Normal Prices and the Theory of Output: Some Significant Implications of Recent Debate*

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I. INTRODUCTION

Considerable discussion has emerged in recent literature over the issue of how best to integrate Keynes's principle of effective demand as a theory of output with the Sraffian determination of relative prices and the rate of profit (or alternatively the real wage).[1] The relative prices determined in Sraffa's *Production of Commodities* yield a uniform rate of profit across sectors; and such prices are considered to be important as centres of gravity for actual prices on the supposition that the uniformity of profit rates would be the eventual outcome of the movement of capital between sectors in line with differentials in profit rates.[2] The task of integrating this approach

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[1] The main references are E. J. AMADEO, "The Role of Capacity Utilization in Long-Period Analysis". *Political Economy*, II, n. 2, 1986, and "Expectations in a Steady-State Model of Capacity Utilization". *Political Economy*, III, n. 1, 1987; R. CICCONE, "Accumulation and Capacity Utilization: Some Critical Considerations on Joan Robinson's Theory of Distribution". *Political Economy*, II, n. 1, 1986, and "Accumulation, Capacity Utilization and Distribution: A Reply". *Political Economy*, III, n. 1, 1987; M. COMMITTERI, "Some Comments on Recent Contributions on Capital Accumulation, Income Distribution and Capacity Utilization". *Political Economy*, II, n. 2, 1986, and "Capacity Utilization, Distribution and Accumulation: A Rejoinder to Amadeo". *Political Economy*, III, n. 1, 1987; J. EATWELL, "The Long-Period Theory of Employment". *Cambridge Journal of Economics*, VII, n. 3/4, September/December, 1983. J. EATWELL and M. MILGATE, "Introduction" in J. Eatwell and M. Milgate (eds), *Keynes's Economics and the Theory of Value and Distribution*, London, Duckworth, 1983; P. GAREGNANI, "Two Routes of Effective Demand: Comment on Kregel", in J. Kregel (ed), *Distribution, Effective Demand and International Relations*, London, Macmillan, 1983; H. D. KURZ, "Normal Positions and Capital Utilization", *Political Economy*, II, n. 1, 1986; E. NELL, "Review of M. Milgate 'Capital and Employment'", *Contributions to Political Economy*, II, March 1983; F. VIANELLO, "The Pace of Accumulation", *Political Economy*, II, n. 1, 1985.

[2] The implicit assumption here being that this movement of capital would equalise profit rates through changes in relative prices. On the significance of Sraffa's produtction prices for

to price determination with Keynes's approach to output revolves around the question of whether the outputs which serve as data in Sraffa's model can be considered as long-run equilibrium quantities; and if so, whether the long-run equilibration of output is achieved exclusively by means of changes in productive capacity or by changes in both productive capacity and capacity utilization. These questions imply a further question of whether there is some desired ratio of output to productive capacity implicit in Sraffa's prices (hereafter normal prices): in other words, does the adjustment of prices to their normal levels and the concurrent equalisation of profit rates entail the simultaneous adjustment of capacity to the desired level in relation to demand and the restoration of a "normal" degree of capacity utilization? The main focus of the present paper is to critically appraise as well as extend some of the more significant points arising out of the debate over this question, viz., what normal prices may imply about the relation between output and capacity. Attention is focused on what can be said in this regard concerning a capitalist economy subject to persistent cyclical disturbance.

The following discussion begins with a critical review (Sections II and III) of the work of Vianello with emphasis on the proposition that situations characterised by normal prices are also characterised by the full-adjustment of capacity to demand. The alternative view of normal utilization and normal prices advanced by Ciccone is briefly discussed (Section IV), with a view to the question of a link between normal prices and full-adjustment. Making use of Ciccone's view of normal utilization, the analysis proceeds to an investigation of the argument that the equality of actual and normal prices does not imply equality between actual and normal utilization (Section V). The implications of this analysis for the relation between normal prices, the realised ratio of profits to capital and the rate of accumulation are then used to assess Vianello's claim that the rate of accumulation and normal prices and distribution are linked in a systematic way (Section VI). The discussion then turns to a more formal analysis of the link between normal prices and normal utilization; which is used to consider the extent to which normal prices can prevail independently of the full-adjustment of productive capacity in line with demand (Section VII). The paper concludes with a brief note on the appropriate direction for further research.

II. Vianello's two-sector model

Vianello analysis[3] focusses on the determination of the quantities of outputs and of means of production which figure as data in the Sraffian determination of normal prices and distribution. Arising out of that analysis in the interesting suggestion of a connection between the movement of prices to their normal levels and the equilibration of output by means of the restoration of a particular ratio of output to productive capacity. According to Vianello, Sraffa's price equations refer to "fully-adjusted situations" (hereafter FAS) by which Vianello means situations where productive capacity has adjusted to the level and composition of demand. The outputs associated with FAS would be determined according to the principle of effective demand whereby (in its long-run interpretation) the changes in output which would adjust saving to investment over the long-run occur via changes in productive capacity.[4] Thus, in FAS, saving will be equal to investment, the rate of profit is uniform and capacity has adjusted to demand in each sector so that, given demand levels in each sector, capacity utilization is at what is termed the "normal" level; the latter represented in Vianello's analysis by a desired ratio of output to the capital stock. Looking at the changes between any two FAS, since utilization is unchanged, saving adjusts to investment exclusively by means of changes in the amount of productive capacity. In this sense changes in capacity utilization do not play any role in the long-run equilibration of output.

Central to Vianello's analysis is the identification of these equilibria with positions characterised by normal prices and a normal uniform rate of profit. In turn this identification is dependent on Vianello's conception of the normal (i.e. general) rate of profit; and on his supposition that the system eventually returns to a degree of capacity utilization, defined as normal, representing the adjustment of capacity to demand. In order to highlight the importance of both, it is useful to consider briefly the two-sector model employed by Vianello. Consider two single-product sectors each using a combination of labour and a fixed capital good to produce a wage-good and the fixed capital good respectively. With an exogenously determined real wage, the normal rate of profit and relative prices are assumed to be determined along Sraffian lines. Assuming all wages are spent and all profits are saved, the real wage "determines" the distribution of labour between the wage-good and capital-good sectors, given output per worker in the wage-good sector according to the relation

$$w = y_c . (L_c/L) \ldots\ldots (1);$$

[3] F. Vianello, op. cit.

[4] The term "long-run" in the following discussion refers to a period of time sufficient, as Ciccone puts it, "for the gravitation of prices and quantities produced around their respective normal values to manifest itself" (R. Ciccone, "Accumulation and Capacity Utilization", op. cit. p. 23). Since this gravitation is assumed to involve changes in capacity between sectors then this notion of long-run also allows time for investment to affect productive capacity.

where w is the real wage, y_c is output per worker in the wage-good sector and (L_c/L) is the proportion of total employment in this sector. Investment and capital are assumed to consist of the same commodity so that the rate of accumulation can be written as

$$I/K = u_i \cdot (K_i/K) \ldots\ldots\ldots (2),$$

where u_i is the ratio of output to capital in the capital-god sector and K_i/K is the proportion of total capital employed in this sector. The relation between the ratio of capital stocks and the ratio of employments in the two sectors is as follows

$$K_i/K_c = L_i/L_c \cdot [(Y_i/L_i) \cdot (L_c/Y_c) \cdot (K_i/Y_i) \cdot (Y_c/K_c)]$$

and hence

$$K_i/K_c = L_i/L_c \cdot (y_i/y_c) \cdot (u_c/u_i) \ldots\ldots\ldots (3),$$

where subscripts i and c refer to the capital-good and wage-good sectors respectively, Y, K and L refer to output, the capital stock and employment respectively, and y and u refer to output per worker and output per unit of capital respectively. Thus the ratio of capital stocks and the ratio of employments in the two sectors are related according to output per worker ratios and output to capital ratios. Output per worker is taken as given in each sector and hence the relationship between the distribution of employment and the distribution of capital stocks will depend on output to capital ratios. In Vianello's analysis the latter are taken as given in FAS, on the basis of the assumption that capacity utilization is restored to its normal level in each sector in FAS.[5] Thus in a comparison of FAS an unchanged capcity utilization allows for a definite connection between the distribution of employment and the distribution of capacity between sectors.

In turn, according to equations (1) and (2) above, the real wage w can be related to the rate of accumulation I/K. Rewriting equation (3) as

$$K_i/K_c = (L_i/L_c) \cdot A \ldots\ldots\ldots (3a),$$

where

$$A = (y_i/y_c) \cdot (u_c/u_i).$$

Hence

$$K_i/K_c = (K/K_c) - 1 = (L_i/L_c) \cdot A = [(L/L_c) - 1] \cdot A,$$

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[5] The implicit assumption here is that the output capacity of a unit of fixed capital is given, so that a given utilization of capacity (output to output capacity) implies a given output to capital ratio.

and thus

$$K_c/K = 1/[(L/L_c).A - A + 1] \ldots\ldots (3b).$$

Equation (2) can also be rewritten as

$$I/K = u_i.[1 - (K_c/K)] \ldots\ldots (2a).$$

Combining equations (2a) and (3b) with equation (1) yields

$$I/K = u_i.[1 - 1/[(y_c/w).A - A + 1]] \ldots\ldots (4).$$

Hence, if y_i, y_c, u_c and u_i are all given — the former two are by assumption and the latter two are given for comparisons of FAS — then A is given and I/K is placed in a definite relation to the real wage w;[6] and this relation will be inverse since w in related inversely (directly) to the proportion of capital installed in the capital-good (wage-good sector), by equations (1) and (3b), and the latter is related directly (inversely) to the rate of accumulation, by equation (2). As is well known, the Sraffa price system entails an inverse relation between the real wage and the normal rate of profit, so that Vianello's analysis also implies a positive relation between the rate of accumulation and the normal rate of profit.

What this relation implies is that whatever is happening to investment levels, the rate of accumulation in FAS is endogenously determined in line with the given real wage and hence with the distribution of employment and capital between sectors. With a given real wage, an increase in the level of investment will leave the rate of accumulation unchanged: with a given real wage, the distribution of employment between sectors (equation (1)) will be unchanged and, in combination with a given A, the distribution of capacity between sectors (equation (3b)) will be left unchanged. The capital stock adjusts to a level where, given saving out of profits and the rate of profit as well as the normal degree of capacity utilization, the level of output will generate saving sufficient to match investment. Given also the saving propensity out of profits, the precise (direct) relation between the rate of accumulation and the rate of profit will be determined.

III. Vianello on fas and normal prices — a critical view

1. The foregoing analysis suggests that the interpretation of equation (4) as a systematic (inverse) relation between the rate of accumulation and the real wage (in turn, implying a positive relation between the rate of accumulation and the rate of profit), rests crucially on the identification

[6] F. Vianello, *op. cit.*, p. 78 n.

of normal prices and FAS, where the latter is identified with capacity utilization at the normal level. What is important for the purposes of the present discussion is the rationale for this identification. As suggested above, Vianello's reasoning on this point appears to involve two propositions. The first is the proposition that the normal ratio of output to capacity would represent the centre of gravity for the actual ratio of output to capacity; and one that the process of investment would aim and eventually be successful at restoring in each sector. While Vianello admits the possibility that attempts to adjust capacity to restore normal utilization may be frustrated, he maintains that "under-utilisation, as well as over-utilisation, of productive capacity is by its very nature a temporary phenomenon [and as such] suppose [s] that the tendency to produce under normal conditions will prevail, eventually leading to a new fully-adjusted situation"[7].

The second proposition is that the normal (uniform) rate of profit refers to a particular level of the realised ratio of profits to capital, so that Vianello is led to claim that "the prices which appear in [Sraffa's] equations are ...the "natural prices" of commodities, and the rate of profits which enters into the natural prices is the ordinary or average rate, conceived as the centre of gravity of the actual ratio of profits to the value of capital. Now it is obvious that only the rate of profits observable in the fully adjusted situations can be taken as "ordinary" in this sense".[8]

One interpretation of Vianello's argument, given the two propositions referred to above, would be as follows. Assume that capital mobility between sectors in line with past differentials in sectoral rates of profit has brought about a pattern of relative prices such that, at prevailing capital to output ratios, the rate of profit is uniform across sectors. Suppose in addition that in some sectors at least, capacity utilization and hence (on Vianello's assumptions) the capital to output ratio differs from the normal level. Can the prevailing pattern of relative prices be considered as normal? By Vianello's reasoning, utilization must change in at least some sectors; and, since the relevant rate of profit is the realised ratio of profits to capital, it is possible that the prevailing uniformity of profit rates would be disturbed. If so, capital mobility engineered by the appearance of differentials in profit rates would set into play changes in relative prices. Hence, the initial pattern of relative prices and the corresponding rate of profit could not be considered persistent in the sense that prices yielding a uniform profit rate when measured at normal utilization rates *are* persistent. Since the normal rate of profit is defined by Vianello as the centre of gravity for the actual rate, the former could therefore only show itself — along with normal prices — in FAS.

[7] *Ibid.*, p. 82.
[8] *Ibid.*, pp. 83-84.

2. The above interpretation of Vianello's analysis calls for the following comments. The first point to note is that Vianello suggestion that normal prices and distribution should be related to the full-adjustment of productive capacity in relation to demand in some manner is, in the opinion of the present writer, a plausible one. Assuming that the formation of the normal rate of profit is due to the 'movement of capital' between sectors in line with differentials in profitability, the proposition that the normal rate of profit should be calculated on the basis of utilization in fully adjusted situations has intuitive appeal. The rate of return that would serve as the basis for the allocation of capital between sectors must surely be that which is calculated on the basis of operating capacity which is considered to be of the appropriate size in relation to demand.

However, it is not clear that this should necessarily require that each sector be fully-adjusted when actual prices are at their normal levels and hence yield a uniform rate of profit. As indicated above, such a result follows from Vianello's analysis only because it is assumed firstly, that the normal or general rate of profit refers to the uniformity of the actual ratio of profits to capital across sectors (so that actual and normal utilization rates are equal where normal prices prevail); and, secondly, that the full-adjustment of the capital stock in line with demand is represented by the equality of actual and normal utilization rates. However, it is suggested below (Sections IV and V) in the discussion of Ciccone's work that both of these assumptions are open to question.

In addition, the identification of FAS and actual prices at normal levels places a question mark over the relevance of normal prices themselves; since the adjustment of prices to normal levels appears to be tied to the nature of the adjustment process which is supposed to restore FAS. In other words, the question arises as to whether the time taken for FAS to be established is related to the time it takes for sectoral rates of profit to equalize[9]. The important implication of this question appears to be that, if the adjustment of capacity to restore FAS involves a long period of time, should it not be assumed (and this is implied by Vianello's analysis) that the convergence

[9] The difficulties arising out of Vianello's association of normal prices and FAS have been highlighted by a number of writers; in particular, Ciccone, whose position is discussed below (sections III and IV), Amadeo, "The Role of Capacity Utilization", *op. cit.* and Committeri, "Some Comments" *op. cit.* Amadeo's analysis is primarily concerned with the stability of the normal degree of capacity utilization — understood as producers' desired ratio of output to capacity — and the implications of this for Vianello's real wage-rate of accumulation connection. However, the relevance of Amadeo's analysis is open to question, since he treats FAS as points along a steady-growth path and the equality of actual and normal utilization is not taken as a characteristic of FAS; both points being in contrast to Vianello's analysis. Moreover, it is open to question whether Amadeo's analysis sheds light on the relation between normal prices and capacity utilization, since no distinction is made between the realised ratio of profits to capital and the normal rate of profit (cf. R. CICCONE, "Accumulation, Capacity Utilization and distribution", *op. cit.*, M. COMMITTERI, "Some Comments", *op. cit.*, and "Capacity Utilization, Distribution and Accumulation", *op. cit.* on Amadeo's analysis).

of rates of profit towards the normal level would be similarly frustrated for long periods of time? However, given that the rate of accumulation in FAS does not indicate anything about the behaviour of investment when the system is not fully-adjusted; and given the possibility that the system is not fully-adjusted for lengthy periods of time, it is not clear that the analysis of output determination by reference to FAS is the appropriate one to be combined with the Sraffian determination of prices. This point is raised by Committeri, who questions the relevance of Vianello's FAS: "the only information that an FAS is able to give is that, if the economy finds itself in such a situation, and if the "normal" rate of profit is positive, the accumulation rate will also be positive... therefore, the economy will be growing at that precise moment in time. In this sense, an FAS is devoid of any practical relevance for the study of long-run tendencies... [and] the basic difficulty seems to lie in the fact that Sraffa's production prices are viewed [by Vianello] as anchored to situations like FAS".[10] The implication appears to be that the identification of FAS with Sraffa's production prices may also throw open to question the significance of the latter for long-run analysis.

It is important to stress however that the force of this criticism rests on assumptions about the timing of the process of capital stock adjustment and thus about the interaction of the multiplier and the process of investment. In particular this timing, depends, *inter alia*, on how responsive investment is to divergences between actual capacity utilization and the normal or desired degree of capacity utilization. Unfortunately there is little that can be drawn from Vianello's analysis in this regard, since Vianello does not deal in any depth with the determination of the degree of capacity utilization which is to be regarded as normal and thus with the issue of the nature and timing of the process which would restore a FAS.[11] Nevertheless the above considerations raise the question of whether it is possible to link FAS with normal prices (since, as suggested above, some connection seems intuitively plausible), but in a way which does not require normal prices and FAS to prevail simultaneously. In particular, it is important to question whether the degree of capacity utilization implicit in normal prices *does* indicate the relation between demand and capacity when the latter is fully-adjusted. To answer this question requires a clearer treatment of the nature of normal utilization than is provided by Vianello.

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[10] M. COMMITTERI, "Some Comments", *op. cit.*, p. 178.

[11] One possible interpretation of Vianello's position however is that investment would not be responsive to any and every divergence: as Kurz points out, Vianello's normal output to capacity ratio — if considered to be less than the maximum — is not profit-maximising, since higher levels of demand can be accommodated by means of higher utilization of existing capacity without any fall in the share of profits in output (H. D. KURZ, "Normal Positions", *op. cit.*, pp. 51-52). Expectations of fluctuations in demand could justify such excess capacity (at normal utilization rates), which would imply that producers would not respond — by varying capacity — to every short-run divergence between actual and normal utilization.

It also requires a critical look at Vianello's suggestion that the rate of profit relevant to the discussion of normal prices is the realised ratio of profits to capital. Some assistance in taking these issues further is provided by Ciccone's contribution which is briefly discussed in the following section.

IV. NORMAL CAPACITY UTILIZATION: CICCONE'S ANALYSIS

1. Although Ciccone's analysis, like that of Vianello's, provides for a connection between the full-adjustment of productive capacity and normal prices, it differs significantly from Vianello's as to the nature of this connection. According to Ciccone, neither the equality of actual and normal degrees of capacity utilization nor the full-adjustment of capacity is necessary for normal prices to prevail. The source of this difference lies in the particular notion of normal utilization provided by Ciccone as well as the fact that his analysis is explicitly conducted in the context of a system where fluctuations in demand are a normal occurrence. For Ciccone, the utilization of capacity which enters into the calculation of normal prices — and thus into the calculation of the normal rate of profit — is the average utilization that would be anticipated on newly installed plant, where "the size of this plant would be of course what entrepreneurs would consider most appropriate to the expected demand for products".[12] The appropriateness of this plant would be reflected in a plant size which is sufficient to cope with the expected peaks of demand plus any desired margin of excess capacity. Normal utilization would then be determined by the average demand level expected — over a length of time presumably related to the life of new plant — relative to this particular plant size. Thus, according to Ciccone, normal utilization refers only to the utilization that would be anticipated on new investment.

The basis of Ciccone's argument, that it is utilization expected on new investment which is relevant for normal prices and distribution, appears to be as follows: assuming that normal prices (if established) are established by means of the movement of capital between sectors, then the corresponding general rate of profit would be that anticipated on new investment, that is, on newly installed capacity; since it is on the basis of anticipated rates of profit on new capacity that investment and disinvestment between sectors would take place. As Ciccone argues, "the uniformity in question [i.e. of anticipated rates of profit across sectors] seems to require...that, for given levels of demand, the relative sizes of the industries be such that (gross) investment is no more profitable in one industry than in another, and not also that the absolute size of overall capacity should be in a particular relation to aggregate demand".[13]

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[12] R. CICCONE, "Accumulation and Capacity Utilization", *op. cit.*, p. 26.
[13] *Ibid.*, p. 24.

Ciccone's argument would therefore appear to imply that normal prices represent a vector of relative prices such that, at those prices and costs estimated on the basis of normal utilization, the expected profit flow expressed as a rate of return on the value of gross investment would be equalised across sectors. Such a configuration of prices, given technology and expectations about demand, would presumably leave no incentive for investment designed to change the sectoral composition of the overall capital stock.[14]

2. It has been suggested above, however, in connection with Vianello's work, that it is plausible to suppose some relation between the utilization of capacity implicit in normal prices and distribution and situations where producers have the desired amount of capacity in relation to demand. The question arises whether this would still be the case with Ciccone's notion of normal capacity utilization since it, unlike Vianello's, does not refer to the ratio of overall capacity to demand, but only that part represented by gross investment. It should be clear however that Ciccone's normal utilization would still be related to producers' desired position with respect to their overall capacity, assuming that the process of investment is designed to bring about the full adjustment of capacity. Thus, the amount of capacity relevant to the calculation of normal utilization cannot be unrelated to what is considered the appropriate size of capacity in relation to demand. Ciccone appears to make a similar point in arguing that "the degree of utilization that contributes to determining [normal prices] must be understood as referring to equipment which constitutes or might constitute gross investment... [and the size of this investment] would constitute an expression of the tendency... for capacity to adjust to demand".[15]

In other words, if it is assumed that the magnitude of investment relevant to the calculation of normal utilization is that required to bring existing capacity to its fully-adjusted level; and it is further assumed that utilization planned for new capacity is a function of that planned for overall capacity, it follows that normal utilization must be a function of the utilization planned for a fully-adjusted capital stock. Simplifying further, if technical progress is neglected, it may be assumed that newly installed plant is utilized to the same degree as existing plant, so that the average utilization expected for new plant is the utilization that producers anticipate will be the case when their capacity is fully-adjusted.[16]

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[14] Of course this definition of normal prices implicitly assumes that the lack of incentive for changes in the composition of the capital stock entails the absence of forces acting to alter the existing configuration of relative prices.

[15] *Ibid.*, p. 26.

[16] A view of normal utilization as that estimated for the fully-adjusted capital stock appears to be held by Committeri as well (M. COMMITTERI, "Capacity Utilization, Distribution and Accumulation", *op. cit.*, p. 93).

Thus, although normal utilization as defined by Ciccone refers to newly installed capacity, it is possible to relate normal utilization, and hence normal prices, to what producers consider to be the desired dimension of productive capacity in relation to demand. The question remains whether this relation entails that situations where normal prices prevail are necessarily situations where capacity is fully-adjusted to demand, as in Vianello's analysis. With regard to this question, the remaining sections attempt a critical appraisal of two key propositions advanced by Ciccone: that actual and normal utilization rates can differ in situations where normal prices prevail; and, that the capital stock in each sector need not be fully-adjusted in line with demand in situations where normal prices prevail.

V. Actual utilization, normal utilization and normal prices

1. It will be recalled from Section's II and III that the identification of situations where normal prices prevail and situations where utilization is at the normal level is crucial to the interpretation of equation (4), above, as depicting a systematic relation between normal prices and distribution and the rate of accumulation. It is therefore of considerable interest to clarify the basis for the alternative claim by Ciccone that "the tendency towards long-period [i.e. normal] prices does not in fact seem to require the simultaneous gravitation of the effective [i.e. realised] utilization of capacity around its normal level... Nor... 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) characterises long-period prices".[17]

In assessing the basis for this claim, it is assumed in line with the argument above (section IV),that utilization anticipated for new capacity, and thus normal utilization, is determined by the utilization planned for a fully-adjusted capacity. For simplicity, normal utilization is assumed to be equal to the latter, which is defined here as the ratio of average expected demand Ye to the capital stock K^* seen as appropriate to the expected pattern of demand. Hence the equality of actual and normal utilization rates (taking output to capital ratios u_a and u_n respectively as indices of actual and normal capacity utilization) would entail for each sector,

$$u_a = Y_a/K_a = Y_e/K^* = u_n;$$

where Y_a is the realised average (over the cycle) level of output and K_a the actual capital stock.

It could be argued that mechanisms do exist for u_a and u_n to adjust in

[17] *Ibid.*, p. 24.

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line with one another: average expected demand (Y_e) would over time adjust to average actual demand (Y_a), given that the expected pattern of demand is a function of the pattern of demand realised in the past. As well, it can be supposed that the process of investment eventually brings into line actual (K_a) and desired (K^*) capital stocks. Ciccone's rejection of the proposition that the equality of actual and normal degrees of capacity utilization is necessary for the adjustment of prices to their normal levels appears to involve two points: first, the adjustment of expected demand in line with realised demand patterns will occur only over long periods of time[18] and will likely be longer than is required for the adjustment of prices to normal levels. Second, the adjustment of capacity to the desired level in relation to expected demand is also likely to involve long periods of time. Thus Ciccone argues that "the achievement of a particular size of capacity relative to that of demand appears itself to be a process that is liable to be frustrated for long-periods of time... since a general accumulation or decumulation of capital cannot fail to have a wide-reaching influence on aggregate demand itself. 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, that the "long-period" itself".[19]

Ciccone's rejection of a necessary connection between the adjustment of prices to normal levels and the movement of actual and normal utilization into line with one another appears to rest therefore on an argument about the timing of the former process *vis-à-vis* the timing of the mechanisms that could be expected to bring actual and normal utilization into line with each other.

2. However it is not clear that Ciccone's argument on the time required for the adjustment of actual to desired capacity is all that convincing when allowing for the implications of Ciccone's own analysis regarding the process of investment. Although it may be plausible to assume that Y_e adjusts to Y_a only very slowly, this same assumption has implications for the extent to which attempts to adjust K_a in line with K^* are likely to be frustrated through the effects of investment on demand and in turn on investment. The extent of this 'frustration' depends as much on the effects of changes in actual demand on investment decisions as it does on the effects of investment on demand working through the multiplier. To the extent that expected demand, and therefore investment, reacts sluggishly to changes in realised demand, then the volatility of any interaction between the multiplier and the process of investment is presumably also limited. Similar reasoning has led Eatwell to claim that "the usual oscillations and instabilities

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[18] *Ibid.*, p. 36.
[19] *Ibid.*, p. 25.

of multiplier-accelerator models will be damped by the fixed level of demand associated with the [given] state of long-term expectation".[20] In other words, Ciccone's assumption of a slowly changing expected pattern of demand, and thus a slowly changing Y_e (and what amounts to Eatwell's reference to a given state of long-term expectations), could conceivably work in favour of producers' attempts at adjusting capacity to a desired level in relation to expected demand. Ciccone's argument about the timing of such adjustment *vis-à-vis* the timing of price adjustment is therefore open to question.

Perhaps more importantly, and despite leaving open to question at least part of Ciccone' argument, these same considerations provide a clearer means (than is provided by Ciccone himself) of explaining the possibility raised by that argument, viz., that normal prices can prevail independently of actual and normal degrees of capacity utilization coinciding. Assume, for example, that initially the expected pattern of demand matches the actual pattern of demand and thus $Y_a = Y_e$, but capacity is seen as being deficient, so K_a is less than K^*. Suppose also that K_a is brought — by means of investment — to the level K^* simultaneously with the adjustment of prices to their normal levels. If this is achieved without changing either Y_a or Y_e, then normal prices would prevail simultaneously with the equality between actual and normal utilization. But it is likely that the investment required to bring actual capacity into line with the desired level will affect the actual pattern of demand and in so doing affect the average level of demand Y_a. However, the above considerations also suggest that the sluggishness of Y_e with respect to actual demand may make the adjustment of capacity faster and less volatile, in which case the changes in actual demand as a result of that investment need not give rise to changes in expected demand in the time taken to adjust capacity to its desired level. Thus the process of adjusting capacity to its desired level in relation to expected demand, if successful, will affect Y_a, though not necessarily Y_e, in which case $K_a = K^*$, but Y_a has changed relative to Y_e and hence Y_a/K_a does not equal Y_e/K^* in the position where normal prices prevail and where capacity is at its desired level in relation to demand. If Y_e changes as a result of changes in Y_a, K^* may or may not change, since by Ciccone's analysis the same capital stock may be considered most appropriate for a number of cyclical patterns of demand and hence more than one size for

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[20] J. EATWELL, "Theory of Employment", *op. cit.*, p. 12. In fact Ciccone himself makes an appeal to the notion of the state of long-term expectation as used by Keynes in the General Theory in attempting to clarify the expectations of demand which figure in the calculation of normal capacity utilization (Ciccone op. cit., p. 36 n). The same concept of Keynes's is also referred to by Eatwell. Moreover, in a more recent article responding to Amadeo, Ciccone himself emphasises the sluggishness of investment decisions with respect to changes in the actual degree of capacity utilization, or more precisely, with respect to divergences between actual and desired or normal utilization (cf. R. CICCONE, "Accumulation, Capacity Utilization and Distribution", op. cit., pp. 105-106).

Y_e.[21] Hence, even where Y_e changes, the possibility still exists that Y_a changes relative to Y_e with little change or no change in K^*.

Thus the possibility of a divergence between actual (average) and normal utilization with normal prices prevailing arises because of the long-term nature of expectations on which Ciccone hinges the determination of normal utilization; as well as what this appears to imply about the responsiveness of investment to variations in demand.

VI. Normal prices, distribution and the rate of accumulation

The analysis of the previous section has three important implications. The first concerns the relation between the real wage and the rate of accumulation derived by Vianello (equation (4) above). As suggested above, the question of whether actual utilization is at its normal level when normal prices prevail is crucial to the interpretation of equation (4). Vianello interprets this equation as depicting a systematic (inverse) relation between the rate of accumulation and the real wage (and hence normal prices and the normal rate of profit). As outlined above (Section II) the basis for this interpretation is the claim that positions where normal prices prevail coincide with those where capacity is at its desired level in relation to demand; and that this desired relation between demand and productive capacity is reflected in capacity utilization being at the normal level. As such a comparison of FAS reveals a given degree of capacity utilization, at the "normal" level; in turn, with given output per worker ratios, the rate of accumulation is put in a definite relation to normal distribution — specifically, the exogenously determined real wage.

But it has been argued above that, on the basis of Ciccone's interpretation of the utilization implicit in normal prices, even if normal prices prevail simultaneously with the full adjustment of capacity, the prevailing degree of capacity utilization need not be at the normal level. That is, if full adjustment of capacity is taken to mean $K_a = K^*$ — viz., where actual capacity is appropriate to the expected pattern of demand — the actual degree of capacity utilization can differ from normal, as defined by Ciccone, because the average realised level of demand can differ from the expected average level of demand which figures in the calculation of normal capacity utilization. As suggested above, this possibility arises precisely because of the long-term horizon used by producers to arrive at those expectations; and that the same productive capacity could conceivably be appropriate for a number of different cyclical patterns of demand and hence a number of different long-term average demand levels.[22] This possibility implies that

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[21] Cf. R. Ciccone, "Accumulation and Capacity Utilization", op. cit., pp. 26-28.

[22] In fact, the irregularities associated with the actual cyclical pattern of demand provide

a comparison of two situations where capacity is fully-adjusted and prices are at their normal levels; and where normal utilization is the same, need not reveal the same actual degree of capacity utilization (since Y_a can differ from Y_e even though $K_a = K^*$). According to equation (2), then, provided the distribution of the capital stock between industries is the same in the two situations, a different actual utilization in the capital goods sector would imply a different rate of acccumulation in the two situations, even though the real wage is the same.

This possibility therefore appears to call into question the existence of a systematic relation, so far as comparisons of FAS go, between the real wage and the rate of accumulation, at least along the lines suggested by Vianello.

A second important implication of the analysis above is the possibility of a divergence between the actual or realised ratio of profits to capital and the normal rate of profit in situations where normal prices prevail. If it is possible for normal prices to prevail simultaneously with a divergence between actual and normal degrees of capacity utilization, then at those profit shares — determined by normal prices, given the wage rate and output per worker — for those sectors where there exists such a divergence the actual ratio of profits to capital will differ from the normal rate of profit (calculated on the basis of normal utilization rates); precisely because actual and normal utilization rates differ.

The third implication is this: the lack of both a systematic relation between the rate of accumulation and the normal rate of profit and equality between the latter and the realised ratio of profits to capital does not preclude the possibility of a *less systematic* relation between both the rate of accumulation and the realised profit ratio and the normal rate of profit. It was argued above that the more sluggish is Y_e to changes in the actual pattern of demand, the smaller the effect, ceteris paribus, on Y_a of the process of adjusting capacity to its desired level. Thus it may be argued that the long-term nature of Y_e is a factor that could limit the divergence between actual and normal capacity utilization. This would go some way towards answering a question posed by Committeri in response to Ciccone's analysis: "there remains the question of whether we can ever hope to observe an (even approximate) correspondence between the rate of profit realised on average and its normal level which... refers to the "normal" degree of capacity utilization. This is tantamount to asking whether there are forces keeping the average actual utilization rate in line with its normal level...

an added reason why the actual average and the expected average levels of demand can diverge even over considerably long periods of time. The question of the extent to which producers refer to such irregularities in the formation of their expectations about demand has been a subject of debate in the literature discussed here (cf. H. D. Kurz, "Normal Positions", *op. cit.*, pp. 52-54, and R. Ciccone's response "Accumulation, Capacity Utilization and Distribution", *op. cit.*, pp. 97-103).

We would like to suggest that while actual average rates may diverge from their normal levels, these deviations will be contained within certain bounds which may vary according to prevailing conditions".[23] The discussion above suggests in this regard that, although the equality of actual and normal utilization may not be implied by the adjustment of prices to normal levels, the long-term nature of expectations which figure in the calculation of normal capacity utilization (and thus normal prices) goes some way towards explaining how the actual ratio of profits to capital may be kept in correspondence with the normal rate of profit; even though positions where normal prices and distribution prevail do not imply equality in each sector between the normal rate of profit and the actual ratio of profits to capital.

Moreover, it is reasonable to suspect a similar limit on the extent to which the actual rate of accumulation diverges from the rate which would prevail where actual and normal capacity utilization coincide; just as the actual ratio of profits to capital realised on average will remain within certain limits with respect to the normal rate of profit. Thus the rate of accumulation observed over time may well bear some relation to positions characterised by normal prices and the full-adjustment of capacity, rather than the precise systematic relation suggested by Vianello's analysis. More importantly, in this view the analysis of positions characterised by normal prices and the full-adjustment of capacity to demand does not preclude a role for variations in actual capacity utilization in adjusting output to demand over the long-run, even where that analysis refers to comparisons of such positions.[24]

VII. NORMAL PRICES AND THE FULL-ADJUSTMENT OF CAPACITY TO DEMAND

Although actual and normal utilization may differ where normal prices prevail it is necessary to ask whether normal prices nevertheless require

[23] M. COMMITTERI, "Some Comments", op. cit., p. 180.

[24] The role for variations in capacity utilization in the long-run equilibration of output is the basis of the difference between the views of Ciccone and Vianello on the relation between the rate of accumulation and the rate of profit in the long-run. Vianello's concentration on FAS and his denial of any persistent role for the utilization of capacity in the adjustment of saving to investment in the long-run means that the rate of accumulation is systematically related to the normal rate of profit. But for Vianello the causation must run from normal distribution to accumulation: given the real wage or the rate of profit, the other along with normal prices is determined and the rate of accumulation must fall into line, given output per worker and capacity utilization. For Ciccone on the other hand, a systematic relation holds, not between the rate of accumulation and the normal rate of profit — the former can move independently of the real wage and hance the normal rate of profit — but rather between the rate of accumulation and the realised ratio of profits to capital; movements in the latter — by means of variation in capacity utilization — generating the necessary amount of saving per unit of capital independently of the normal rate of profit. Though the role for long-run variations in capacity utilization suggested above is in accord with Ciccone's analysis, the present argument is different to that of Ciccone's. Ciccone's position is that this role becomes clear once it is recognised that FAS may take long periods of time to restore. The view expressed above however is that even comparing FAS there may be variations in capacity utilization.

that capacity be fully adjusted in each sector; viz., that productive capacity is at its desired level in relation to long-run expectations about demand.[25] It has been suggested above, in contrast to Ciccone, that the adjustment of capacity to a desired level need not be frustrated for long periods of time; and that this assertion does not serve as a solid basis for denying a link between positions where normal prices and distribution prevail and the full-adjustment of capacity.

Nonetheless, there remains the question of why positions where normal prices prevail should also be positions where capacity is fully-adjusted. The present section approaches this question *via* a discussion of the likely effects of the process of adjusting capacity to its desired level on the configuration of normal prices. If it can be shown that the former process leads to changes in that configuration, it may then be possible to argue that normal prices (understood as a centre of gravity for actual prices) can only prevail where capacity has adjusted to its desired level in each sector.

An exhaustive treatment of the effects of adjusting capacity on normal prices is beyond the scope of this paper; however some tentative suggestions about the likely mechanisms involved can be made. In doing so it is useful to relate normal prices explicitly to normal utilization rates between sectors. Returning to Vianello's two-sector model, the Sraffian production price equations for the two sectors (which Vianello himself uses) are,

$$p_i = w_m . l_i + k_{ii} . p_i . r \dots\dots (6)$$

$$p_c = w_m . l_c + k_{ic} . p_i . r \dots\dots (7),$$

where p_i and p_c represent the unit price of the fixed-capital good and wage-good respectively; l_i and l_c the reciprocals of output per worker ratios for the capital and wage-good sectors respectively; and w_m and r the money wage rate and the normal rate of profit respectively. Production is undertaken with only labour and fixed capital — which is assumed to last indefinitely — and profit is reckoned only on the value of the amount of fixed capital in place in each sector. The coefficients k_{ii} and k_{ic} represent the ratios of the stock of fixed capital to output for the capital and wage-good sectors respectively. Taking the price of corn as the numeraire and thus $p_c = 1$ (which with a given w_m implies a given real wage w) yields:

$$p_i = w . l_i + k_{ii} . p_i . r \dots\dots (6a)$$

$$1 = w . l_c + k_{ic} . p_i . r \dots\dots (7a)$$

and solving for p_i and thus the price of iron relative to corn in turn gives

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[25] Since, in Ciccone's analysis, a divergence between actual and expected utilization (defined as averages) need not infer that capacity is excessive or deficient with respect to the long-run pattern of demand (section IV).

$$p_i = [w.(l_i.k_{ic} - l_c.k_{ii}) + k_{ii}] / k_{ic} \quad........ (8).$$

Rearringing equation (8) yields

$$p_i = [w.l_i.k_{ic} + k_{ii}.(1 - w.l_c)] / k_{ic}$$

and thus,

$$p_i = w.[l_i - l_c.(k_{ii}/k_{ic})] + (k_{ii}/k_{ic}) \quad........ (9).$$

or

$$p_i = w.l_i + (k_{ii}/k_{ic}).(1 - w.l_c) \quad........ (9a).$$

In Ciccone's analysis the relevant ratio of fixed capital to output for the calculation of normal prices is the ratio of newly installed capital to the average output planned for that capital. Following the discussion above, this ratio is it turn assumed to be equal to the reciprocal of the ratios of expected average output to the capital stock considered appropriate to expected output in each sector, viz., Y_e/K^*. As also noted above, this ratio can be taken as an index of the degree of capacity utilization implicit in normal prices, assuming the relation between the capital stock and output capacity is given. That is,

$$k = K^* / Y_e = (K^* / Y^F) . (Y^F / Y_e),$$

where Y^F represents output capacity associated with capital stock K^*, and thus (K^*/Y^F) represents the minimum fixed capital requirement per unit of output. (Y^F/Y_e) is the inverse of the ratio of output to output capacity, and thus of capacity utilization (defined as the ratio of output to output capacity). With a given K^*/Y^F, Y_e/K^* ($= u_n$ above) is therefore an index of the degree of capacity utilization implicit in normal prices. Substituting K^*/Y_e for k in equation (9a) gives

$$p_i = w.l_i + [(K^*/Y_e)_i \quad / \quad (K^*/Y_e)_c].(1 - w.l_c) \quad........ (10).$$

Equation (10) implies that with the relative price ratio equal to p_i the rate of profit — defined here as profit per unit of newly installed capital associated with the planned utilization of new capacity (assumed to be equal to utilization planned for a fully-adjusted capital stock) at the rate $Y_e/Y^F = (Y_e/K^*) . (K^*/Y^F)$ — would be equal for the two sectors.[26] With

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[26] That is, with the relative price ratio equal to p_i, the ratio

$$[(p - w_m).Ye]/p_i.K^*$$

is equal for the two sectors. It is important to note that if the rate of profit is defined as a discounted flow of profit expressed as an internal rate of return on the value of gross investment, then the present analysis assumes that the expectation horizon is the same for both sectors,

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a given wage and given output per worker ratios, equation (10) also implies that the configuration of relative prices that can be defined as normal is determined by the relation between ratios of desired capital to expected output between sectors. Hence if Y_e/K^* is affected differently between sectors by attempts to adjust capacity in line with its desired level, the pattern of normal relative prices will be affected.

Two cases are worth considering in this regard. The first, discussed above, is the case where attempts to change capacity affect Y_a but the adjustment of K_a to K^* is sufficiently fast to leave unchanged the pattern of demand that producers consider as normal. Both Y_e and K^* will then be unchanged (since both are determined on the basis of this expected pattern of demand) and thus normal utilization remains unchanged. If this is the case for all sectors, then according to equation (10) normal prices would remain unchanged.

A second and more complicated case is where the effects on realised demand of attempts to adjust capacity involve sufficient time to affect the pattern of demand that producers regard as normal and thus Y_e. In this case, K^* may or may not change in the same proportion as Y_e, since Y_e is an average and thus could be consistent with different patterns of demand, and since it is the pattern — particularly the expected peak levels of demand — as much as the average which determine the size of the deired capital stock K^*. If K^* changes in a different proportion to Y_e, then normal utilization must change; and if the effect on normal utilization is different for different industries, then the ratio of normal capacity utilization rates will change between sectors. Normal prices will therefore change. In other words, the position around which actual prices are supposedly gravitating will be affected — as will the value of the normal rate of profit — by the aggregate process of adjusting capacity to its desired level. In what manner normal utilization rates and thus normal prices are affected will depend on the way in which the pattern of demand between industries is affected by such an adjustment process as well as on the way in which the desired capital stocks change in line with changes in long-term expectations about demand.

At the very least this second case makes it clear that the attainment of a position characterised by normal prices and distribution may be open to influence by the process of capital stock adjustment, since normal prices are determined on the basis of expectations about demand, and the capital stock adjustment process by its very nature will involve changes in demand,

and that the pattern of demand fluctuations through time is the same in each sector. Only then would equality of rates of profit expressed as the ratio of profits to value of capital imply equality between internal rates of return; and only then would the relative price ratio p_i entail equality of internal rates of return. Even in the simpler case where the discounted flow of profit is the discounted value of the expected average level of profit, it would be necessary to assume that the expectation horizon is of the same length in each industry.

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and thus potentially changes in these expectations. The interesting qualification to this point lies in the fact that the desired stock of fixed capital is determined by the *long-run* behaviour of demand, which is likely to cushion the effect of short-run fluctuations in demand on investment. In turn, this is likely to cushion the effect of capital stock adjustment — both in relation to differential profit rates and in relation to demand — on the long-run behaviour of demand; and thus also the effect of that adjustment on the normal degree of capacity utilization.

What the second case above also suggests is that the claim that normal prices can only prevail where productive capacity is fully-adjusted in each sector — and in particular that full-adjustment of capacity is the counterpart in the theory of output to normal prices and distribution — is worthy of further investigation, since the non-fulfilment of one may impede the fulfilment of the other. To take this issue further would require an explicit treatment of the relation between the dynamics of demand — particularly investment — and the formation of long-term expectations about demand.

VIII. CONCLUSION

An attempt has been made in this paper to highlight some significant implications of recent debate on the relation between normal positions in the recently revived Classical/Marxian approach to value and distribution and the theory of output as represented by Keynes's principle of effective demand. Specifically, discussion has focussed on the question of whether normal prices and the normal rate of profit imply a particular degree of capacity utilization; and whether situations characterised by normal prices are necessarily situations characterised by the full-adjustment of productive capacity in line with demand. It has been argued that although normal prices can be identified with utilization associated with a fully-adjusted productive capacity, whether the latter prevails simultaneously with normal prices and distribution is open to question. By making use of Ciccone's conception of normal capacity utilization, it has also been argued, in contrast to Vianello, that, although the actual ratio of profits to capital and the rate of accumulation are not linked in a precise way with positions where normal prices prevail, nevertheless the profit ratio and the rate of accumulation will likely be kept within certain limits in relation to these positions.

Moreover, the role of expectations in the determination of normal utilization is crucial to both points. The validity of Vianello's identification of situations characterised by normal prices and FAS remains an open question to the extent that the effects of capital stock adjustment on long-term expectations about demand remain unclear. To decide on this latter question it is necessary, in turn, to determine the extent to which the long-term nature of those expectations conditions the effect on demand of

attempts to adjust capacity to desired levels. Likewise, the rejection of the systematic relation, suggested by Vianello between normal prices and the rate of accumulation, is bound up with the nature of the expectations which determine normal utilization. The latter will determine the extent to which actual utilization can diverge from normal where normal prices prevail and capacity is fully-adjusted and thus the extent of the limits on the actual ratio of profits to capital and the rate of accumulation in relation to such situations. Both points suggest as an important avenue for further research an investigation of the nature of the expectations about the future pattern of demand that enter into the calculation of normal capacity utilization.

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