of equipment, and hence to the level of income produced per unit of capital, seems therefore to have an essential role in the conception that in the long

[20] We shall therefore leave aside the fact that, as has already been observed in the text, outside steady growth the value of the ratio of investment to capital could not be supposed to be known independently from distribution.

[21] J. ROBINSON, *Essays, op. cit.*, p. 12.

[22] *Ibid.*, p. 11.

period it is distribution, rather than the level of income, which adjusts saving to investment[23].

The two following sections are devoted to a criticism of the premise we have just illustrated and to the implications that derive from it; in this way we shall question the very existence of a relation between the rate of accumulation and the normal distribution of income[23].

II. THE UTILIZATION OF CAPACITY IN THE LONG PERIOD

1. This section aims to show how in the long period the utilization of capacity may be modifiable in correspondence to variations in aggregate demand, in contrast to what we have seen to be a crucial premise of the explanation of distribution offered by Robinson.

Before broaching the subject, it is as well to specify that we shall undestand the "long period" as a time-span that is sufficiently long for the gravitation of prices and quantities produced around their respective normal values to manifest itself. We shall therefore refer to long periods of time in a sufficiently common meaning of the term — and hence, to use an expression of Robinson herself, in the sense of "historical" time[24] — just as it may be found in the analyses traditionally founded on that idea of gravitation[25]. In this notion of "long period" there is evidently room for the fluctuations in quantities and prices and the disappointments of expectations that occur in reality, and from this point of view it is quite different from the "tranquillity" assumed by Robinson for her long-period analysis. We have already explained, however, that the special quality of the conditions that Robinson attributes to long-period positions appears unnecessary, and on the contrary in conflict with the use that she herself makes of these positions. It therefore seems to be legitimate to analyse her

[23] The other element on which Robinson's theory of distribution rests, that is, the causal nexus she attributes to the relation between rate of accumulation and distribution, can also be contested, in particular (apart from the question of the general dependence of the investment/capital ratio upon distribution) on the basis of the variations in the capital stock that accompany those of investment over the long run: cf. P. GAREGNANI, *Summary of the Paper "Some Notes for an Analysis of Accumulation"* presented at the Conference *Theories of Accumulation and the Control of the Economy*, Udine, 1982; and F. VIANELLO, "The Pace of Accumulation, in this Journal, vol. I, N. 1, 1985. Vianello's argument is however itself founded on the rigidity of the degree of utilization of capacity in the long period and from this standpoint is therefore in contrast with the critique that will be developed in this paper.

[24] The expression "historical time" is used by Joan Robinson in opposition to that of "logical time", with which she indicates the notion of time implicit in the systems of equations describing positions of "equilibrium" (cf. J. ROBINSON, *Essays, op. cit.*, pp. 23-4).

[25] Cf. for example A. MARSHALL, *Principles of Economics*, Ninth (Variorum) edition, London, Macmillan, 1961 (first edition 1890), Book V, Chap. V, Section 8, pp. 378-9; or K. MARX, *Capital*, Moscow, Progress Publishers, Book III, Chap. X, pp. 190-1.

theory of distribution leaving aside those restrictive conditions and referring instead to long-period positions in their more traditional meaning.

2. The idea that with reference to the long period the degree of utilization of capacity must necessarily be considered as given does not appear well-founded, despite the sureness with which it is asserted by Robinson as by other writers[26].

At the root of this conception there seems to be the very notion of long-period prices. As is generally recognized, these are the prices determined on the basis of conditions of production that can be defined as normal, and hence of a particular degree of utilisation of capacity, which we can also indicate as "normal". Deviations in the actual degree of utilization with respect to the latter are of course admitted, just as with divergences of actual prices from long-period values; but just as these divergences are limited to the short-period — and indeed they characterize the very notion of short period — the same is implicity or explicitly asserted for the divergences of actual from "normal" utilization. In other words, the gravitation of prices around their long-period values is thought to be associated with the gravitation of the actual degree of utilization of capacity around the "normal" degree, so that in the long period there is only room for a single ratio of the level of demand to the stock of existing capacity.

If this reconstruction is valid, the conclusion now stressed does not appear, on close examination, to be sufficiently justified. The tendency towards long-period prices does not in fact seem to require the simultaneous gravitation of the effective utilization of capacity around its "normal" level — i.e. the level of utilization implicit in those prices. As will be seen below, the degree of utilization of capacity that is relevant for long-period prices seems to be that expected for newly installed capacity, which need not necessarily coincide with the degree of utilization actually realized with the existing stock of capacity. Nor on the other hand does the effective utilization of capacity to a "normal" extent appear to be necessary for the uniformity of the rate of profit that (in conditions of free competition) characterizes long-period prices. What the uniformity in question seems to require is that, for given levels of demand, the *relative* sizes of the industries be such that (gross) investment is no more profitable in one industry rather than in another, and not also that the *absolute* size of overall capacity should be in a particular relation to aggregate demand; the presence of generalized excesses or deficiencies of capacity with respect to the size compatible with its normal utilization would not prevent

[26] Like Vianello in the article cited above (cf. in particular p. 76).

transfers of capital from one industry to another from making relative prices tend towards the values corresponding to a uniform rate of profit[27].

What has just been said does not exclude the possibility that a tendency of capacity to assume a particular size relative to demand is constantly at work. There is no evident reason, however, for thinking that an adjustment of this type must take place "simultaneously" with the gravitation of prices towards their long-period values; the tendency to that adjustment seems rather to give rise to a slower and more complex process, which implies net accumulation (positive or negative) for the economy as a whole. In this connection, a significant distinction appears to be that traditionally made in economic analysis between the question of accumulation and that of the tendency of prices towards their normal values, also with regard to the lenght of the time periods concerned[28]. In any case, a general accumulation or decumulation of capital cannot fail to have a wide-reaching influence on aggregate demand itself, and the achievement of a particular size of capacity *relative* to that of demand appears in itself to be a process that is liable to be frustrated for long periods of time. It is then conceivable that these periods may be longer than those required for normal prices to show themselves as the central positions of actual prices — longer that is, then the "long period" itself.

From the aforegoing it follows that the reference to the long period does not necessarily imply the utilization of the existing stock of capacity to the normal extent, i.e. to the extent implicit in long-period prices. Divergences of the actual utilization from that particular level therefore appear conceivable also beyond the short period.

3. The "normal" utilization of capacity has already been indicated as that which enters into the determination of the normal prices of commodities, but which, in accordance with the conclusion reached in the preceding section, is not necessarily to be identified with the actual utilization realized, in the long period, with the existing stock of capacity. It now becomes imperative to specify better this notion of "normal" utilization.

It seems, first of all, possible to state that the costs of production, including profits at the general rate, towards which competition pushes prices are those that may be calculated with reference to gross investment — i.e. with reference to the productive processes into which effective or

[27] In conditions of this type the transfers of capital could of course take place simultaneously with variations in the absolute size of the stock of capacity, thus assuming the form of proportionately different contractions or expansions of the capital invested in the different industries.

[28] Cf. for example the already cited section of Marshall's *Principles* where, with regard to normal prices, he refers to "*long* periods of several years", and then distinguishes the "very gradual or *Secular* movements of normal prices, caused by gradual growth of knowledge, of population and of *capital* (...)" (A. MARSHALL, *op. cit.*, p. 379, last emphasis added).

potential injections of capital would be incorporated in the different industries. When and if the prices of commodities became adjusted to those costs, there would not in fact be any more reason why competition, which operates by investing and disinvesting in the various branches of production, should tend to modify them further. The costs already mentioned therefore appear as the values towards which prices tende, and hence as the values representing long period prices.

It follows from this that the degree of utilization of capacity that contributes to determining the costs in question, and hence the long-period prices of commodities, must be undestood as referring to equipment which constitutes or might constitute gross investment, and not necessarily to that which constitutes the existing stock of capacity[29]. In particular, this degree of utilization appears specific to *newly* installed equipment.

The "normal" utilization of capacity, as the utilization implicit in long-period prices has been defined, seems therefore identifiable in the *expected* utilization of new plant which has been or might be installed. The size of this plant would be of course what entrepreneurs would consider most appropriate in relation to the expected demand for products — which would constitute an expression of the tendency, already discussed, for capacity to adjust to demand — and the character of *normality* attributed to the expected utilization of the capacity in question appears therefore to be justified.

3. We must now consider the circumstances that can determine the *level* of normal utilization of capacity, by influencing the size of plant that appears profitable for given levels of expected demand. At the same time it will be observed that these circumstances seem to guarantee, in the long period, a considerable flexibility in the actual utilization of capacity when responding to levels of demand that are different from those expected.

The first circumstance, of which it is as well to consider the influence on the desired size of capacity, consists in the fluctuations which, in a market economy, generally characterize demand, and hence, more or less closely, production[30].

[29] An analogous distinction can be made with regard to the techniques of production that are relevant for the determination of normal prices. These techniques are not necessarily those incorporated in the existing stock of capital or in a particularly large portion of it, but rather which, as an effect of competition, are currently introduced (to a sufficient extent to influence prices) *via* gross investment. In this connection, see also A. RONCAGLIA, *Sraffa and the Theory of Prices*, New York, Wiley, 1978, Chap. 2, para. 4, pp. 27-9.

[30] Obviously, to the extent to which they give rise to variations in stocks, fluctuations in demand do not determine fluctuations in production. The fact that the latter do however occur seems to show that in general the accumulation and depletion of stocks (which in any case does not constitute a

As is generally recognized, these fluctuations are largely resolved into variations in the utilization of fixed capital. Indeed, what is observed in reality is a utilization of capacity that varies from relatively high levels, corresponding to the peaks reached by production in boom periods, to relatively low levels, corresponding to times of recession.

This simple ascertainment gives us reason to think that the size of capacity installed is commensurate with the relatively higher levels of demand that entrepreneurs expect to encounter, with a certain frequency, during the economic life of their plant. Its volume would therefore be considerably larger than the expected average levels of production, and of course larger still than the troughs of production that can be foreseen. The conclusion thus suggested by observation of the facts seems moreover to find an explanation in the need of the individual firm not to lose market shares when demand goes up — and so, ultimately, in the pressure of competition[31].

On the basis of these first considerations it seems possible to conceive the "normal" utilization of capacity as that which entrepreneurs expect to realize on average, over long periods of time, as a result of the fluctuations in the degree of utilization. Leaving aside for the moment other circumstances that can influence the desidered size of capacity, this average degree of utilization will therefore be the smaller, the larger are the breadth and frequency of the expected falls in production with respect to the peaks for which capacity is adequate[32]. In general it will therefore be considerably lower than the full utilization apparently referred to by Robinson in the passage from her *Essays* quoted above[33]; and it is moreover evident that, even if effective levels of demand do happen to coincide with expected levels, the "normal" utilization of capacity thus understood would not necessarily be realized at any particular moment in time.

cost-free option) cannot eliminate the need for variations in output; on the contrary it is sometimes maintained that the management of stocks has pro-cyclical rather than anti-cyclical effects (cf. V. Zarnowitz, "Recent Work on Business Cycles in Historical Perspective: A Review of Theories and Evidence", *Journal of Economic Literature,* Vol. XXIII, June 1985, p. 527).

[31] Cf. J. STEINDL, *Maturity and Stagnation in American Capitalism;* Oxford, Basil Blackwell, 1952, pp. 8 and 10; R. MARRIS, *The Economics of Capital Utilization,* Cambridge, Cambridge University Press, 1964, p. 95.

[32] The breadth and frequency now mentioned in the text can constitute purely *implicit* connotations of the 'normal' level of utilization if, as appears plausible, this is to a large extent determined on the basis of observation of the past. In this connection, see below, section III, para. 3.

[33] Cfr. above, p. 22. The *normal* under-utilization of productive capacity referred to in the text seems to be precisely what Kalecki consider, in the following passage, as a characteristic proper to a capitalist economy: "A considerable proportion of capital equipment lies idle in the slump. Even on average the degrees of utilisation throughout the business cycle will be substantially below the maximum reached during the boom (...). The reserve of capital equipment and the reserve army of unemployed are typical features of capitalist economy at least throughout a considerable part of the cycle" (M. KALECKI, *Theory of Economic Dynamics*, London, Unwin University Books, 2nd edition revised, 1965 (1st edition 1954, p. 131).

But what counts most, for our pourposes, is that the notion of "normal" utilization thus identified appears compatible with a wide flexibility of the actual utilization of capacity, not limited to short periods of time. To support what we have just said, let us begin by supposing that the relatively higher levels of demand that do effectively occur correspond to expected levels, i.e. to the levels for which the installed capacity is adequate. The average utilization of the equipment may however turn out to be greater or lesser than "normal" utilization according to the effective extent and duration of demand levels which are *below* the peaks. Thus, in figures 1 and 2 the "normal" utilization of capacity is represented as the average utilization corresponding to regular oscillations in the degree of utilization (the dotted curves). The actual utilization may turn out to be higher than the "normal" if, on average, the falls in production with respect to the expected peaks are less deep and/or less frequent compared to those corresponding to "normal" utilization; this is the case exemplified in Fig. 1. An average utilization below the "normal" level would occur in the opposite case, i.e. if the drops in production with respect to the expected peaks turned out to be deeper and/or more frequent than those implicit in "normal" utilization, as exemplified in Fig. 2.

Average levels of demand which, relative to productive capacity, turn out to be higher or lower than those expected can in this way give rise to average degrees of utilization that are respectively greater or lesser than "normal". It follows from this that even considering long periods of time the adjustment of the (average) ratio savings/capital to the (average) ratio investment/capital can take place through differences in the (average) level of income produced per unit of capital — corresponding to differences in the (average) utilization of capacity[34]. The presumed necessity that differences in the value of the accumulation rate should imply, in the long period, an adjustment of savings per unit of capital obtained *via* the distribution of income thus seems to receive a first disavowal.

4. The conclusions now reached have been obtained by assuming that the highest levels of aggregate demand correspond, in any case, to those for which the installed capacity is adequate. This hypothesis has served to show how, over long periods, the actual utilization of capacity can turn out to be different from "normal" utilization without the size of the capacity being seen as "wrong" with respect to what entrepreneurs would have found profitable to install. In other words, this hypothesis has enabled us to verify the existence of margins within which deviations, not

[34] It is interesting to note that an analogous argument to that now developed in the text is used by R.C.O. Matthews to contest the uniqueness of Harrod's "warranted rate of growth": see R. C. O. MATTHEWS, *Trade Cycle*, Digswell Place, James Nisbet & Co. Ltd., and Cambridge, Cambridge University Press, 1959, pp. 238-9.

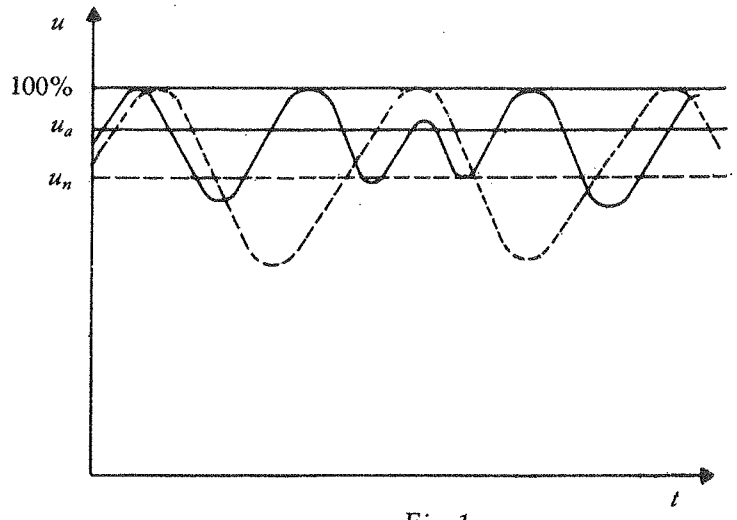

Fig. 1

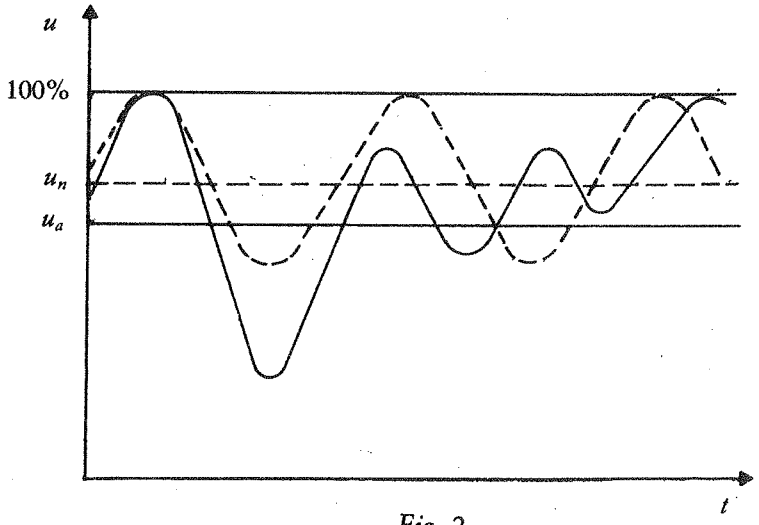

Fig. 2

t = time.
u = average degree of capacity utilization.
u_n = "normal" utilization.
u_a = actual utilization.

limited to the short period, in the utilization of capacity with respect to "normal" utilization do not resolve into undesired excesses or deficiencies of capacity.

The possibility that over long periods the actual utilization of capacity should turn out to be different from "normal" does not however seems to be invoided if the hypothesis in question is put aside. This appears immediately evident for the case in which the effective levels of demand do not reach the expected peaks, or reach them less frequently than would be

necessary to make the existing volume of capacity profitable. In this case we would have an actual excess of capacity over the size that it would have been profitable to install; and, for reasons that in part have already been mentioned, this excess would not necessarily be eliminated quickly enough. The durability and indivisibility of fixed capital constitute a first, evident obstacle to its reduction; but above all the negative effects, on the level of aggregate demand itself, of the disinvestments or lower levels of investment tending to that effect, leave us to presume that the attempt to reduce the size of capacity *relative* to demand may turn to be unfruitful even over long periods of time.

Falls in the average utilization of capacity with respect to "normal" utilization therefore appear possible, over long periods, even to the extent that they imply the persistence of undesired excess capacity.

A symmetrical possibility would appear not to exist, at first sight, for levels of demand that *exceed* the expected peaks and hence, in accordance with our present assumptions, the size of existing capacity.

In order to give better consideration to this case, it is opportune to distinguish the demand for investment from the aggregate demand that the former generates *via* the multiplier. It can thus be seen that an excess demand for capital goods with respect to the capacity of the relative industries, which is the most immediately relevant problem for our concerns, does not necessarily extend to the whole of aggregate demand. The multiplier in fact can only feed global demand to the extent that demand for capital goods is translated into an effective production of income in the industries directly concerned, and therefore not beyond the threshold of the full utilization of the capacity of the latter[35]. Investment demand therefore seems to be able to cause an *excess* of aggregate demand only in the case where in the rest of the economy the full utilization of capacity is generally reached *before* it is reached in capital-goods industries; in other words, if we are faced with disproportions in the size of consumer-good industries with respect to the capacity of capital-good industries.

The possibility that disproportions of this type may occur, especially in correspondence with "high" levels of investment, certainly cannot be ruled out, nor, for reasons that are by now well-known, it is certain that they represent a phenomenon limited to short periods[36]; but on the other

[35] Precisely in the fact that the multiplier cannot operate beyond the full utilization of capacity in capital-goods industries a mechanism is identified which can arrest the expansionary phases of the economic cycle — i.e. determine the *ceiling* reached during booms: cf. for example, R. C. O. MATTHEWS, *op. cit.*, pp. 155-6. Robinson herself seems to hold an opinion of this kind (cf. *Accumulation, op. cit.*, pp. 200-1).

[36] This in fact would be a case of deficiencies of capacity extented to a considerable number of industries, the investment of which would presumably have large effects on aggregate demand itself.

hand it is evident that they cannot constitute the starting point for reaching sufficiently general conclusions. It therefore appears legitimate here to abstract from the possibility of these disproportions — assuming, for example, that the sizes of the different industries are such that the full utilization of their respective capacities is reached simultaneously[37].

Since it is thus limited to the demand for capital goods alone, an excess with respect to productive capacity appears capable of being "redistributed", as it were, over a longer time-span by the formation of backlogs of orders — which would obviously be less plausible for most of consumer demand. The limit constituted by existing capacity in capital-goods industries could therefore modify the *form* otherwise taken by the fluctuations in the demand for these goods, in fact by "squashing" their excesses on levels that would be lower but more extended over time.

By means of this mechanism the excesses of demand for capital goods with respect to the capacity of the relative industries would resolve themselves into the maintenance over periods longer than those expected of a full or at any rate high utilization of this capacity, and, by the working of the multiplier, of overall capacity; other conditions being equal, this would contribute to raising the average effective utilization of capacity with respect to "normal" utilization. In contrast to what appearances seemd to suggest, deviations from the "normal" utilization of capacity could therefore exhaust even possible deficiencies of existing capacity with respect to the peaks reached by demand.

5. The possibility that higher peaks of demand than those expected may produce a higher average utilization of capacity than "normal" would naturally be even stronger if the size of capacity were greater than the peaks of demand foreseen by entrepreneurs. And in effect it is not hard to identify reasons to justify the profitability of such excess margins of capacity.

The expectation of a growth in demand, together with the economic indivisibility that may characterize fixed capital, already constitutes an evident reason why it may be profitable to install a capacity greater than the peaks expected for the most immediate future[38].

The choice of excess volumes of capacity in regard to the highest

[37] This is equivalent to supposing that the composition of the capital stock is adjusted to the composition that aggregate demand assumes in correspondence with the full utilization of capacity in capital-goods industries.

[38] Cf. STEINDL, *op. cit.*, pp. 9-11. In the argument with which he justified the existence of "desired" excess capacity Steindl does not seem to take into account, at the same time, the entrepreneurs' expectations of fluctuations in demand; thus, he defines the excess capacity in question with reference to a generic level of demand and not, more specifically, to the peaks expected in demand itself. Despite this, Steindl appears to be aware of the relevance of these fluctuations for the determination of the desired size of capacity: see above, n. 31.

expected levels of demand may furthermore follow from the relation existing, for given levels of output, between the size of the plant and the production costs obtainable. Thus, if equipment of greater capacity permitted the adoption of more economical methods of production, their employment could turn out to be profitable even for production levels that stayed permanently below their potential. Or, again, an excess capacity could be profitable if the unit costs of production increased as the degree of utilization of the plant increases beyond certain limits: this could occur, for example, as an effect of the higher hourly wage rates that generally have to be paid for work done outside normal working hours[39].

The "normal" utilization of capacity can therefore imply not only the expectation of a certain breadth and frequency of the fluctuations in demand, but also the expectation of the idleness of the excess capacity deliberately chosen by the entrepreneurs; on the other hand, these margins of (intended) excess capacity seem to increase the elasticity that the actual utilization of capacity can show in response to higher demand levels than expected.

III. RATE OF ACCUMULATION, NORMAL DISTRIBUTION AND PROFITS PER UNIT OF CAPITAL

1. As has already been mentioned in the previous section, the flexibility shown by the actual utilization of capacity even over long periods of time seems to rule out the necessity for any influence of the rate of accumulation on the normal distribution of income. If, as in general it appears reasonable to suppose, total saving varies in a direct relation to the level of total income, different (average) values of the ratio investment/capital stock can generate adequate savings per unit of capital *via* a greater or lesser average utilization of capacity, and hence through differences in the average level of income produced per unit of capital. In other words, given the rate of saving per unit of capital corresponding to *normal* distribution of income and utilization of capacity, average investment and savings per unit of capital that are greater or lesser than this value may be realized through average degrees of capacity utilization that turn out to be, respectively, higher or lower than "normal" utilization. The analysis carried out in the previous section has shown in what way this could actually occur.

Thus, in contrast to what is maintained by Joan Robinson's theory, normal distribution does not seem to be necessarily involved in the adjustment of savings per unit of capital to a given long-period value of the rate

[39] Cf. R. MARRIS, *op. cit.*, Chap. I.

of accumulation. This result can be seen as immeditaly evident if, as in the *Accumulation of Capital*, the influence of the rate of accumulation on distribution is represented with the presumed inverse relation between the former and the real wage. Thanks to the flexibility of the actual utilization of capacity, the differences in the (average) ratio of demand for to productive capacity of consumer goods, generated by different (average) levels of investment per unit of capital, can be satisfied by correspondingly different (average) levels of production of those goods. In consequence, differences in the (average) rate of accumulation do not imply necessary differences in the ratio of the production of consumer goods to the total quantity of labour employed in the economy, and so do not require changes in the real wage[40].

2. The implications deriving, for the theory under discussion, from the analysis conducted so far may be less transparent when we look at the presumed direct relation between the rate of accumulation and the (normal) profit rate. In effect, the necessary validity — in the hypothesis that only profits are saved — of the relation between investment and profits per unit of capital makes the question to some extent more problematical; as can be guessed, the conclusions we shall reach will however be symmetrical with those obtained for the relation between rate of accumulation and (normal) wage rate.

A first, crucial result seems in any case to follow immediately from the above analysis. Owing to the flexibility which, as has been argued, characterizes, also in the long period, the actual utilization of capacity, and hence the level of income produced per unit of capital, the necessary direct relation between investment and profits per unit of capital seems capable of being satisfied independently from changes in the real wage. Assuming that this be given at its "natural" level, the average value of the profits obtained relative to capital could, in other words, take on different values in correspondence with different values of the average accumulation rate, as an effect of a greater or lesser level of output realized per unit of capital[41]; the level of the normal wage rate, therefore, could not be

[40] Differently from what is presupposed by the inverse relation between rate of accumulation and real wage, a greater (lesser) quantity of labour employed in the sector producing capital goods does not therefore imply the necessity of a higher (lower) relation ratio of this quantity of labour to that employed in the aggregate production of consumer goods. The same conclusion is also reached by Vianello in the article already mentioned (cf., in particular, p. 82); differently from here, Vianello holds, however, that the proportional variation (other conditions being equal) in the quantities of labour should be exclusively attributed, in the long period, to proportional variations in the stocks of physical capital in the two sectors, and that variations in the degree of utilization of equipment play no role.

[41] If a degree of utilization of capacity higher than 'normal' implies, on average, higher unit costs — for example as an effect of higher wage rates due to overtime work — it could happen that the

traced back unequivocally to the value of the rate of accumulation[42].

In short, the profits realized per unit of capital depend not only on the level of the real wage and on technical conditions, but also on the actual utilization of capacity. This seems to open up a further question, in particular since the profits we are referring to are those realized, on average, over *long* periods of time: the question is whether these profits can be identified with the *normal* rate of profit, that is with the rate generally taken into consideration in distribution theories. The answer to this question evidently has a certain interest in itself, and is in any case relevant to establish if from the direct relation between rate of accumulation and profits per unit of capital there may follow at least a determination of the normal rate of profit, if not of the normal real-wage rate.

To pose the problem we have just stated is equivalent to asking oneself if, given the wage at its "natural" level, the value of the normal rate of profit depends on the utilization of capacity that has effectively been made over the long period; or, in more general terms, which is the utilization of capacity that together with the technical conditions establishes the relation between the (normal) values of the two distributive variables.

lower (net) profit per product unit were not compensated by the greater average level of output, and that, for the same (basic) real-wage rate the average ratio profits/capital actually realized might not increase, and might even decrease, with respect to that corresponding to the 'normal' utilization of capacity. In this case the realization of higher average profits per unit of capital could not be ensured simply by a higher utilization of capacity, and would require the real wage to be somewhat lower.

The existence of an inverse relation between the rate of accumulation and the *normal* level of the real wage could not however be revived on this ground. First of all, the need for a fall in the real wage cannot be explained, in the case under consideration, by the need to adjust saving to investment per unit of capital: it is sufficient to abandon the assumption that savings are drawn only from profits to obtain the result that their ratio to the stock of capital may increase as income per unit of capital increases — even if the ratio of profits to capital is not increasing. That fall in the real wage should rather be justified by the consideration that for a higher degree of capacity utilization to be realized, entrepreneurs must have an interest in it, and this reasonably means obtaining higher profits per unit of capital. But as has already been said, a fall in the real wage becomes necessary, in this connection, only if unit costs increase as capacity utilization turns out to be higher than normal and, moreover, they increase so much that the lower profits per unit of capital are not compensated by the higher levels of output. In our view, none of these conditions necessarily occurs as capacity utilization is higher than 'normal' (for a different opinion, see, on this issue, H. KURZ, "'Normal' Positions and Capital Utilization", sections 4 and 5): the size, as well as the algebraic sign, of the differences is unit costs would be different according to several circumstances, amongsts which the "shape" of the fluctuations which would bring about the higher-than-normal utilization of capacity.

Thus, the influence that in this way the rate of accumulation may exert on the real wage does not seem to be sufficiently general for the determination of the normal wage rate to be based on it — as is confirmed by the absence of a symmetrical need for changes in the real wage in the case of falls in the utilization of capacity with respect to the 'normal' degree. That influence, we believe, should rather be put at the origin of possible *deviations* of the real wage from its normal value, and this conclusion seems to be reinforced by the consideration that what that influence would express is not the need for a particular *level* of the real wage, but only the need for particular *variations* in the latter: the level to which that influence might bring the real wage would therefore be undetermined, since it would be different according to the starting level of the wage itself.

[42] Of course, the impossibility of determining the normal real-wage rate also prevents us from determining the corresponding relative shares of wages and profits.

It seems that a solution to this question must be found in what we said in the preceding section about the utilization of capacity implicit in the long-period prices of products: indeed, the degree of utilization that for a given wage rate and for given productive methods determines the normal rate of profit can only be the same as that which determines, simultaneously, the normal values of commodities. It was then argued that this utilization of capacity, in its turn defined as "normal", appears as that expected for the *newly* installed equipment, from which, as was maintained in the same section, the actual utilization of the stock of capacity can differ even for long periods of time.

For a given real wage rate and for given technical conditions, the normal rate of profit therefore appears to be determined in correspondence with the 'normal' degree of utilization of capacity. From the possibility that in the long period the actual utilization of capacity turns out to be different from 'normal' utilization, it therefore seems to follow that it is necessary to keep the profits realized per unit of capital distinct from the normal rate of profit[43] — which is shown, according to what we have said above, in the expected yield on investment, rather than in that on the existing stock of capital[44].

3. The further question which must lastly be considered concerns the legitimacy of the distinction between the actual utilization of capacity obtained over long periods, and the 'normal' utilization — a distinction underlying the other distinction, now delineated, between profits realized per unit of capital and normal rate of profit. Against the first distinction it could be maintained that normal utilization, i.e. the utilization expected for the newly installed plant, derives plausibly from the observation of the utilization of capacity that has actually taken place, on average, over long periods of time. A clear distinction between the two notions of utilization would therefore be meaningful in the short period, but could be held to be much less so in the long period, in which 'normal' utilization would adjust, as it were, to the utilization of capacity effectively realized.

A first, immediate answer to this possible objection is that to the extent that effective long-period utilization of capacity implies undesired excesses or deficiencies of capacity, it cannot influence the utilization expected for the newly installed equipment — the size of which will be, as is obvious, what appears most suited for expected levels of demand.

[43] A similar distinction is, in contrast, absent in for example Steindl's analysis, where the rate of profit is solely identified with the profits realized relative to the capital stock, and hence depends on the actual degree of utilization of capacity (cf. J. STEINDL, *op. cit.*, p. 122; cf. also his recent paper "Distribution and Growth", in this Journal, vol. I, No. 1, 1985, in particular pp. 53-5).

[44] This appears to be in agreement with Pivetti's observations in the paper already mentioned (cf. M. PIVETTI, *op. cit.*, pp. 81-2). See also Wicksell's analogous opinion, quoted by Pivetti in the note on p. 81.

It has however been stressed in the previous section that the average utilization of capacity can be considerably different according to the effective breadth and frequency of fluctuations in demand, and so, to that extent, independently from undesired excesses or deficiencies of capacity. It is therefore more reasonable to refer to these margins of flexibility in the actual utilization of capacity in the discussion of the influence that this may have on what is considered normal utilization.

Within the limits now indicated it does not seem possible to deny the existence of a relation between 'normal' and actual utilization of capacity. Since the future fluctuations of demand (relative to capacity) cannot in general be known in advance, it is plausible that the average expected utilization for equipment of the desired size is to a large extent estimated on the basis of the utilization of capacity experienced in the past. However, precisely the variability of fluctuations in demand, which on the one hand prevents forecasts of their breadth and frequency, on the other leads us to suppose that the determination of 'normal' utilization of capacity refers to the average utilization observed over very long periods of time — long enough, for example, to include several economic cycles[45]. It consequently seems possible to maintain that the effectively experienced utilization of capacity influences the utilization considered normal only very slowly, and the distinction between the two notions therefore appears justified when the temporal dimension of the analysis is the one usually referred to as "long period"[46].

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[45] Confirmation of the actual presence of this sort of criterion in the cost-accounting practices used by firms can be found in J. A. CLIFTON, "Administered Prices in the Context of Capitalist Development", *Contributions to Political Economy*, No. 2, 1983. In particular, on p. 26 we read: "Base prices were calculated from historical data covering *as many business cycles* and different market conditions as experience allowed. From such data the *normal* characteristics of the market were calculated. Standard volume was an average production rate which was used at the basis for estimating standard costs" (italics added). And again, on p. 32: "(...) standard volume was derived from the history of market conditions on average. From this, total factory costs were determined (...)".

[46] It is interesting to note that the 'normal' utilization of capacity, as it has been understood in this paper, seems to have been contemplated by Keynes in some statements he made about circumstances which in his *General Theory* he defines as "long-term expectations". Amongst these circumstances, which for Keynes constitute "the factors which determine the prospective yeld of an asset", he lists in fact "the strength of effective demand from time to time during the life of the investment under consideration" (J. M. KEYNES, *The General Theory of Employment, Interest and Money*, London, Macmillan, 1936, p. 147) — and this seems to correspond exactly to the expected average utilization of newly installed equipment, with which we have identified the notion of 'normal' utilization of capacity. And the necessity, discussed above in the text, of keeping normal utilization of capacity distinct from actual utilization seems to fit well with Keynes's consideration that "it is of the nature of long-term expectations that they cannot be checked at short intervals in the light of realized results" (*ibid.*, p. 51).