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Alternative Theories of Distribution

According to the Preface of Ricardo's *Principles*, the discovery of the laws which regulate distributive shares is the "principal problem in Political Economy". The purpose of this paper is to present a bird's eye view of the various theoretical attempts, since Ricardo, at solving this "principal problem". Though all attempts at classification in such a vast field are necessarily to some extent arbitrary, and subjective to the writer, in terms of broad classification, one should, I think, distinguish between four main strands of thought, some of which contain important sub-groups. The first of these is the Ricardian, or Classical Theory, the second the Marxian, the third the Neo-Classical or Marginalist Theory and the fourth the Keynesian. The inclusion of a separate "Keynesian" theory in this context may cause surprise. An attempt will be made to show however that the specifically Keynesian apparatus of thought could be applied to the problem of distribution, rather than to the problem of the general level of production; that there is evidence that in its early stages, Keynes' own thinking tended to develop in this direction—only to be diverted from it with the discovery (made some time between the publication of the *Treatise on Money* and the *General Theory*) that inflationary and deflationary tendencies could best be analysed in terms of the resulting changes in output and employment, rather than in their effects on prices.

The compression of a whole army of distinguished writers, and schools of thought, between Ricardo and Keynes (Marx aside) under the term of Neo-Classical or Marginalist Theory is harder to justify. For apart from the marginalists proper, the group would have to include such "non-marginalists" or quasi-marginalists (from the point of view of distribution theory) as the Walrasians and the neo-Walrasians,¹ as well as the imperfect competitionists, who though marginalist, do not necessarily hold with the principle of Marginal Productivity. But as I shall hope to show, there are important aspects which all these theories have in common,² and which justifies bringing them under one broad umbrella.

Ricardo prefaced his statement by a reference to the historical fact that "in different stages of society the proportions of the whole produce of the earth which will be allotted to each of these (three) classes under the names of rent, profit and wages will be essentially different."³ To-day, a writer on the problem of distribution, would almost be inclined to say the opposite—that "in different stages of (capitalist) society the proportions of the national income allotted to wages, profits, etc., are *essentially similar*". The famous "historical constancy" of the share of wages in the national income—and the similarity of these shares in different capitalist economies, such as the U.S. and the U.K.—was of course an unsuspected feature of capitalism in Ricardo's day. But to the extent that recent empirical research tends to contradict Ricardo's assumption about the variability of relative shares, it makes the question of what determines these shares, more, rather than less, intriguing. In fact no hypothesis as regards the forces determining distributive

¹ By the term "neo-Walrasians" I mean the American "linear programming" and "Activity analysis" schools, as well as the general equilibrium model of von Neumann (*Review of Economic Studies*, 1945-46, Vol. XIII (1)) whose technique shows certain affinities with Walras even though their basic assumptions (in particular that of the "circularity" of the production process) are quite different. From the point of view of distribution theory however, the approach only yields a solution (in the shape of an equilibrium interest rate) on the assumption of constant real wages (due to an infinitely elastic supply curve of labour); it shows therefore more affinity with the classical models than with the neo-classical theories.

² With the possible exception of the "neo-Walrasian" group referred to above.

³ Preface (my italics).

shares could be intellectually satisfying unless it succeeds in accounting for the relative stability of these shares in the advanced capitalist economies over the last 100 years or so, despite the phenomenal changes in the techniques of production, in the accumulation of capital relative to labour and in real income per head.

Ricardo's concern in the problem of distribution was not due, or not only due, to the interest in the question of distributive shares *per se*, but to the belief that the theory of distribution holds the key to an understanding of the whole mechanism of the economic system—of the forces governing the rate of progress, of the ultimate incidence of taxation, of the effects of protection, and so on. It was through “the laws which regulate distributive shares” that he was hoping to build what in present-day parlance we would call “a simple macro-economic model”.¹ In this respect, if no other, the Ricardian and the “Keynesian” theories are analogous.² With the neo-Classical or Marginalist theories, on the other hand, the problem of distribution is merely one aspect of the general pricing process; it has no particular theoretical significance apart from the importance of the question *per se*. Nor do these theories yield a “macro-economic model” of the kind that exhibits the reaction-mechanism of the system through the choice of a strictly limited number of dependent and independent variables.

I. THE RICARDIAN THEORY

Ricardo's theory was based on two separate principles which we may term the “marginal principle” and the “surplus principle” respectively. The “marginal principle” serves to explain the share of rent, and the “surplus principle” the division of the residue between wages and profits. To explain the Ricardian model, we must first divide the economy into two broad branches, agriculture and industry and then show how, on Ricardo's assumptions, the forces operating in agriculture serve to determine distribution in industry.

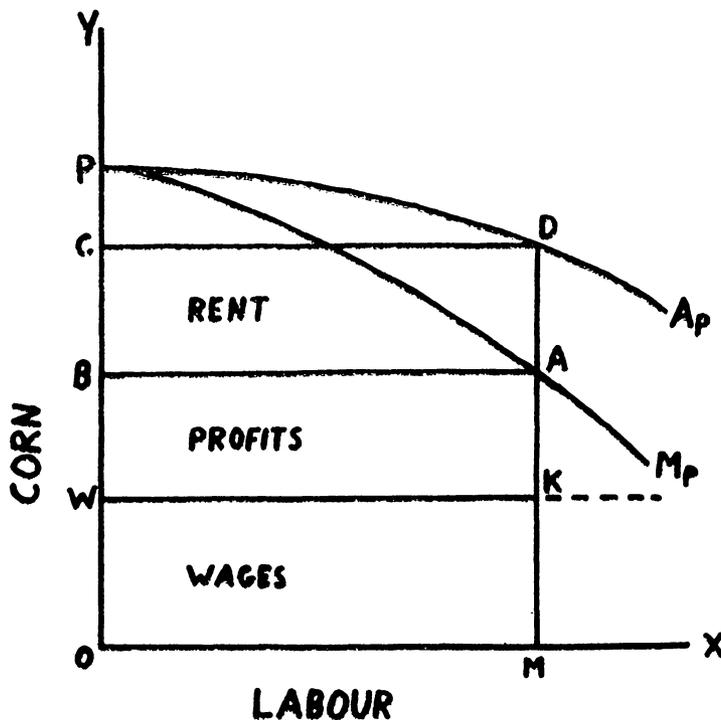
The agricultural side of the picture can be exhibited in terms of a simple diagram (FIG. 1), where Oy measures quantities of “corn” (standing for all agricultural produce) and Ox the amount of labour employed in agriculture. At a given state of knowledge and in a given natural environment the curve $p—Ap$ represents the product per unit of labour and the curve $p—Mp$ the marginal product of labour. The existence of these two *separate* curves, is a consequence of a declining tendency in the average product curve—i.e., of the assumption of diminishing returns. Corn-output is thus uniquely determined when the quantity of labour is given:³ for any given working force, OM , total output is represented by the rectangle $OCDM$. Rent is the difference between the product of labour on “marginal” land and the product on average land, or (allowing for the intensive, as well as the extensive, margin) the difference between average and marginal labour productivity which depends on the elasticity of the $p—Ap$ curve, i.e., the extent to which diminishing returns operate.

The marginal product of labour (or, in classical parlance, the “produce-minus-rent”) is not however equal to the wage, but to the sum of wages and profits. The rate of wages is determined quite independently of marginal productivity by the supply price of labour

¹ “Political Economy” he told Malthus “you think is an enquiry into the nature and causes of wealth—I think it should rather be called an enquiry into the laws which determine the division of the produce of industry amongst the classes who concur in its formation. No law can be laid down respecting quantity, but a tolerably correct one can be laid down respecting proportions. Every day I am more satisfied that the former enquiry is vain and delusive, and the latter only the true objects of the science.” (Letter dated 9 Oct., 1820, Works (Sraffa edition) vol. VIII, pp. 278-9.)

² And so of course is the Marxian: but then the Marxian theory is really only a simplified version of Ricardo, clothed in a different garb.

³ This abstracts from variations in output per head due to the use of more or less fixed capital relative to labour—otherwise the curves could not be uniquely drawn, relative to a given state of technical knowledge. As between fixed capital and labour therefore the model assumes “fixed coefficients”; as between labour and land, variable coefficients.



which Ricardo assumed to be constant in terms of corn. In modern parlance, the Ricardian hypothesis implies an infinitely elastic supply curve of labour at the given supply price, OW .¹ The demand for labour is not determined however by the $p-Mp$ curve, but by the accumulation of capital which determines how many labourers can find employment at the wage rate OW . Hence the equilibrium position is not indicated by the point of intersection between the $p-Mp$ curve and the supply curve of labour, but by the aggregate demand for labour in terms of corn—the “wages fund”.² As capital accumulates, the

¹ The basis of this assumption is the Malthusian theory of population, according to which numbers will increase (indefinitely) when wages are above, and decrease (indefinitely) when they are below, the “subsistence level”. In Ricardo’s hands this doctrine had lost its sharp focus on a biologically determined quantum of subsistence to which the supply price of labour must be tied; he emphasized that habits of restraint engendered in a civilized environment can permanently secure for labour higher standards of living than the bare minimum for survival. Yet he retained the important operative principle that in any given social and cultural environment there is a “natural rate of wages” at which alone population could remain stationary and from which wages can only deviate temporarily. The hypothesis of an infinitely elastic supply curve of labour thus did not necessarily imply that this supply price must be equal to the bare minimum of subsistence. Yet this assumption was inconsistent with another (implied) feature of his model discussed below, that wages are not only fixed in terms of “corn” but are entirely (or almost entirely) spent on corn.

² Total wages depend on—and are “paid out of”—capital simply because production takes time, and the labourers (unlike the landlords) not being in the position to afford to wait, have their wages “advanced” to them by the capitalists. This is true of fixed as well as circulating capital, but since with the former, the turnover period is relatively long, only a small part of annual wages is paid out of fixed capital; the amount of circulating capital was therefore treated as the proper “wages fund”. Despite his analysis of the effect of changes in wages on the amount of fixed capital used relative to labour, i.e., on the proportions of fixed and circulating capital employed in production (Professor Hayek’s celebrated “Ricardo effect”) for the purpose of his distribution theory this ratio should be taken as given, irrespective of the rate of profit.

labour force will grow, so that any addition to the total wage fund, through capital accumulation—the *agricultural* wages fund is indicated by the area *OWKM*—will tend to be a horizontal addition (pushing the vertical line *KM* to the right) and not a vertical one (pushing the horizontal line *WK* upwards).¹

For any given *M*, profits are thus a residue, arising from the difference between the marginal product of labour and the rate of wages. The resulting ratio, $\frac{\text{Profits}}{\text{Wages}}$, determines the rate of profit per cent on the capital employed; it is moreover *equal* to that ratio, on the assumption that the capital is turned over once a year, so that the capital employed is equal to the annual wages-bill. (This latter proposition however is merely a simplification, and not an essential part of the story).

In a state of equilibrium, the money rate of profit *per cent* earned on capital must be the same in industry and in agriculture, otherwise capital would move from one form of employment to the other. But it is the peculiarity of agriculture that the money rate of profit in that industry cannot diverge from the rate of profit measured in terms of that industry's own product, *i.e.*, the corn-rate of profit. This is because in agriculture both the input (the wage outlay) and the output consist of the same commodity, "corn". In manufacturing industry on the other hand, input and output consist of heterogeneous commodities—the cost per man is fixed in corn, while the product per man, in a given state of technical knowledge, is fixed in terms of manufactured goods. Hence the only way equality in the rate of profit in money terms can be attained as between the two branches is through the prices of industrial goods becoming dearer or cheaper in terms of agricultural products. The money rate of profit in manufacturing industry therefore depends on the corn-rate of profit in agriculture,² the latter on the other hand, is entirely a matter of the margin of cultivation, which in turn is a reflection (in a closed economy and in a given state of technical knowledge) of the extent of capital accumulation. Thus "diminishing fertility of the soil," as James Mill put it, "is the great and ultimately only necessary cause of a fall in profit".

To make the whole structure logically consistent it is necessary to suppose, not only that wages are fixed in terms of "corn" but that they are entirely spent on "corn", for otherwise any change in the relation between industrial and agricultural prices will alter real wages (in terms of commodities in general) so that the size of the "surplus", and the rate of profit on capital generally, is no longer derivable from the "corn rate of profit"—the relationship between the product of labour and the cost of labour working on marginal land. Assuming that ("corn") agricultural products are wage-goods and manufactured products are non-wage goods (*i.e.*, ignoring that *some* agricultural products are consumed by capitalists, and *some* non-agricultural products by wage-earners), the whole corn-output (the area *OCDM* in the diagram) can be taken as the annual wages fund, of which *OWKM* is employed in agriculture and *WCDK* in the rest of the economy. Any increase in *OWKM* (caused, *e.g.*, by protection to agriculture) must necessarily lower the rate of profit (which is the source

¹ The feature which the modern mind may find most difficult to swallow is not that capital accumulation should lead to a rise in population but that the reaction should be taken as something so swift as to ignore the intervening stage, where the increase in the wages fund should raise the rate of wages rather than the numbers employed. The adjustment of population to changes in the demand for labour would normally be treated as a slow long-run effect whereas changes in the demand for labour (caused by capital accumulation) may be swift or sudden. Ricardo however conceived the economy as one which proceeds at a more or less steady rate of growth in time, with the accumulation of capital going on at a (more or less constant) rate; while he conceded that *changes* in the rate of capital accumulation will temporarily raise or lower wages, he assumed that the rate of population growth itself is adapted to a certain rate of capital accumulation which had been going on for some time.

² The analytical basis for this conclusion, given above, was never, as Sraffa remarks, stated by Ricardo in any of his extant letters and papers though there is evidence from Malthus's remarks that he must have formulated it either in a lost paper on the Profits of Capital or in conversation (*cf. Works*, Vol I., Introduction, p. xxxi.).

of all accumulation) and thus slow down the rate of growth.¹ Similarly all taxes, other than those levied on land, must ultimately fall on, and be paid out of, profits, and thus slow down the rate of accumulation. Taxation and agricultural protection thus tend to accelerate the tendency (which is in any case inevitable—unless *continued* technical progress manages to shift the $p—Ap$ and $p—Mp$ curves to the right sufficiently to suspend altogether the operation of the Law of Diminishing Returns) to that ultimate state of gloom, the Stationary State, where accumulation ceases simply because “profits are so low as not to afford (the capitalists more than) an adequate compensation for their trouble and the risk which they must necessarily encounter in employing their capital productively”.²

II THE MARXIAN THEORY

The Marxian theory is essentially an adaptation of Ricardo’s “surplus theory”. The main analytical differences are :— (1) that Marx paid no attention to (and did not believe in) the Law of Diminishing Returns, and hence made no analytical distinction between rent and profits ; (2) that Marx regarded the supply price of labour (the “cost of reproduction” of labour) as being fixed, not in terms of “corn”, but of commodities in general. Hence he regarded the share of profits (including rent) in output as determined simply by the surplus of the product per unit of labour over the supply price (or cost) of labour—or the surplus of production to the consumption necessary for production.³

There are important differences also as between Marx and Ricardo in two other respects. The first of these concerns the reasons for wages being tied to the subsistence level. In Marx’s theory this is ensured through the fact that at any one time the supply of labour—the number of workers seeking wage-employment—tends to exceed the demand for labour. The existence of an unemployed fringe—the “reserve army” of labour—prevents wages from rising above the minimum that must be paid to enable the labourers to perform the work. Marx assumed that as capitalist enterprise progresses at the expenses of pre-capitalistic enterprise more labourers are released through the disappearance of the non-capitalist or handi-craft units than are absorbed in the capitalist sector, owing to the difference in productivity per head between the two sectors. As long as the growth of capitalist enterprise is at the cost of a shrinkage of pre-capitalist enterprise the increase in the supply of wage labour will thus tend to run ahead of the increase in the demand for wage labour.

Sooner or later, however, the demand for labour resulting from accumulation by capitalist enterprise will run ahead of the increase in supply ; at that stage labour becomes scarce, wages rise, profits are wiped out and capitalism is faced with a “crisis”. (The crisis in itself slows down the rate of accumulation and reduces the demand for labour at any given state of accumulation by increasing the “organic composition of capital,” so that the “reserve army” will sooner or later be recreated.)

The second important difference relates to the motives behind capital accumulation. For Ricardo this was simply to be explained by the lure of a high rate of profit. Capitalists accumulate voluntarily so long as the rate of profit exceeds the minimum “necessary compensation” for the risks and trouble encountered in the productive employment of capital. For Marx however, accumulation by capitalist enterprise is not a matter of choice

¹ The evil of agricultural protection is thus not only that real income is reduced through the transfer of labour to less productive employments, but that owing to the reduction in the rate of profit, industrial prices fall in terms of agricultural prices ; income is thus transferred from the classes which use their wealth productively to classes which use it unproductively.

² Ricardo, *Principles*, p. 122 (Sraffa Edition).

³ Ricardo himself abandoned in the *Principles* the idea that wages consist of corn (to the exclusion of manufactures) but whether he also abandoned the idea that the agricultural surplus is critical to the whole distribution process through the fixity of wages in terms of *corn only* is not clear. (Cf. Sraffa, *op. cit.*, pp. xxxii-xxxiii.)

but a necessity, due to competition among the capitalists themselves. This in turn was explained by the existence of economies of large scale production (together with the implicit assumption that the amount of capital employed by any particular capitalist is governed by his own accumulation). Given the fact that the larger the scale of operations the more efficient the business, each capitalist is forced to increase the size of his business through the re-investment of his profits if he is not to fall behind in the competitive struggle.

It is only at a later stage, when the increasing concentration of production in the hands of the more successful enterprises removed the competitive necessity for accumulation—the stage of “monopoly capitalism”—that in the Marxian scheme there is room for economic crises, not on account of an excessive increase in the demand for labour following on accumulation but on account of an insufficiency of effective demand—the failure of markets resulting from the inability of the capitalists either to spend or to invest the full amount of profits (which Marx called the problem of “realising surplus value”).

Marx has also taken over from Ricardo, and the classical economists generally, the idea of a falling rate of profit with the progressive accumulation of capital. But whereas with the classicists this was firmly grounded on the Law of Diminishing Returns, Marx, having discarded that law, had no firm base for it. His own explanation is based on the assumed increase in the ratio of fixed to circulating capital (in Marxian terminology, “constant” to “variable” capital) with the progress of capitalism; but as several authors have pointed out,¹ the law of the falling rate of profit cannot really be derived from the law of the “increasing organic composition” of capital. Since Marx assumes that the supply price of labour remains unchanged in terms of commodities when the organic composition of capital, and hence output per head, rises, there is no more reason to assume that an increase in “organic composition” will yield a lower rate of profit than a higher rate. For even if output per man were assumed to increase more slowly than (“constant” plus “variable”) capital per man, the “surplus value” per man (the excess of output per man over the costs of reproduction of labour) will necessarily increase faster than output per man, and may thus secure a rising rate of profit even if there is diminishing productivity to successive additions to fixed capital per unit of labour.

While some of Marx's predictions—such as the increasing concentration of production in the hands of large enterprises—proved accurate, his most important thesis, the steady worsening of the living conditions of the working classes—“the immiseration of the proletariat”²—has been contradicted by experience, in both the “competitive” and “monopoly” stages of capitalism. On the Marxian model the share of wages in output must necessarily fall with every increase in output per head. The theory can only allow for a rise of wages in terms of commodities as a result of the collective organisation of the working classes which forces the capitalists to reduce the degree of exploitation and to surrender to the workers some of the “surplus value”.³ This hypothesis however will only yield a constant share of wages on the extremely far-fetched assumption that the rate of increase in the bargaining strength of labour, due to the growth of collective organisation, precisely keeps pace with the rate of increase in output per head.

¹ Cf. in particular, Joan Robinson, *An Essay in Marxian Economics*, pp. 75-82.

² It is not clear, in terms of Marx's own theoretical model, why such a progressive immiseration should take place—since the costs of reproduction of labour appear to set an *absolute* limit to the extent to which labour can be exploited. Some parts of *Das Kapital* could however be construed as suggesting that wages can be driven below the (long run) reproduction cost of labour, at the cost of a (long run) shrinkage in the labour force: and with the increasing organic composition of capital, and the rise of monopolies, the demand for labour may show an equally declining tendency.

³ Marx himself would have conceived a reduction in the “degree of exploitation” in terms of a reduction in the length of the working day rather than a rise in real wages per day. In fact both have occurred side by side.

III THE NEO-CLASSICAL THEORIES

(A) MARGINAL PRODUCTIVITY

While Marx's theory thus derives from Ricardo's surplus principle, neo-classical value and distribution theory derives from another part of the Ricardian model: the "marginal principle" introduced for the explanation of rent (which explains why both Marx and Marshall are able to claim Ricardo as their precursor). The difference between Ricardo and the neo-classics is (1) that whereas Ricardo employed the "principle of substitution" (or rather, the principle of "limited substitutability"—which is the basic assumption underlying all "marginal" analysis) only as regards the use of labour relative to land, in neo-classical theory this doctrine was formalized and generalized, and assumed to hold true of any factor, in relation to any other;¹ (2) whereas Ricardo employed the principle for showing that a "fixed" factor will earn a surplus, determined by the gap between the average and marginal product of the variable factor, neo-classical theory concentrated on the reverse aspect—i.e., that any factor variable in supply will obtain a remuneration which, under competitive conditions, must correspond to its marginal product. Thus if the total supply of *all* factors (and not only land) is being taken as given, independently of price, and all are assumed to be limited substitutes to one another, the share-out of the whole produce can be regarded as being determined by the marginal rates of substitution between them. Thus in terms of our diagram, if we assumed that along *Ox* we measure the quantity of any particular factor of production, *x*, the quantities of all the others being taken as fixed, *p—Mp* will exhibit the marginal productivity function of the variable factor. If the actual employment of that factor is taken to be *M*, *AM* will represent its demand price per unit, and the rectangle *OBAM* its share in the total produce. Since this principle could be applied to any factor, it must be true of all (including, as Walras and Wicksell have shown, the factors owned by the entrepreneur himself) hence the rectangle *BCDA* must be sufficient, and only just sufficient, for remunerating all other factors but *x* on the basis of their respective marginal productivities. This, as Wicksteed has shown² requires the assumption that the production function will be homogeneous of the first degree for all variables taken together—an assumption which he himself regarded as little more than a tautology, if "factors of production" are appropriately defined.³ From the point of view of the theory, however, the *appropriate* definition of factors involves the elimination of intermediate products and their conversion into "ultimate" or "original" factors, since only on this definition can one assume the properties of divisibility and variability of coefficients. When factors are thus defined, the assumption of constant

¹ As well as of any particular commodity in the sphere of consumption. The utility theory of value is really Ricardian rent-theory applied to consumption demand. In fact, as Walras has shown, limited substitutability in consumption might in itself be sufficient to determine distributive shares, provided that the proportions in which the different factors are used are different in different industries. His solution of the problem of distribution, based on "fixed coefficients" of production (intended only as a first approximation) is subject however to various snags since the solution of his equations may yield negative prices for the factors as well as positive ones and it cannot be determined beforehand whether this will be the case or not. If the solution of the equations yields negative prices the factors in question have to be excluded as "free goods"; and the operation (if necessary) successive repeated until only factors with positive prices are left. Also, it is necessary to suppose that the number of different "factors" is no greater than the number of different "products" otherwise the solution is indeterminate.

² *The Co-ordination of the Laws of Distribution* (1894).

³ *Ibid.*, p. 53 "We must regard every kind and quality of labour that can be distinguished from other kinds and qualities as a separate factor; and in the same way, every kind of land will be taken as a separate factor. Still more important is it to insist that instead of speaking of so many £ worth of capital we shall speak of so many ploughs, so many tons of manure, and so many horses or footpounds of power. Each of these may be scheduled in its own unit." Under these conditions it is true to say that "doubling all factors will double the product", but since these "factors" are indivisible in varying degrees, it does not mean that the production function is a linear and homogeneous one in relation to incremental variations of output. Also a change in output may be associated with the introduction of *new* factors of production.

returns to scale is by no means a tautology ; it is a restrictive assumption, which may be regarded, however, as being co-extensive with other restrictive assumptions implied by the theory—i.e., the universal rule of perfect competition, and the absence of external economies and diseconomies.

The basic difficulty with the whole approach does not lie, however, in this so-called “adding-up problem” but in the very meaning of “capital” as a factor of production.¹ Whilst land can be measured in acres-per-year and labour in man-hours, capital (as distinct from “capital goods”) cannot be measured in terms of physical units.² To evaluate the marginal product of labour it is necessary to isolate two situations containing identical “capital” but two different quantities of labour, or identical amounts of labour and two differing quantities of “capital”, in precise numerical relationship.³

Marshall, without going into the matter in any detail, had shown in several passages that he was dimly aware of this ; and in carefully re-defining marginal productivity so as to mean “marginal *net* productivity” (*net* after deduction of all associated expenses on other “factors”) he shied away from the task of putting forward a general theory of distribution altogether.⁴

In fact, in so far as we can speak of a “Marshallian” theory of distribution at all, it is in the sense of a “short period” theory, which regards profits as the “quasi-rents” earned on the use of capital goods of various kinds, the supply of which can be treated as given for the time being, as a heritage of the past. The doctrine of the “quasi-rent” assimilates capital as a factor of production to Ricardian land : the separate *kinds* of capital goods being treated as so many different kinds of “land”. Here the problem of the measurement of capital as a factor of production does not arise : since, strictly speaking, no kind of change or reorganization in the stock of intermediate products is permitted in connection with a change in the level or composition of production. It was this aspect of Marshall which, consciously or sub-consciously, provided the “model” for most of the post-Marshallian Cambridge theorizing. Prices are equal to, or determined by, marginal prime costs ; profits are determined by the difference between marginal and average prime costs ; prime costs, for the system as a whole, are labour costs (since raw-material costs, for a closed economy at any rate, disappear if all branches of industry are taken together) ; ultimately therefore the division of output between profits and wages is a matter depending on the existence of diminishing returns to labour, as more labour is used in conjunction with a *given* capital equipment ; and is determined by the elasticity of labour’s average productivity curve which fixes the share of quasi-rents.

Marshall himself would have disagreed with the use of the quasi-rent doctrine as a distribution theory, holding that distributive shares in the short period are determined by long-period forces.⁵ Clearly even if one were to hold strictly to the assumption that “profit margins” are the outcome of short-period profit-maximisation, this “short-

¹ For a general equilibrium system, capital goods cannot be regarded as factors of production *per se* (in the manner suggested by Wicksteed) otherwise the same things are simultaneously treated as the parameters and the unknowns of the system.

² Measurement in terms of value (as so many £’s of “capital”) already assumes a certain rate of interest, on the basis of which services accruing in differing periods in the future, or costs incurred at differing dates in the past, are brought to a measure of equivalence.

³ The product of the “marginal shepherd” is the difference, in terms of numbers of sheep, between 10 shepherds using 10 crooks and 11 shepherds using 11 slightly inferior crooks, the term “slightly inferior” being taken to mean that the 11 crooks in the one case represent precisely the same amount of “capital” as the 10 crooks in the other case. (Cf. also, Robertson, “Wage Grumbles,” in *Economic Fragments*, 1931.)

⁴ “The doctrine that the earnings of a worker tend to be equal to the net product of his work, has by itself no real meaning ; since in order to estimate the net product, we have to take for granted all the expenses of production of the commodity on which he works, other than his own wages”. Similarly, the doctrine that the marginal efficiency of capital will tend to equal the rate of interest “cannot be made into a theory of interest, any more than a theory of wages, without reasoning in a circle”. (Cf. *Principles*, 8th edition, Book VI, ch. I, paras 7-8.)

⁵ Cf., in particular, *Principles*, 8th edition, Book V, ch. V, and 6, and Book VI, ch. VIII, paras. 4.

period" approach does not really get us anywhere : for the extent to which diminishing returns operate for labour in conjunction with the capital equipment available to-day is itself a function of the price-relationships which have ruled in the past because these have determined the quantities of each of the kinds of equipment available. The theory does not therefore really amount to more than saying that the prices of to-day are derived from the prices of yesterday—a proposition which is the more true and the more trivial the shorter the "day" is conceived to be, in terms of chronological time.

For the true neo-classical attempt to solve the general problem of distribution we must go to Wicksell who thought that by integrating the Austrian approach to capital with Walrasian equilibrium theory he could provide a general solution, treating capital as a two-dimensional quantity, the product of time and labour. The "time" in this case is the investment period or waiting period separating the application of "original" factors from the emergence of the final product, and the marginal productivity of capital the added product resulting from an extension of "time". This attempt, again, came to grief (as Wicksell himself came near to acknowledging late in life¹) (i) owing to the impossibility of measuring that period in terms of an "average" of some kind ;² (ii) owing to the impossibility of combining the investment periods of different "original" factors in a single measure.³

In fact the whole approach which regards the share of wages and of profits in output as being determined by the marginal rate of substitution between Capital and Labour—with its corollary, that the constancy of relative shares is evidence of a unity-Elasticity of Substitution between Capital and Labour⁴—is hardly acceptable to present-day economists. Its inadequacy becomes evident as soon as it is realized that the "marginal rate of substitution" between Capital and Labour—as distinct from the marginal rate of substitution between labour and land—can only be determined once the rate of profit and the rate of wages are already known. The same technical alternatives might yield very different "marginal rates of substitution" according as the ratio of profits to wages is one thing or another. The theory asserts in effect, that the rate of interest in the capital market, (and the associated wage rate in the labour market) is determined by the condition that at any lower interest rate (and higher wage rate) capital would be invested in such "labour-saving" forms as would provide insufficient employment to the available labour ; whilst at any higher rate, capital would be invested in forms that offered more places of employment than could be filled with the available labour.

Quite apart from all conceptual difficulties, the theory focuses attention on a relatively unimportant feature of a growing economy. For accumulation does not take the form of "deepening" the structure of capital (at a given state of knowledge) but rather in keeping pace with technical progress and the growth in the labour force. It is difficult to swallow a theory which says, in effect that wages and profits are what they are for otherwise there would be too much deepening or too little deepening (the capital/output ratios would be either too large or too small) to be consistent with simultaneous equilibrium in the savings-investment market and in the labour market.

¹ Cf. the concluding passage of his posthumous contribution to the Wieser Festschrift. *Die Wirtschaftstheorie der Gegenwart* (1928) Vol. III, pp. 208-9 ; also his *Analysis of Akerman's Problem*, reprinted in *Lectures*, Vol. I, p. 270.

² Since owing to compound interest, the weights to be used in the calculation of the average will themselves be dependent on the rate of interest.

³ For a more extended treatment cf. my articles on capital theory in *Econometrica*, April 1937 and May 1938 ; also Joan Robinson, *The Production Function in the Theory of Capital*, *Review of Economic Studies*, Vol. XXI (1953-54) p. 81, and *Comment* by D. G. Champenowne, *ibid* page 112.

⁴ Cf. Hicks, *The Theory of Wages* (1932) ch. VI, *passim*.

(B) THE "DEGREE OF MONOPOLY" THEORIES OF DISTRIBUTION

Monopoly profit was always regarded as a distinct form of revenue in neo-classical theory, though not one of any great quantitative importance since the mass of commodities was thought of as being produced under competitive conditions. But the modern theories of imperfect competition emphasised that monopoly profit is not an isolated feature. Profits in general contain an *element* of monopoly revenue—an element that is best defined as the excess of the actual profit margin in output over what the profit margin would have been under perfectly competitive conditions. Under Marshallian "short-period" assumptions the perfectly-competitive profit margin is given by the excess of marginal cost over average prime costs. The additional monopoly element is indicated by the excess of price over marginal cost. The former, as we have seen, is a derivative of the elasticity of labour's productivity curve where capital equipment of all kinds is treated as given. The latter is a derivative of the elasticity of demand facing the individual firm. The novel feature of imperfect competition theories is to have shown that the increase of profit margins due to this element of monopoly need not imply a corresponding excess in the rates of profit on capital over the competitive rate; through the generation of excess capacity (i.e., the tendency of demand curves to become "tangential" to the cost curves) the latter may approach a "competitive" or "normal" rate (as a result of the consequential rise in the capital/output ratio) even if the former is above the competitive level.

Kalecki¹ built on this a simplified theory of distribution, where the share of profits in output is shown to be determined by the elasticity of demand alone. This was based on the hypothesis that in the short period, labour and capital equipment are largely "limitational" and not "substitutional" factors, with the result that the short-period prime cost-curve is a reverse —L shaped one (prime costs being constant up to full capacity output). In that case marginal costs are equal to average prime costs; the ratio of price to prime costs (and hence, in a closed economy, the ratio of gross profits to wages) is thus entirely accounted for by the elasticity of the firm's demand curve.

On closer inspection, however, the elasticity of the demand curve facing the individual firm turned out to be no less of a broken reed than its counterpart, the elasticity of substitution between factors. There is no evidence that firms in imperfect markets set their prices by reference to the elasticity of their sales-function, or that short-period pricing is the outcome of any deliberate attempt to maximize profits by reference to an independent revenue and a cost function. Indeed the very notion of a demand curve for the products of a single firm is illegitimate if the prices charged by different firms cannot be assumed to be independent of each other.²

In the later versions of his theory Kalecki abandoned the link between the "degree of monopoly" and the elasticity of demand, and was content with a purely tautological approach according to which the ratio of price to prime costs is *defined* simply as the "degree of monopoly". Propositions based on implicit definitions of this kind make of course no assertion about reality and possess no explanatory value. Unless the "degree of monopoly" can be defined in terms of market relationships of some kind (as, for example, in terms of the "cross-elasticities" of demand for the products of the different firms)³ and an attempt is made to demonstrate how these market relationships determine

¹ The original version appeared in *Econometrica*, April 1938. Subsequent versions appeared in *Essays in the Theory of Economic Fluctuations* (1938) ch. 1, *Studies in Economic Dynamics* (1943) ch. 1, and *Theory of Dynamic Economics* (1954) Part 1.

² The theory of the "kinked" demand curve is in fact no more than a recognition of the fact that the demand curve of the firm (in the sense required for the purpose of deriving price from the postulate of profit maximisation) is non-existent. Since the position of the "kink" depends on the price, it cannot determine the price; it thus leaves the profit margin completely undetermined.

³ The "cross-elasticities" of demand indicate the degree of interdependence of the markets of different firms and are thus inversely related to monopoly power in the usual sense of the word.

the relation between prices and costs, the theory does not provide a hypothesis which could be affirmed or refuted.

There is no need, of course, to follow Kalecki in the attempt to lend spurious precision to the doctrine through implicit theorizing—a vice which afflicts all theories which we grouped together as “neo-classical” in varying degrees. Fundamentally, the proposition that the distribution of income between wages and profits depends on market structures, on the strength or weakness of the forces of competition, is not a tautological one; it asserts *something* about reality (which may in principle be proved false) even if that “something” cannot be given a logically precise formulation. Just as the positive content of the marginal productivity theory can be summed up by the statement that the rate of profit on capital (and the margin of profit in output) is governed by the need to prevent the capital/output ratio from being either too large or too small, the positive content of the “degree of monopoly” theory can be summed up in the sentence that “profit margins are what they are because the forces of competition prevent them from being higher than they are and are not powerful enough to make them lower than they are”. Unfortunately neither of these statements gets us very far.

Dissatisfaction with the tautological character and the formalism of the “marginal revenue-equals-marginal cost” type of price theory led to the formulation of the “full cost” theories of pricing,¹ according to which producers in imperfect markets set their prices independently of the character of demand, and solely on the basis of their long run costs of production (including the “normal” rate of profit on their own capital). If these theories asserted no more than that prices in manufacturing industry are *not* determined by the criterion of short-run profit-maximization, and that profit margins can be fairly insensitive to short-period variations in demand,² (the impact effect of changes in demand being on the rate of production, rather than on prices) they would provide a healthy antidote to a great deal of facile theorising. When, however, they go beyond this and assert that prices are determined quite independently of demand, they in effect destroy existing price theory without putting anything else in its place. Quite apart from the fact that a “full cost” theory is quite unable to explain why some firms should be more successful in earning profits than others, the level of the “normal profit” on which the full cost calculations are supposed to be based is left quite undetermined. The very fact that these full cost theories should have received such widespread and serious consideration as an alternative explanation of the pricing process is an indication of the sad state of vagueness and confusion into which the neo-classical value theory had fallen.

¹ Cf. Hall and Hitch, *Oxford Economic Papers*, 1939; P. M. S. Andrews, *Manufacturing Business* (1949).

² This, I believe, was the intention of the original Hall-Hitch article. Cf. Marshall, *Principles*, Book VI, ch. VIII, paragraph 4: “We see then that there is no general tendency of profits on the turnover to equality; but there may be, and as a matter of fact there is, in each trade and in every branch of each trade, a more or less definite rate of profits on the turnover which is regarded as a “fair” or normal rate. Of course these rates are always changing in consequence of changes in the methods of trade; which are generally begun by individuals who desire to do a larger trade at a lower rate of profit on the turnover than has been customary, but at a larger rate of profit per annum on their capital. If however there happens to be no great change of this kind going on, the traditions of the trade that a certain rate of profit on the turnover should be charged for a particular class of work are of great practical service to those in the trade. Such traditions are the outcome of much experience tending to show that, if that rate is charged, a proper allowance will be made for all the costs (supplementary as well as prime) incurred for that particular purpose, and in addition the normal rate of profits per annum in that class of business will be afforded. If they charge a price which gives much less than this rate of profit on the turnover they can hardly prosper; and if they charge much more they are in danger of losing their custom, since others can afford to undersell them. This is the “fair” rate of profit on the turnover, which an honest man is expected to charge for making goods to order, when no price has been agreed on beforehand; and it is the rate which a court of law will allow in case a dispute should arise between buyer and seller.” Cf. also Kahn, *Economic Journal*, 1952, p. 119.

IV THE KEYNESIAN THEORY

Keynes, as far as I know, was never interested in the problem of distribution as such. One may nevertheless christen a particular theory of distribution as "Keynesian" if it can be shown to be an application of the specifically Keynesian apparatus of thought and if evidence can be adduced that at some stage in the development of his ideas, Keynes came near to formulating such a theory.¹ The principle of the Multiplier (which in some way was anticipated in the *Treatise* but without a clear view of its implications) could be alternatively applied to a determination of the relation between prices and wages, if the level of output and employment is taken as given, or the determination of the level of employment, if distribution (i.e., the relation between prices and wages) is taken as given. The reason why the multiplier-analysis has not been developed as a distribution theory is precisely because it was invented for the purpose of an employment theory—to explain why an economic system can remain in equilibrium in a state of under-employment (or of a general under-utilization of resources), where the classical properties of scarcity-economics are inapplicable. And its use for the one appears to exclude its use for the other.² If we assume that the balance of savings and investment is brought about through variations in the relationship of prices and costs, we are not only bereft of a principle for explaining variations in output and employment, but the whole idea of separate "aggregate" demand and supply functions—the principle of "effective demand"—falls to the ground; we are back to Say's Law, where output as a whole is limited by available resources, and a fall in effective demand for one kind of commodity (in real terms) generates compensating increases in effective demand (again in real terms) for others. Yet these two uses of the Multiplier principle are not as incompatible as would appear at first sight: the Keynesian technique, as I hope to show, can be used for both purposes, provided the one is conceived as a short-run theory and the other as a long-run theory—or rather, the one is used in the framework of a static model, and the other in the framework of a dynamic growth model.³

¹ I am referring to the well-known passage on profits being likened to a "widow's cruse" in the *Treatise on Money*, Vol. I, p. 139. "If entrepreneurs choose to spend a portion of their profits on consumption (and there is, of course, nothing to prevent them from doing this) the effect is to *increase* the profit on the sale of liquid consumption goods by an amount exactly equal to the amount of profits which have been thus expended . . . Thus however much of their profits entrepreneurs spend on consumption, the increment of wealth belonging to entrepreneurs remain the same as before. Thus profits, as a source of capital increment for entrepreneurs, are a widow's cruse which remains undepleted however much of them may be devoted to riotous living. When on the other hand, entrepreneurs are making losses, and seek to recoup these losses by curtailing their normal expenditure on consumption, i.e., by saving more, the cruse becomes a Danaid jar which can never be filled up; for the effect of this reduced expenditure is to inflict on the producers of consumption-goods a loss of an equal amount. Thus the diminution of their wealth, as a class is as great, in spite of their savings, as it was before." This passage, I think, contains the true seed of the ideas developed in the *General Theory*—as well as showing the length of the road that had to be traversed before arriving at the conceptual framework presented in the latter work. The fact that "profits", "savings" etc. were all defined here in a special sense that was later discarded, and that the argument specifically refers to expenditure on consumption goods, rather than entrepreneurial expenditure in general, should not blind us to the fact that here Keynes regards entrepreneurial incomes as being the resultant of their expenditure decisions, rather than the other way round—which is perhaps the most important difference between "Keynesian" and "pre-Keynesian" habits of thought.

² Although this application of Keynesian theory has been implicit in several discussions of the problem of inflation. (Cf. e.g. A. J. Brown, *The Great Inflation*, Macmillan, 1955.)

³ I first thought of using the Multiplier technique for purposes of a distribution theory when I attempted the ultimate incidence of profits taxation under full employment conditions in a paper prepared for the Royal Commission on Taxation in 1951. The further development of these ideas, and particularly their relationship to a dynamic theory of growth, owes a great deal to discussions with Mrs. Robinson, whose forthcoming book, *The Accumulation of Capital*, contains a systematic exploration of this field. I should also like to mention here that I owe a great deal of stimulus to a paper by Kalecki, "A Theory of Profits" (*Economic Journal*, June-Sept. 1942) whose approach is in some ways reminiscent of the "widow's cruse" of Keynes' *Treatise* even though Kalecki uses the technique, not for an explanation of the share of profits in output, but for showing why the *level* of output and its fluctuations is peculiarly dependent on entrepreneurial behaviour. (In doing so, he uses the restrictive assumption that savings are entirely supplied out of profits.) I have also been helped by Mr. Harry Johnson and Mr. Robin Marris, both in the working out of the formulae and in general discussion.

We shall assume, to begin with, a state of full employment (we shall show later the conditions under which a state of full employment will *result* from our model) so that total output or income (Y) is given. Income may be divided into two broad categories, Wages and Profits (W and P), where the wage-category comprises not only manual labour but salaries as well, and Profits the income of property owners generally, and not only of entrepreneurs; the important difference between them being in the marginal propensities to consume (or save), wage-earners' marginal savings being small in relation to those of capitalists.¹

Writing S_w and S_p for aggregate savings out of Wages and Profits, we have the following income identities :

$$\begin{aligned} Y &\equiv W + P \\ I &\equiv S \\ S &\equiv S_w + S_p. \end{aligned}$$

Taking investment as given, and assuming simple proportional saving functions $S_w = s_w W$ and $S_p = s_p P$, we obtain :

$$I = s_p P + s_w W = s_p P + s_w(Y - P) = (s_p - s_w)P + s_w Y$$

Whence $\frac{I}{Y} = (s_p - s_w) \frac{P}{Y} + s_w \dots \dots \dots (1)$

and $\frac{P}{Y} = \frac{1}{s_p - s_w} \frac{I}{Y} - \frac{s_w}{s_p - s_w} \dots \dots \dots (2)$

Thus, given the wage-earners' and the capitalists' propensities to save, the share of profits in income depends simply on the ratio of investment to output.

The interpretative value of the model (as distinct from the formal validity of the equations, or identities) depends on the "Keynesian" hypothesis that investment, or rather, the ratio of investment to output, can be treated as an independent variable, invariant with respect to changes in the two savings propensities s_p and s_w . (We shall see later that this assumption can only be true within certain limits, and outside those limits the theory ceases to hold). This, together with the assumption of "full employment", also implies that the level of prices in relation to the level of money wages is determined by demand: a rise in investment, and thus in total demand, will raise prices and profit margins, and thus reduce real consumption, whilst a fall in investment, and thus in total demand, causes a fall in prices (relatively to the wage level) and thereby generates a compensating rise in real consumption. Assuming flexible prices (or rather flexible profit margins) the system is thus stable at full employment.

The model operates only if the two savings propensities differ and the marginal propensity to save from profits exceeds that from wages, i.e. if :

and
$$\begin{aligned} s_p &\neq s_w \\ s_p &> s_w \end{aligned}$$

The latter is the stability condition. For if $s_p < s_w$, a fall in prices would cause a fall in demand and thus generate a further fall in prices, and equally, a rise in prices would be cumulative. The degree of stability of the system depends on the *difference* of the marginal propensities, i.e., on $\frac{1}{s_p - s_w}$ which may be defined as the "coefficient of sensitivity of income distribution", since it indicates the change in the share of profits in income which follows upon a change in the share of investment in output.

¹ This may be assumed independently of any skewness in the distribution of property, simply as a consequence of the fact that the bulk of profits accrues in the form of company profits and a high proportion of companies' marginal profits is put to reserve.

If the difference between the marginal propensities is small, the coefficient will be large, and small changes in $\frac{I}{Y}$ (the investment/output relationship) will cause relatively large changes in income distribution $\frac{P}{Y}$; and *vice versa*.

In the limiting case where $s_w = 0$, the amount of profits is equal to the sum of investment and capitalist consumption, i, e , :

$$P = \frac{1}{s_p} I.$$

This is the assumption implicit in Keynes' parable about the widow's cruse—where a rise in entrepreneurial consumption raises their total profit by an *identical* amount—and of Mr. Kalecki's theory of profits which can be paraphrased by saying that "capitalists earn what they spend, and workers spend what they earn."

This model (*i.e.*, the "special case" where $s_w = 0$) in a sense is the precise opposite of the Ricardian (or Marxian) one—here wages (not profits) are a residue, profits being governed by the propensity to invest and the capitalists' propensity to consume, which represent a kind of "prior charge" on the national output. Whereas in the Ricardian model the ultimate incidence of all taxes (other than taxes on rent) fall on profits, here the incidence of all taxes, taxes on income and profits as well as on commodities, falls on wages.¹ Assuming however that $\frac{I}{Y}$ and s_p remain constant over time, the share of wages will also remain constant—*i.e.*, real wages will increase automatically, year by year, with the increase in output per man.

If s_w is positive the picture is more complicated. Total profits will be reduced by the amount of workers' savings, S_w ; on the other hand, the sensitivity of profits to changes in the level of investment will be greater, total profits rising (or falling) by a greater amount than the change in investment, owing to the consequential reduction (or increase) in workers' savings.²

The critical assumption is that the investment/output ratio is an independent variable. Following Harrod, we can describe the determinants of the investment/output ratio in terms of the rate of growth of output capacity (G) and the capital/output ratio, v :

$$\frac{I}{Y} = Gv \dots \dots \dots (3)$$

¹ The ultimate incidence of taxes can only fall on profits (on this model) in so far as they increase s_p , the propensity to save out of *net* income after tax. Income and profits taxes, through the "double taxation" of savings, have of course the opposite effect: they reduce s_p , and thereby make the share of *net* profits in income larger than it would be in the absence of taxation. On the other hand, discriminatory taxes on dividend distribution, or dividend limitation, by keeping down both dividends and capital gains, have the effect of raising s_p . (All this applies, of course, on the assumption that the Government *spends* the proceeds of the tax—*i.e.*, that it aims at a balanced budget. Taxes which go to augment the budget surplus will lower the share of profits in much the same way as an increase in workers' savings.)

² Thus if $s_p = 50\%$, $s_w = 10\%$, $\frac{I}{Y} = 20\%$, $\frac{P}{Y}$ will be 15%; but a rise in $\frac{I}{Y}$ to 21% would raise $\frac{P}{Y}$ to 17.5%. If on the other hand $s_w = 0$, with $s_p = 50\%$, $\frac{P}{Y}$ would become 40%, but an increase in $\frac{I}{Y}$ to 21% would only increase $\frac{P}{Y}$ to 42%. The above formulae assume that average and marginal propensities are identical. Introducing constant terms in the consumption functions alters the relationship between $\frac{P}{Y}$ and $\frac{I}{Y}$ and would reduce the *elasticity* of $\frac{P}{Y}$ with respect to changes in $\frac{I}{Y}$.

In a state of continuous full employment G must be equal to the rate of growth of the “full employment ceiling”, *i.e.*, the sum of the rate of technical progress and the growth in working population (Harrod’s “natural rate of growth”). For Harrod’s second equation :

$$\frac{I}{Y} = s$$

we can now substitute equation (1) above :

$$\frac{I}{Y} = (s_p - s_w) \frac{P}{Y} + s_w.$$

Hence the “warranted” and the “natural” rates of growth are not independent of one another ; if profit margins are flexible, the former will adjust itself to the latter through a consequential change in $\frac{P}{Y}$.

This does not mean that there will be an *inherent* tendency to a smooth rate of growth in a capitalist economy, only that the causes of cyclical movements lie elsewhere—not in the lack of an adjustment mechanism between s and Gv . As I have attempted to demonstrate elsewhere¹ the causes of cyclical movements should be sought in a disharmony between the entrepreneurs’ *desired* growth rate (as influenced by the degree of optimism and the volatility of expectations) which governs the rate of increase of output capacity (let us call it G') and the natural growth rate (dependent on technical progress and the growth of the working population) which governs the rate of growth in output. It is the excess of G' over G —not the excess of s over Gv —which causes periodic breakdowns in the investment process through the growth in output capacity outrunning the growth in production.²

Problems of the trade cycle however lie outside the scope of this paper ; and having described a model which shows the distribution of income to be determined by the Keynesian investment-savings mechanism, we must now examine its limitations. The model, as I emphasized earlier, shows the share of profits $\frac{P}{Y}$, the rate of profit on investment $\frac{P}{vY}$, and the real wage rate $\frac{W'}{L}$, as functions of $\frac{I}{Y}$ which in turn is determined independently of $\frac{P}{Y}$ or $\frac{W'}{L}$. There are four different reasons why this may not be true, or be true only within a certain range.

(1) The first is that the real wage cannot fall below a certain subsistence minimum. Hence $\frac{P}{Y}$ can only attain its indicated value, if the resulting real wage exceeds this minimum rate, w' . Hence the model is subject to the restriction $\frac{W'}{L} \geq w'$, which we may write in the form :

$$\frac{P}{Y} \leq \frac{Y - w'L}{Y} \dots \dots \dots (4)$$

¹ *Economic Journal*, March 1954, pp. 53-71.

² $\frac{I}{Y}$ will therefore tend to equal $G'v$, not Gv . It may be assumed that taking very long periods G' is largely governed by G but over shorter periods the two are quite distinct, moreover G itself is not independent of G' , since technical progress and population growth are both stimulated by the degree of pressure on the “full employment ceiling”, which depends on G' . The elasticity of response of G to G' is not infinite however : hence the greater G' , the greater will be G (the *actual* trend-rate of growth of the economy over successive cycles) but the greater also the ratio $\frac{G'}{G}$ which measures the strength of cyclical forces.

(2) The second is that the indicated share of profits cannot be below the level which yields the minimum rate of profit necessary to induce capitalists to invest their capital, and which we may call the "risk premium rate", r . Hence the restriction :

$$\frac{P}{vY} \geq r \dots \dots \dots (5)$$

(3) The third is that apart from a minimum rate of profit on capital there may be a certain minimum rate of profit on turnover—due to imperfections of competition, collusive agreements between traders, etc., and which we may call m , the "degree of monopoly" rate. Hence the restriction :

$$\frac{P}{Y} \geq m \dots \dots \dots (6)$$

It is clear that equations (5) and (6) describe *alternative* restrictions, of which the higher will apply.

(4) The fourth is that the capital/output ratio, v , should not in itself be influenced by the rate of profit, for if it is, the investment/output ratio Gv will itself be dependent on the rate of profit. A certain degree of dependence follows inevitably from the consideration, mentioned earlier, that the value of particular capital goods in terms of final consumption goods will vary with the rate of profit,² so that, even with a *given technique* v will not be independent of $\frac{P}{Y}$. (We shall ignore this point). There is the further complication that the relation $\frac{P}{Y}$ may affect v through making more or less "labour-saving" techniques profitable. In other words, at any given wage-price relationship, the producers will adopt the technique which maximizes the rate of profit on capital, $\frac{P}{vY}$; this will affect (at a given G) $\frac{I}{Y}$, and hence $\frac{P}{Y}$. Hence any rise in $\frac{P}{Y}$ will reduce v , and thus $\frac{I}{Y}$, and conversely, any rise in $\frac{I}{Y}$ will raise $\frac{P}{Y}$. If the sensitiveness of v to $\frac{P}{Y}$ is great, $\frac{P}{Y}$ can no longer be regarded as being determined by the equations of the model; the *technical* relation between v and $\frac{P}{Y}$ will then govern $\frac{P}{Y}$ —whereas the savings equation (equation (2) above) will determine $\frac{I}{Y}$ and thus (given G) the value of v .³ To exclude this we have to assume that v is invariant to $\frac{P}{Y}$,⁴ i.e. :

$$v = \bar{v} \dots \dots \dots (7)$$

¹ Where L = labour force.

² Cf. p. 90 above. In fact the whole of the Keynesian and post-Keynesian analysis dodges the problem of the measurement of capital.

³ This is where the "marginal productivity" principle would come in but it should be emphasized that under the conditions of our model where savings are treated, not as a constant, but as a function of income distribution, $\frac{P}{Y}$, the sensitiveness of v to changes in $\frac{P}{Y}$ would have to be very large to overshadow the influence of G and of s_p and of s_w on $\frac{P}{Y}$. Assuming that it is large, it is further necessary to suppose that the value of $\frac{P}{Y}$ as dictated by this technical relationship falls within the maximum and minimum values indicated by equations (4)-(6).

⁴ This assumption does not necessarily mean that there are "fixed coefficients" as between capital equipment and labour—only that technical innovations (which are also assumed to be "neutral" in their effects) are far more influential on the chosen v than price relationships.

If equation (4) is unsatisfied, we are back at the Ricardian (or Marxian) model.

$\frac{I}{Y}$ will suffer a shrinkage, and will no longer correspond to Gv , but to, say, αv where $\alpha < G$.

Hence the system will not produce full employment ; output will be limited by the available capital, and not by labour ; at the same time the classical, and not the Keynesian, reaction-mechanism will be in operation : the size of the "surplus" available for investment determining investment, not investment savings. It is possible however that owing to technical inventions, etc., and starting from a position of excess labour and underemployment (*i.e.*, an elastic total supply of labour) the size of the surplus will grow ; hence $\frac{I}{Y}$ and α will grow ; and hence α might rise above G (the rate of growth of the "full employment ceiling", given the technical progress and the growth of population) so that in time the excess labour becomes absorbed and full employment is reached. When this happens (which we may call the stage of *developed* capitalism) wages will rise above the subsistence level, and the properties of the system will then follow our model.

If equations (5) and (6) are unsatisfied, the full employment assumption breaks down, and so will the process of growth ; the economy will relapse into a state of stagnation. The interesting conclusion which emerges from these equations is that this may be the result of several distinct causes. "Investment opportunities" may be low because G' is low relatively to G , *i.e.*, the entrepreneurs' expectations are involatile, and/or they are pessimistic ; hence they expect a lower level of demand for the future than corresponds to potential demand, governed by G . On the other hand, "liquidity preference" may be too high, or the risks associated with investment too great, leading to an excessive r . (This is perhaps the factor on which Keynes himself set greatest store as a cause of unemployment and stagnation.) Finally, lack of competition may cause "over-saving" through excessive profit margins ; this again will cause stagnation, unless there is sufficient compensating increase in v (through the generation of "excess capacity" under conditions of rigid profit margins but relatively free entry) to push up Gv , and hence $\frac{I}{Y}$.

If however equations (2)-(6) are all satisfied there will be an inherent tendency to growth and an inherent tendency to full employment. Indeed the two are closely linked to each other. Apart from the case of a developing economy in the immature stage of capitalism (where equation (4) does not hold, but where $\gamma < G$), a tendency to continued economic growth will only exist when the system is only stable at full employment equilibrium—*i.e.* when $G' \geq G$.

This is a possible interpretation of the long-term situation in the "successful" capitalist economies of Western Europe and North America. If G' exceeds G , the investment/output ratio $\frac{I}{Y}$ will not be steady in time, even if the *trend* level of this ratio is constant.

There will be periodic breakdowns in the investment process, due to the growth in output capacity outrunning the possible growth in output ; when that happens, not only investment, but total output will fall, and output will be (temporarily) limited by effective demand, and not by the scarcity of resources. This is contrary to the mechanics of our model, but several reasons can be adduced to show why the system will not be flexible enough to ensure full employment in the short period.

(1) First, even if "profit margins" are assumed to be fully flexible, in a downward, as well as an upward, direction the very fact that investment goods and consumer goods are produced by different industries, with limited mobility between them, will mean that profit margins in the consumption goods industries will not fall below the level that ensures full utilization of resources in the consumption goods industries. A *compensating* increase

in consumption goods production (following upon a fall in the production of investment goods) can only occur as a result of a transfer of resources from the other industries, lured by the profit opportunities there.

(2) Second, and more important, profit-margins are likely to be inflexible in a downward direction in the short period (Marshall's "fear of spoiling the market") even if they are flexible in the long period, or even if they possess short period flexibility in an upward direction.¹

This applies of course not only to profit margins but to real wages as well, which in the short period may be equally inflexible in a downward direction at the *attained* level, thus compressing $\frac{I}{Y}$, or rather preventing an *increase* in $\frac{I}{Y}$ following upon a rise in the entrepreneurs' desired rate of expansion G' . Hence in the short period the shares of profits and wages tend to be inflexible for two different reasons—the downward inflexibility of $\frac{P}{Y}$ and the downward inflexibility of $\frac{W}{L}$ —which thus tend to reinforce the long-period stability of these shares, due to constancy of $\frac{I}{Y}$, resulting from the long period constancy of Gv and $G'v$.

We have seen how the various "models" of distribution, the Ricardo-Marxian, the Keynesian and the Kaleckian are related to each other. I am not sure where "marginal productivity" comes in in all this—except that in so far as it has any importance it does through an extreme sensitivity of v to changes in $\frac{P}{Y}$.

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¹ Cf. the quotation from Marshall, note 2, page 93 above.

² This operates through the wage-price spiral that would follow on a reduction in real wages; the prevention of such a wage-price spiral by means of investment rationing of some kind, or a "credit squeeze", is thus a manifestation of downward inflexibility of $\frac{W}{Y}$.