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Accumulation, Capacity Utilization and Distribution: a Reply

Roberto Ciccone

In two separate and independent contributions to this Journal, Kurz and Amadeo have criticized some arguments of an earlier work of mine (also published in this Journal) and expressed views that anyway conflict, in various respects, with those I have put forward.¹ The present paper is intended to meet the explicit criticisms of the two authors, as well as discuss some further points about which a divergence of opinions apparently exists.

PART ONE: COMMENTS ON KURZ

1. The main point of disagreement between Kurz's analysis and mine apparently concerns the notion of normal utilization of capacity. Although both Kurz and myself regard normal utilization as that implicit in the normal prices of commodities, our views are substantially different as to the circumstances that enter into its determination.

In order to discuss this issue, it is convenient to start by briefly explaining again my specification of normal utilization. In my former paper this concept was singled out as the *average* rate of utilization that entrepreneurs expect for newly installed equipment, as a result of fluctuations in demand, and therefore in output, relative to capacity.² Strictly in connection with this notion of normal utilization, the desired dimension of capacity was conceived of as adjusted to the *peaks* of demand that entrepreneurs expect to profitably meet with it.

¹ Cf. H. D. KURZ, "Normal Position and Capital Utilization", this Journal, vol. 2, n. 1, 1986; E. J. AMADEO, "The Role of Capacity Utilization in Long-Period Position", *ibid.*, vol. 2, n. 2, 1986; R. CICCONE, "Accumulation and Capacity Utilization: Some Critical Considerations on Joan Robinson's Theory of Distribution", *ibid.*, vol. 2, n. 1, 1986.

² R. CICCONE, *op. cit.*, pp. 26-7.

Contrary to the conception just outlined, Kurz maintains that demand and output fluctuations must not be taken into account in the determination of the normal rate of capacity utilization, and therefore of normal prices. In his view, the consideration of fluctuations would substantially alter the nature of normal prices, and more generally of normal positions, which could no longer represent "gravitation centres" — as was on the contrary the case for the Classical economists and Marx.

Precisely with reference to Marx for an allegedly similar opinion, Kurz explains this presumed incompatibility with the lack of regularity of cyclical fluctuations, as well as with the fact that they may be affected by temporary and accidental factors. In short, Kurz's view seems to be that the characteristics of fluctuations are in contrast with the stability that must be proper to positions supposed to act as gravitation centres of prices and quantities.³

However, this argument does not seem to distinguish between *actual* and *normal* utilization of capacity. The instability which Kurz apparently refers to is certainly a possible feature of the actual utilization that can be reckoned, to use his own words, "[a]veraging out any pair of successive booms and slumps".⁴ But the same instability need not characterize the normal rate of utilization — even if this is conceived of as an average of expected fluctuations in utilization. As suggested in my earlier paper, precisely the irregularity of fluctuations makes it reasonable to suppose that the rate of utilization regarded as normal is determined on the basis of the average rate of utilization observed over quite long periods of time, such as to include several economic cycles.⁵ The normal rate of utilization will hardly be affected, therefore, by recent fluctuations, and even less by those currently experienced.

It thus appears that the concept of normal utilization can take into account the occurrence of fluctuations in output, without losing the character of relative persistency that is required by the Classical-Marxian notion of normal prices and positions. It should be noted, in this regard, that differently from the view Kurz ascribes to him, Marx himself seems to contemplate the existence, and therefore the expectation, of output and/or price fluctuations when considering the tendency to normal prices and positions. An example of this attitude concerns the tendency to prices of production, characterized (under free competition) by a uniform rate of profit.

³ H. D. KURZ, *op. cit.*, p. 41.

⁴ *Ibid.*

⁵ Cf. R. CICCONE, *op. cit.*, p. 36. It must be recalled that in my analysis the influence of the average rate of utilization experienced in the past on that regarded as normal only concerns the breadth and frequency of fluctuations. On the contrary, it does not include the effect that "mistakes" in the dimension of the equipment installed — i.e. undesired excesses or shortages of capacity — might have produced on the observed rate of utilization. By definition, the normal rate of utilization cannot be affected by such "mistakes".

While arguing that differences in the profit rates will eventually induce transfers of capital from one industry to another (which will tend to eliminate those very differences), Marx warns the reader against considering those transfers as too much immediate a reaction of capital owners, because:

“The fluctuations of profit caused by the cycle of *fat* and *lean* years succeeding one another in any given branch of industry within given periods must ... receive due consideration”.⁶

And a few lines below he says, even more explicitly:

“Experience shows, moreover, that if a branch of industry ... yields unusually high profits at one period, it makes very little profit, or even suffers losses, at another, so that in a certain cycle of years the average profit is much the same as in other branches. And capital soon learns to take this experience into account”.⁷

2. The consideration of fluctuations in the specification of normal capacity utilization not only appears compatible with, but even necessary to, the notion of normal prices as gravitation centres. This can be shown by referring, by contrast, to the concept of normal utilization adopted by Kurz.

For the reasons already discussed, the definition of normal utilization put forward by Kurz abstracts from any change in the level of output relative to capacity, except for only those fluctuations that are seasonal, or at any rate follow a regular pattern. If this lesser kind of fluctuations is left aside, as Kurz himself does in his formal determination of the normal rate of utilization,⁸ that conception amounts to an assumption of the con-

⁶ K. MARX, *Capital*, vol. III, Moscow, Progress Publishers, 1966, p. 208.

⁷ *Ibid.*. In my opinion, even the passage quoted by Kurz at p. 41 of his paper does not sufficiently support the view that Marx keeps fluctuations out of his specification of normal positions. True, in that passage Marx abstracts from fluctuations and refers exclusively to normal conditions. This is a perfectly legitimate way of tackling problems for which the consideration of fluctuations is not regarded as essential — which does not imply, however, that normal conditions, and particularly the normal utilization of capital, are specified *independently* of fluctuations. The determination of normal prices is an example of what has just been said: the fact that this determination only involves the normal utilization of capacity (as Kurz agrees), does not mean that the occurrence of fluctuations cannot be *implicit* in the very notion of normal utilization. Moreover, the part of the passage by Marx that Kurz fails to quote seems to provide some foundation for the possibility that in Marx's mind the normal utilization of capital does take account of fluctuations. That part of the passage reads:

“In businesses which have, from the outset, to reckon with such fluctuations, the situation is relieved partly by recourse to the above measures [the extension and intensification of working time] and partly by employing *simultaneously* a greater number of labourers, in combination with the application of *reserve fixed capital*, such as reserve locomotives on railways, etc.” (K. Marx, *op. cit.*, vol. II, p. 262, emphases added).

It can be seen that the concept of a *reserve fixed capital* to be used by increasing the quantity of labour employed *simultaneously* (i.e. within *each* shift), as a measure to face increases in output above the normal level, implies an obvious influence of fluctuations on the size of fixed capital itself, and hence on what is to be regarded as its normal utilization. Actually, in the passage just quoted Marx seems to come quite close to the notion of normal utilization put forward in my analysis.

⁸ H. D. KURZ, *op. cit.*, pp. 48-51.

stancy over time of the output: capacity ratio. The normal, or desired, value of that ratio is thus determined by referring to a given, single level of output, and by arriving at the most profitable volume of capacity which corresponds to that output level.⁹

The problem with this specification of normal utilization is that the occurrence of fluctuations in the output:capacity ratio entails unit costs of production generally different from those obtained (any other condition being the same) assuming the constancy of that ratio. Indeed, once the occurrence of fluctuations is admitted, this heavily affects the most profitable dimension of capacity, which therefore can no longer be determined with reference to a single level of output¹⁰ — even if the latter is made to coincide with the average output level.¹¹ The normal (average) ratio of output to capacity will therefore be different, and so will the unit costs of output, by force of the obvious relation that connects them to that ratio.¹²

The question of whether fluctuations must have a part in the specification of the normal utilization of capacity, amounts therefore to that of establishing whether firms will generally take them into account in the determination of expected costs. The connection, that the whole problem has with the notion of normal prices as gravitation centres thus appears evident: since the concrete calculations by firms of expected costs and returns are what guides their decisions, actual prices can only tend towards values which reflect those calculations.

Now, there appears to be no reason why the experienced occurrence of fluctuations in the utilization of capacity should not be taken into account by firms in the determination of expected costs. The obvious fact that future fluctuations are uncertain could not justify their exclusion from consideration, as can be easily concluded by observing that to a greater or lesser extent, the same uncertainty applies to *all* the factors that affect expected costs and returns — while the only certainty firms would get by abstracting from fluctuations is that their actual costs would *not* equal those calculated in that way. It thus appears reasonable that the estimate of fu-

⁹ *Ibid.*; see also pp. 43-4. In particular, the choice of the most profitable volume of capacity (for a given level of output) concerns, in Kurz's analysis, the alternative between the operation of plant under a single-shift system or under a multiple-shift system.

¹⁰ Thus R. Marris, in his classic book *The Economics of Capital Utilisation* (Cambridge, Cambridge University Press, 1964), refers for most of his theoretical analysis to a single level of demand, but once he admits fluctuations in the latter he observes that in determining the profitable size of plant, and therefore of capacity, "the decision will be found to depend on the statistical characteristics or 'shape' of the probability distribution of demand" (p. 95).

¹¹ The same average level of output may be the result of a larger or smaller breadth of fluctuations in production, and therefore be associated with different amounts of profitable capacity.

¹² An obvious example of the influence of the output: capacity ratio on unit costs is the incidence per unit of output of the costs relating to fixed capital.

ture costs must take account of the influence of fluctuations, which are therefore bound to enter into the concept of normal capacity utilization.

3. A further and explicit criticism by Kurz concerns my argument about the possibility that the ratio of profits to capital actually obtained exceeds the normal profit rate, simply as a result of a higher than normal utilization of capacity. In my analysis this possibility is strictly connected to the presence of fluctuations in the concept of normal utilization of capacity, which in turn entails an adjustment in the dimension of capacity to the *peaks* of demand entrepreneurs expect profitably to meet. Then, I argued, if average aggregate demand remains higher, relative to capacity, than it was expected, the average utilization of capacity will exceed that regarded as normal, and the ratio of profits to capital will correspondingly exceed the normal profit rate. I was thus able to maintain that the direct relation between investment and profits per unit of capital imposed by the "Cambridge equation" can generally be satisfied, in the face of an increase in the rate of accumulation, without requiring a fall in the real wage.¹³

Kurz's criticism of this view consists in denying that a rise in actual above normal capacity utilization can be obtained, for the economy as a whole, in the way suggested in my paper. He observes that in some industries firms may plan to meet demand fluctuations by opposite variations in inventories. In the industries where this was the case, there would be no additional capacity installed for this purpose, and then available for more frequent utilization. This limit to a rise in the average rate of capacity utilization would in fact extend to the whole system, if some of those industries are "basic".¹⁴

Kurz's conclusion is that what allows for a generalized increase of actual above normal utilization of capacity is rather a switch to more costly regimes of plant operation — typically, an increase in the number of shifts compared to those operated at normal utilization. But at unvaried prices and wage-rates, such a higher rate of utilization would necessarily turn out to be less profitable than normal utilization, and would consequently yield an amount of profits per unit of capital lower than the normal rate of profit.¹⁵ A higher than normal rate of utilization could therefore only allow for the realization of a higher than normal profit rate in combination with a rise in prices relative to wage-rates — i. e. with a fall in the (basic) real wage-rate.

Despite Kurz's view to the contrary, however, my argument does not seem to be weakened by the possibility that in some industries firms plan

¹³ See R. CICCONE, *op. cit.*, p. 32.

¹⁴ H. D. KURZ, *op. cit.*, p. 53.

¹⁵ *Ibid.*

to meet demand fluctuations exclusively by variations in inventories — which implies that they adjust capacity to the *average* level of expected demand, rather than to its peaks, and keep utilization unaltered over time. In order to behave in that way, those firms should feel able to foresee the fluctuations in the demand for their products quite precisely: otherwise, they would risk finding themselves unable to meet all the demand they would have wished to, or, conversely, persistently to face an undesired growth in inventories. But such a perfect predictability could only be assumed in industries where demand fluctuations have been, and are therefore expected to be, highly regular, if not actually absent.

Clearly, a high degree of regularity is not a general characteristic of demand fluctuations, as Kurz himself remarks earlier in his paper.¹⁶ A first conclusion that can be reached is therefore that his argument only applies, if at all, to relatively few industries, while in most sectors changes in capacity utilization and therefore a suitable dimension of the latter, will take on a substantial role in matching demand fluctuations.

A second, and even more decisive conclusion is that precisely in the face of the irregularity that generally characterizes demand fluctuations, the regularity (if not the absence) of demand fluctuations in the industries referred to in Kurz's argument implies that the demand for the products of those industries is highly "inelastic" with respect to changes in the level of aggregate demand and output. This appears to be in conflict with the possibility that those products constitute "basic" commodities, as is on the contrary entailed by Kurz's objection. It in any case undermines the very premise of that objection. Indeed, precisely because of that inelasticity, the ratio of demand to capacity would not rise, in the industries concerned, as aggregate demand increases relative to total capacity. No difficulty would then arise for my argument from the dimension of capacity in those industries.

It must be acknowledged, however, that even within my own argument there is room for conditions in which a higher than normal average utilization would not be sufficient for the realized profit rate to exceed the normal rate.

This might happen if some element of the unit cost of output increases (at given prices and wage-rates) as capacity utilization rises above certain levels — as would be the case of the unit labour cost for firms which planned to meet the higher levels of demand by increasing the number of shifts by which plant is operated, rather than by installing a larger plant. With prices and wage-rates unvaried, a higher than normal frequency of high rates of utilization could then raise the average total unit cost of out-

¹⁶ As has been considered above in the text, it is precisely the irregularity of fluctuations that motivates, in Kurz's view, the need to abstract from them in the specification of the normal utilization of capacity.

put, and thus reduce the average profit margin. The ratio of profits to capital could then turn out lower than at the average normal utilization.

However, for the latter result to obtain and affect the global profit:capital ratio of the economy, the following requirements have to be met. First, in the industries where the rise in unit costs takes place, the fall in average profits per unit of output must be sufficiently large to offset the increase in the average level of output;¹⁷ second, those industries must constitute a sufficiently large portion of the system. Unless *both* those conditions are satisfied, the profit:capital ratio in the economy as a whole will turn out higher at a higher than normal average utilization of capacity, and therefore it seems possible to refer to this result as the more general case.

PART TWO: COMMENTS ON AMADEO

1. According to Amadeo, my analysis does not sufficiently support the conclusion that distribution need not be involved in the adjustment of the saving: capital ratio to the rate of accumulation. This criticism relies, in the first place, on the alleged *exogeneity* that in my paper characterizes, in Amadeo's view, the actual utilization of capacity.¹⁸ Such a presumed exogeneity is obviously considered to conflict with the role I ascribe to capacity utilization — which is precisely that of allowing for the adjustment mentioned above. In effect, had I really conceived of actual capacity utilization as exogenous, and therefore somewhat arbitrarily determined, there would have been no consistency in the argument that changes in the rate of accumulation need not affect distribution.

Contrary to Amadeo's interpretation, however, the actual utilization of capacity in my analysis is completely "endogenous", being determined by the action of the income multiplier in the usual Keynesian fashion.¹⁹ Given the average rate of accumulation resulting from investment fluctuations, I maintained the general possibility that during the process the corresponding (average) saving:capital ratio is obtained through a suitable (average) rate of capacity utilization, and therefore from a suitable (average) output to capital ratio. In other terms: if it is admitted that in each short-

¹⁷ If this were not the case, even in those industries the ratio of profits to capital would exceed that obtainable with the average normal utilization of capacity. This does not deny that the latter rate of utilization was regarded as most profitable for the distribution of demand levels considered normal. Indeed, the higher than normal average utilization which is referred to, comes about precisely as a result of a frequency distribution of demand *different* from that expected as normal — in particular, of a more frequent attainment of relatively high levels of demand. This divergence in the frequency distribution of demand allows for an increase in the profits: capital ratio above the value corresponding to the average normal utilization of capacity.

¹⁸ E. J. AMADEO, *op. cit.*, p. 147 and pp. 157-8.

¹⁹ In my earlier paper the reference to the multiplier is generally implicit in the analysis. An explicit mention is made, however, in the argument put forward at p. 30 of that paper.

run fluctuation the adjustment of saving to investment will come about through variations in the rate of capacity utilization, there is no reason why this should not be true when one considers long-run, i.e. average levels of investment and saving (per unit of capital). The conclusion can thus be reached that the average rate of capacity utilization, and hence the average ratio of income to capital, will generally be such as to adjust the average value of the saving:capital ratio to the average rate of accumulation. As a result, distribution need not be involved in that adjustment.

If any doubt should still persist about the character or "endogeneity" of capacity utilization that this argument entails, we can easily put the question in formal terms and find that capacity utilization appears as a dependent variable. Referring to average values and borrowing Amadeo's symbols, let u be the actual utilization of capacity (which Amadeo identifies with the actual output: capital ratio), b^s the saving:capital ratio, b^i the investment: capital ratio and γ the profit share in output. Assuming with Amadeo that savings coincide with profits, for given values of the accumulation rate and profit share, \bar{b}^i and $\bar{\gamma}$, we can determine b^s and u on the basis of the two equations:

$$(1) \quad b^s = \bar{\gamma} u$$

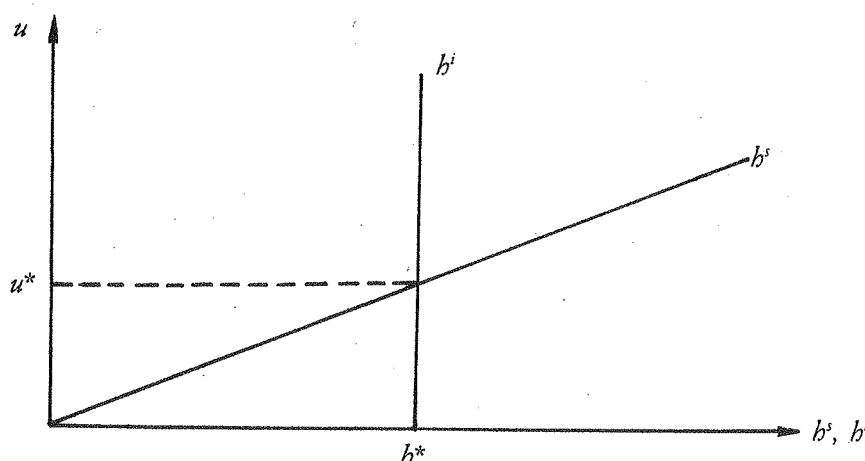
$$(2) \quad b^s = \bar{b}^i$$

The solution for u is obviously

$$u = \bar{b}^i \cdot 1/\bar{\gamma}$$

where, under the assumptions adopted, $1/\bar{\gamma}$ is nothing but the income multiplier, i.e. the reciprocal of the propensity to save out of total income.²⁰

This determination of capacity utilization exactly corresponds to that which would be provided, *ceteris paribus*, by Amadeo's analysis. If we express the problem in a graph:



²⁰ It is somewhat surprising that equation (1) in the text, which can obviously be written as

$$b^s = P/K$$

where P are profits and K is the capital stock, is referred to by Amadeo as "a simplified version

This representation is strictly analogous to Fig. 3, quadrant II of Amadeo's paper,²¹ with the only variant that the investment (or rate of accumulation) function b^i is here independent of capacity utilization, and the value of the accumulation rate appears therefore as a given — a difference with respect to Amadeo's analysis which we shall come back to in the next paragraph. As in Amadeo, the "equilibrium" utilization of capacity, u^* , is established in the figure by the meeting point of the saving function b^s with the investment function b^i , in correspondence with the "equilibrium" value of the rate of accumulation, b^* ; ²² it should be clear from the above, however, that the same value u^* could easily have been determined as a result of the action of the multiplier. Thus, the fact that the latter is never mentioned by Amadeo, who only refers to intersection points of saving and investment functions of the kind represented in the figure above, does not really make his determination of actual capacity utilization different from mine. That fact can however explain, to some extent, his difficulty in accepting the way capacity utilization is determined in my paper.

2. The previous argument was developed by taking the rate of accumulation as *given*. This shows that the "endogeneity" of actual capacity utilization has nothing to do with the determinants of investment — it rather concerns the determination of *saving* (relative to capital) through the level of total income. There seems to be no foundation, therefore, in Amadeo's contention that in order to conceive of capacity utilization as "endogenous", one needs to specify a function in which investment depends on capacity utilization itself,²³ as Amadeo does in his own analysis. Actually, what such an investment function renders "endogenous" is rather the accumulation rate. This represents a real difference with respect to my work, in which the rate of accumulation is instead taken as given, as in Joan Robinson's analysis — which my paper primarily aimed to discuss. But that different treatment of the rate of accumulation in no way implies a difference in the treatment of capacity utilization, no less "endogenous" in my analysis than in Amadeo's.

of the Cambridge equation" (E. J. Amadeo, *op. cit.*, p. 150). Actually, the former equation simply expresses the relation existing, under the given assumptions, between saving and profits per unit of capital, and Amadeo himself seems to regard it as a sort of saving function. The equation at issue only represents, therefore, the "saving side" of the Cambridge equation, which instead expresses the equality of saving *and* investment per unit of capital. Indeed, it is precisely investment, rather than saving, that appears in the left-hand side of the Cambridge equation, and which is therefore connected in the latter equation to the profits:capital ratio.

²¹ *Ibid.*, p. 153.

²² In algebraic terms, our determination of u^* corresponds therefore to that shown by Amadeo at p. 152 of his paper, once the value of the parameter β is taken as zero.

²³ *Ibid.*, p. 151.

I take the opportunity to note, in this regard, that the function by which Amadeo relates the rate of accumulation to the actual (compared with normal) utilization of capacity appears strictly connected to the steady-state character of his analysis, and could therefore hardly be extended to a more general kind of analysis.

According to that function, entrepreneurs react to any divergence between actual and normal utilization of capacity by a change in the opposite direction of the rate of capital accumulation, in the attempt to restore the normal rate of utilization.²⁴ This close relation between the *current* rate of utilization and investment decisions cannot stand, up, however, once the occurrence of fluctuations in capacity utilization is explicitly admitted. As is maintained in my paper, the normal utilization of capacity must then be conceived of as an average of expected fluctuations. This implies that entrepreneurs *expect* to observe, at each instant of time, a rate of utilization different from normal, and that therefore such differences do not necessarily produce any particular reaction on investment plans. According to the effective fluctuations in the utilization rate, even the *average* utilization of capacity obtained over a series of periods could turn out different from normal without entailing any excess or shortage of existing capacity,²⁵ and hence any necessary revision in the plans concerning the future dimension of capacity itself.

In short, a "mechanical" relation between actual capacity utilization and rate of accumulation like that adopted by Amadeo rests on the implicit assumption that entrepreneurs expect the current rate of utilization to be continuously obtained in the future, unless they move away from the present rate of capacity growth. Thus, such an investment function can only fit a steady-state type of analysis precisely like that by Amadeo,²⁶ and will not tolerate the consideration of fluctuations in demand and capacity utilization.

3. A further misunderstanding lies at the origin of Amadeo's claim that in my analysis distribution generally *will* be affected by the adjustment

²⁴ Amadeo's investment function is the following:

$$b^i = \alpha + \beta(u - u_n)$$

where b^i is the desired rate of accumulation and u and u_n are respectively, the actual and the normal rates of capacity utilization (*ibid.*).

²⁵ This might be the case, for example, if the peak levels of output corresponded to those expected, but were reached more frequently than is regarded as normal.

²⁶ Amadeo only admits conditions of growth other than steady in the transition from one steady-growth path to another, characterized by a different rate of accumulation. This reflects his own conception of long-period position, regarded precisely as steady-growth paths, and correspondingly of short-period situations regarded as the phases of transition already mentioned (cf. *ibid.*, p. 148).

of saving to investment (both reckoned as relative to capital). He believes that in my argument one can find the condition that the value of the rate of accumulation equals the product of the *normal* profit share in output by the *normal* utilization of capacity, i.e. that

$$b^* = \gamma_n \cdot u_n$$

where b^* indicates the long-period rate of accumulation, γ_n is the normal profit share and u_n the normal rate of capacity utilization. The presence in Amadeo's discussion of that condition is revealed, in particular, by the fact that the value $\gamma_n u_n$ is one of the points of the equilateral hyperbola $b^* = \gamma u$ with which he represents "the locus of all combinations of the share of profits in output and capacity utilization compatible with the rate of accumulation".²⁷ In other terms, the function mentioned above provides the combinations of the values of the profit share γ and of the utilization of capacity u which ensure the equality of the saving: capital ratio with the given rate of accumulation (remember that in Amadeo's analysis the profit share coincides with the saving: output ratio, and capacity utilization is defined as the output:capital ratio). Along that function the product γu , which obviously coincides with the realized rate of profit, is therefore constantly equal to b^* . Then, taking for granted that the value of the *normal* rate of profit $\gamma_n u_n$ lies on the function amounts to assigning the same value to the rate of accumulation b^* .

By ascribing that particular condition to my analysis, Amadeo is able to claim that there is an inconsistency in the conclusions reached there in. While I argued that divergences of actual from normal utilization allow for the real wage, and therefore distribution, to remain unchanged in the face of changes in the rate of accumulation, Amadeo shows that on the contrary a divergence between actual and normal utilization of capacity will generally call for a change in distribution as the rate of accumulation changes.²⁸

It is easy to see how Amadeo gets this result. The necessary equality between the rate of accumulation and the ratio of saving to capital actually obtained entails, on the one hand,

$$b^* = \gamma_a u_a$$

where γ_a and u_a are the actual values, respectively, of the profit share in output and the rate of capacity utilization. On the other hand, if the value of b^* must also equal the product $\gamma_n u_n$, the above equation can be rewritten as

$$\gamma_n u_n = \gamma_a u_a$$

The latter equation has implications drastically in conflict with my argument. Starting for instance from a situation in which $u_n = u_a$ (and there-

²⁷ *Ibid.*, p. 158.

²⁸ *Ibid.*, pp. 158-60.

fore $\gamma_n = \gamma_a$), assume a rise in the left-hand product (and hence in the accumulation rate) due to a rise in u_n . The right-hand product $\gamma_a u_a$ will have to rise correspondingly, and only if u_a increases to the same extent as u_n , i.e. only if u_a remains equal to u_n , will the profit share not change. Any divergence of u_a from u_n will instead entail a corresponding (and algebraically opposite) divergence of γ_a from γ_n , and therefore a change in distribution with respect to the initial situation.²⁹

The alleged presence of the condition $b^* = \gamma_n u_n$ seems capable of providing, in addition, an explanation of what induces Amadeo to believe that in my analysis the actual utilization of capacity is an exogenous variable. If that condition holds, and actual and normal distribution are, as in my analysis, assumed to coincide (i.e. $\gamma_a = \gamma_n$), an *endogenous* determination of actual utilization would not allow for any divergence of the latter from normal utilization. Indeed, for given values of b^* , γ_n and u_n , the endogenously determined value of actual utilization would obviously be

$$u_a = \frac{b^*}{\gamma_n} = u_n,$$

this being the rate of utilization obtainable as a result of the income multiplier — or, which is the same, the rate in correspondence with the intersection point of Amadeo's saving and investment functions. It follows that if u_a is allowed to diverge from u_n , as is maintained in my paper, it must be conceived of as *exogenous*. But then the ruling profit share cannot also be taken as exogenous, and hence Amadeo's criticism to the invariance of distribution in my analysis.

The condition $b^* = \gamma_n u_n$ is however completely alien to my analysis. The reason for this becomes immediately evident if one gives one's mind to what the right-hand side of that equality represents. The product $\gamma_n u_n$ can be defined as the *normal* saving:capital ratio — as the product of the normal values of, respectively, the saving:output ratio (equal to the profit

²⁹ That just considered in the text is the case Amadeo explicitly deals with in his criticism. However, he also mentions the possibility that in what he interprets as my analysis, a divergence of actual from normal capacity utilization *does* allow, although subject to particular conditions, for distribution not to change in the face of a change in the rate of accumulation (*ibid.*, p. 160). The possibility Amadeo refers to, which does *not* exist in the case considered in the text, could instead arise, indeed under very restrictive assumptions, if the initial values of γ_a and u_a were taken to be different from their normal counterparts — for instance, $\gamma_a^{(0)} > \gamma_n$ and $u_a^{(0)} < u_n^{(0)}$, although always with $\gamma_a^{(0)} u_a^{(0)} = \gamma_n u_n^{(0)} = b^*$. In the face of an increase (decrease) in b^* associated to an increase (decrease) in u_n , distribution would not change (i.e. $\gamma_a^{(1)} = \gamma_a^{(0)}$) if u_a increased (decreased) right proportionally to u_n , i.e. if $u_a^{(1)}/u_a^{(0)} = u_n^{(1)}/u_n^{(0)}$. Amadeo does not seem to realize, however, that what in my paper is allowed for by differences between actual and normal utilization of capacity is the persistence, in the face of changes in the rate of accumulation, of a given *normal* distribution of income — and not of a different from normal distribution! Even in this case, therefore the constraint he sets to the value of the rate of accumulation produces results that are clearly in conflict with the conclusion of my analysis.

share) and the output: capital ratio (which coincides, in Amadeo's definition, with the rate of capacity utilization). In my paper both the values of γ_n and u_n are in fact taken as given, which entails the normal ratio of saving to capital being conceived of as determined independently of the rate of accumulation. As a consequence, the equality under discussion would imply the adjustment of investment to a given amount of saving (both reckoned as ratios to capital). This would patently be antithetic to the principle that guides my analysis, according to which it is saving that adjusts to investment.

In fact, my paper also takes the rate of accumulation as an independent given, which the ratio of saving to capital actually obtained adjusts to. Thus, contrary to the condition in question, the accumulation rate, and therefore the actual saving:capital ratio, can and generally will differ, in my analysis, from the normal saving: capital ratio, — just as the realized profit rate will differ from the normal rate of profit.³⁰ Using Amadeo's symbols, and assuming that the actual profit share coincides in any case with the normal one, this can be expressed as follows:

$$b^* = \gamma_n u_a \cong \gamma_n u_n,$$

where it clearly appears that the actual utilization of capacity u_a is capable of accommodating excesses or deficiencies in b^* with respect to the product $\gamma_n u_n$, while the profit share remains unaltered at the value γ_n .³¹

4. A further point of Amadeo's analysis that deserves consideration is, in conclusion, his claim that if changes in capacity utilization are taken into account, what he calls the Classical inverse relation between the real wage and the rate of profit does not necessarily hold. In his view the two variables just mentioned can on the contrary vary in the same direction, once the effects of changes in the real wage on aggregate demand and capacity utilization are considered.

He illustrates this argument by referring to a whole "family" of inverse wage-profit curves, each corresponding to a different rate of capacity utilization. In particular, a higher rate of utilization is assumed to entail an

³⁰ The equality between rate of accumulation and normal saving: capital ratio holds on the contrary within analyses, as for example that by Joan Robinson, in which the rate of accumulation *determines* the normal distribution of income, and therefore the normal rate of profit. Even in those analyses, however, it is saving that adjusts to investment — although this is assumed to happen *via* changes in distribution, rather than in the level of income.

³¹ In connection with the point just discussed in the text, it must be noted that there is no foundation for Amadeo's idea that I regard investment decisions as directly influenced by changes in the normal utilization of capacity (cf. *ibid.*, p. 158). In my analysis those changes would rather represent something like changes in the dominant methods of production, i.e. events that primarily affects normal prices and (for a given real wage) the normal rate of profit. This does not deny that such effects on relative prices and the profit rate may ultimately affect investment, but those would only be indirect effects, the entity and direction of which cannot be assessed in a general way.

entirely upper wage-profit curve, which means that for any given real wage (below the maximum) the higher the rate of utilization of capacity, the higher is the rate of profit.³²

As should be evident, Amadeo's alleged reversal of the Classical (but, incidentally, also Neoclassical) wage-profit relation rests on the idea that the relation at issue is affected by changes in the *actual* utilization of capacity. This in turn is a consequence of the fact that in the type of equations he uses to express the normal prices of products, and from which the wage-profit relations are obtained, capacity utilization is precisely reckoned at its actual rate.³³ Thus, although Amadeo refers to the notion of normal utilization as distinct from actual utilization, it is the latter concept that in his analysis enters into the determination of normal prices. This hardly appears to be consistent with the notion of normal prices itself. By their very nature those prices must refer to the most profitable conditions of production than can be implemented (to a sufficiently large scale) in the given circumstances. In particular, the volume of fixed capital per unit of output relevant to those prices can only be that which corresponds to the normal utilization of capacity — the latter precisely representing the output: capacity ratio that entrepreneurs regard as most profitably obtainable in the circumstances considered.

It follows that, being reckoned according to an output: capacity ratio that will generally be higher or lower than normal, Amadeo's prices entail conditions of production that either are not the cheapest ones, or must be viewed as unrepeatably favourable. Those prices cannot therefore be considered as values which actual prices tend to adjust to, nor, in any sense, "production" or "supply" prices of commodities.

Once it is acknowledged that the rate of capacity utilization implicit in normal prices can only be the normal one, for a given value of the latter (and for given technical conditions) just one wage-profit curve can be drawn from the system of normal price equations and can therefore legitimately be used to represent the traditional relation between real wage and rate

³² *Ibid.*, p. 151, fig. 1.

³³ Although Amadeo does not use the term "normal price", the fact that he refers to the price equation as "equation of production" (*ibid.*, p. 150) suggests that he regards the price expressed by the equation itself as a price of production, and therefore as a normal price. He writes a single price equation like the one below, which refers to the production of aggregate output by means of labour and aggregate output itself, employed as ever-lasting capital:

$$p = \frac{w}{\pi} + p \frac{r}{u},$$

where p is the price of a unit of output, w is the (nominal) wage-rate, π is the productivity of labour, r is the profit rate and u is the output: capital ratio, which Amadeo identifies with the rate of utilization of capacity. Even without extracting the wage-profit relation implicit in the equation above, a look at the latter is sufficient to see that for given values of the real wage w/p and of the labour productivity π , an increase (decrease) in u entails a proportional increase (decrease) in r .

of profit. Along that curve the profit rate is obviously that which would be obtained, for any level of the real wage, with the normal utilization of capacity. This profit rate, which in turn is definable as *normal* in the present context,³⁴ will therefore maintain an univocally inverse link with the real wage, irrespective of what happens to the actual utilization of capacity.

This is not to deny, that, as is argued in my analysis, the realized ratio of profits to capital will be affected by changes in actual capacity utilization, and that in principle it might therefore increase in the event of a rise in the real wage — owing to the positive effects which that rise might have on demand and capacity utilization. This possibility shows once more the need for a clear distinction between the normal rate of profit and the actual profits:capital ratio. On the contrary, this distinction appears to be largely missing in Amadeo's analysis.

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³⁴ For the rate of profit to be at its normal value it would also be necessary for the real wage to equal its respective normal level. However, divergences of the effective real wage from normal are not in question here, and whether the profit rate coincides with its normal value depends only on the degree of capacity utilization at which it is calculated.