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**MULTIMARKET CLASSIFICATION OF UNEMPLOYMENT:
A SCEPTICAL NOTE**

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MULTIMARKET CLASSIFICATION OF
UNEMPLOYMENT: A SCEPTICAL NOTE*

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ABSTRACT

Using a simple two sector vintage model, the paper demonstrates an inherent logical weakness of the proposed distinction between "Classical" and "Keynesian" unemployment. Without violating the usual marginal rules of profit maximization, the paper shows how Classical and Keynesian unemployment can alternate at different real wage rates so that, characterization of unemployment in terms of 'high' or 'low' real wage becomes meaningless.

RESUMEN

Haciendo uso de un "vintage model" simple de dos sectores, este trabajo exhibe una debilidad lógica inherente en la diferenciación propuesta entre desempleo "Clásico" y "Keynesiano". Sin violar las reglas usuales de maximización de ganancias, el trabajo muestra cómo el desempleo Clásico y Keynesiano pueden alternar a diferentes tasas de salarios reales, por lo que la caracterización del desempleo en términos de salarios reales "altos" o "bajos" pierde sentido.

I. The Argument

It has been recently argued that a useful classification of the nature of unemployment can be obtained in the context of multimarket analysis by simultaneously considering the labour market and the market for commodities: when unemployment coexists with excess supply of commodities, it is described as Keynesian unemployment; however unemployment coexisting with excess demand in the commodity market is considered Classical (Malinvaud, 1977)^{1/}. In the absence of any real balance effect, this distinction between Keynesian and Classical unemployment could be linked to the influence of the level of real wage rate on the nature of unemployment. Because, in the absence of a real balance effect, a relatively "low" real wage rate precipitates the problem of effective demand, generating excess supply in the commodity market. Contrariwise, too "high" a real wage rate curtails the profitability of production resulting in a low level of production and consequently, excess demand in the commodity market. This, if the real balance effect could be ignored as a first approximation, it would be plausible to associate Keynesian unemployment with a relatively "low" and Classical unemployment with a relatively "high" real wage rate.^{2/} And, on the basis of such a classification, it could then be argued that a reduction in the real wage rate can cure at least Classical unemployment, as presumed by the pre-Keynesian or Classical orthodoxy.

The basic rationale of the above distinction between Keynesian and Classical unemployment rests upon two contradictory effects arising from the variation in the real wage rate on the

level of employment and output. Supposing, prices to be fixed, a higher money (and, hence a higher real) wage rate would tend to stimulate effective demand; further the assumption of fixed prices would also ensure that the influence of the real balance effect on the level of effective demand is negligible.^{3/} On the other hand, a higher money (and real) wage rate with prices fixed, will also tend to depress "business profitability" and therefore, the production level. Hicks distinguished between a "savings effect" and a "substitution effect" resulting from variations in the real wage rate to emphasise how these contradictory pulls operate on the level of employment (Hicks 1973). For instance, a higher real wage rate stimulates effective demand by reducing savings through redistribution of income from profits to wages (under the assumption that more is saved out of profits than out of wages). However, a higher real wage rate also tends to depress the profitability of production and encourage substitution in favour of labour-intensive methods of production; consequently, the "derived demand" for labour would tend to decrease through such "substitution effect" at a higher real wage rate.^{4/}

In order to capture these contradictory effects resulting from variation in the money (and real) wage rate at fixed prices (so that, the real balance effect may be ignored), it seems useful to set up the argument in terms of a model which combines consideration of effective demand arising from the "savings effect" with that of profitability of production resulting from the "substitution effect". An argument constructed on the assumption of short-period

profit maximization by firms in a two-sector, vintage model seems especially suitable for this purpose. The vintage approach allows us to avoid many familiar capital-theoretic problems in analysing the "substitution effect" arising from variations in the real wage rate,^{5/} whereas the two-sector breakdown is essential in the present context for understanding the problem of generation of effective demand or profit realization, along the line suggested particularly by Kalecki (1971) and Joan Robinson (1956), following Marx (1971).

Consider a short-period situation of given capital stock in the form of machines of various vintages in the investment - and in the consumption - sector. Let subscript i and c stand for the two sectors respectively; machines are assumed to be non-shiftable between the sectors in the short-run.

Let, $n_j(v)$ = labour employed in vintage of index v in sector j

$x_j(v)$ = labour productivity in vintage of index v in sector j

and, T_j -- number of vintages (assumed a continuous variable) employed in sector j which corresponds to the life-time of machines in sector j ($j = i$ or c)

Consequently, aggregate output of sector j can be written as,

$$X_j = \int_{v=0}^{T_j} n_j(v) x_j(v) dv \quad (1)$$

To keep the algebra simple, we make two special assumptions. First,

labour productivity is assumed to decrease linearly as the index of vintage, v increases i.e,

$$X_j(v) = a_j - b_j v, \quad a_j > 0, \quad b_j > 0 \quad (j=i \text{ or } c) \quad (2)$$

where, a_j = productivity of labour on best-practice, current vintage in sector j ($j= i$ or c).

Secondly, we assume that all vintages employ the same number of workers^{6/} which we can use as our unit of measurement for labour i.e,

$$n(v) = 1, \quad \text{for all } v. \quad (3)$$

Using (2) and (3) in (1) we obtain the expression for aggregate output in sector j as,

$$X_j = \int_{v=0}^T (a_j - b_j v) dv = a_j T_j - \frac{1}{2} \cdot b_j T_j^2, \quad (j=i \text{ or } c) \quad (4)$$

and, aggregate employment in sector j as,

$$N_j = \int_{v=0}^T n(v) \cdot dv = T_j \quad (j = i \text{ or } c) \quad (5)$$

If $P_j =$ fixed price per unit of output in sector j ($j = i$ or c)

and, $w_m =$ uniform money wage rate throughout the economy then, with labour as the only variable cost, the expression for (gross) profit in sector j is given as,

$$R_j = p_j X_k - w_m N_j \quad (j = i \text{ or } c) \quad (6)$$

Using (4) and (5) in (6), the first - order condition for profit maximization^{7/} with respect to the number of vintages commissioned can be seen as, $\frac{dR_j}{dT_j} = 0$ implying,

$$(a_c - b_c T_c) = w, \text{ where, } w = \left(\frac{w_m}{P_c}\right), \text{ the real wage rate} \quad (7)$$

$$\text{and, } (a_i - b_i T_i) = \left(\frac{w_m}{P_i}\right) = \frac{w}{p}, \text{ where, } p \equiv \frac{P_i}{P_c} \quad (8)$$

Conditions (7) and (8) are familiar "marginal productivity conditions" in vintage models showing that the value of labour productivity in the oldest vintage commissioned (on the left hand side of (7) or (8)) just breaks even labour cost i.e the wage rate, measured in the numeraire of consumption good. Also, being marginal productivity conditions, they represent the demand for labour in the two respective sectors (see condition (5) above) as functions of real wage rate in terms of consumption goods, given fixed prices in both sectors.

In our two department scheme adequate effective demand for clearing of the market for consumption goods, would require the surplus over the wage bill of the consumption sector to be matched by capitalists' consumption plus wage bill of the investment sector, if all wages are assumed to be consumed (Robinson, 1956; pp. 43-45). This would also ensure that the surplus consumption goods is exactly realized into profits without any unplanned changes in the inventory of final consumption goods (Kalecki, 1971; p. 78). Assuming (for

algebraic simplicity) that all profit and no wage is saved so that, Hicks' "savings effect" arising from real wage variation, operates in the most pronounced manner on the level of effective demand, the condition for the clearing of the consumers' goods market would yield,

$$\begin{aligned} & \text{Real wage bill in the investment sector } (W_i) \\ & = \text{Surplus over real wage bill in the} \\ & \quad \text{consumption sector } (S_c) \frac{8}{} \end{aligned} \quad (9)$$

However, (5) and (8) yield the real wage bill of the investment sector as,

$$W_i = wT_i = \frac{w(pa_i - w)}{Pb_i} \quad (10)$$

Further, (4), (5) and (7) yield the surplus of the consumption sector as,

$$S_c = X_c - w N_c = \frac{(a_c - w)^2}{2 b_c} \quad (11)$$

It will be seen from expression (10) that the real wage bill of the investment sector W_i increases as a function of the real wage rate w for $w < \frac{pai}{2}$ reaching a maximum at $w = \frac{pai}{2}$ and, for $w > \frac{pai}{2}$, wage elasticity of demand for labour exceeds unity and W_i begins to decrease as w is further increased.

From (11), the surplus of the consumption sector S_c is throughout a decreasing function of the real wage rate w , convex to the origin.

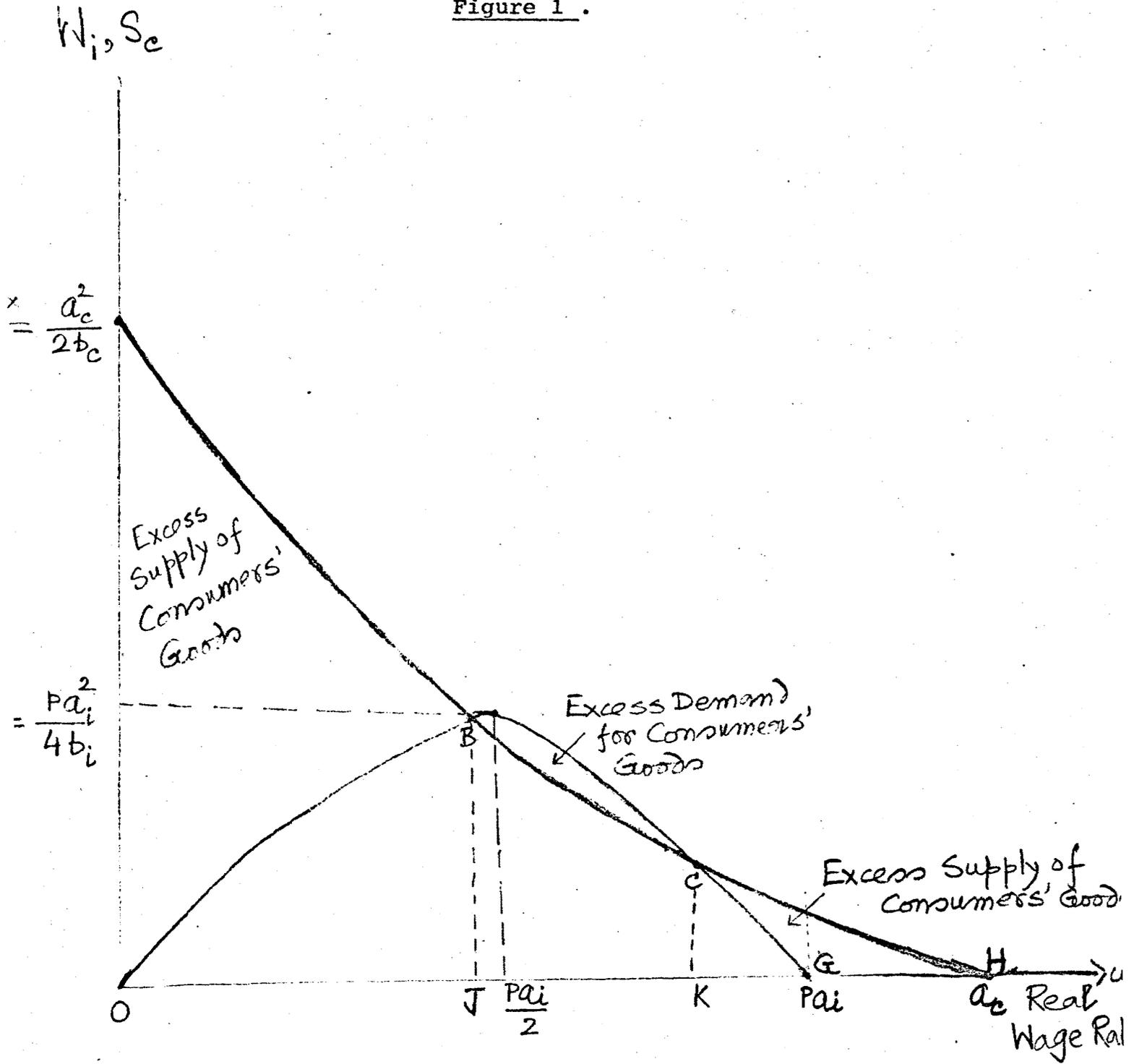
Figure 1 depicts these two relations _____ W_i and S_c as functions of the real wage rate, w _____ to show how excess supply or demand for consumption goods can occur at different levels of the real wage rate. Since the market for consumption goods is cleared only when (9) holds, (9), (10) and (11) could be used together to yield the possible real wage rates (e.g. OJ and OK in Figure 1) that clear the consumption goods market. This results in a quadratic equation,

$$\left(\frac{1}{2b_c} + \frac{1}{pb_i}\right) w^2 - \left(\frac{a_c}{b_c} + \frac{a_i}{b_i}\right) w + \frac{a_c a_i}{2b_c} = 0 \dots (12)$$

showing the possibility of two real, positive roots.

If both the roots are real and positive, as assumed in Figure 1^{9/}, then intersections at points B and C exhibit configurations at which the consumption goods market is cleared. Thus, for real wage rates less than OJ, surplus of the consumption sector S_c exceeds the real wage bill of the investment sector W_i and there would be excess supply of consumption goods under the assumption of profit maximization in both sectors. Similarly, for real wage rates lying between OJ and OK, W_i exceeds S_c and there would be excess demand for consumption goods. However, for still higher real wage rates exceeding OK, there is again excess supply of consumption goods. This simple

Figure 1 .



construction of Figure 1 should warn us against assuming that excess supply of consumption goods is necessarily associated with a relatively "low" real wage rate; indeed excess supply can arise in the market for consumption goods at higher real wage rate exceeding OK.

The implication of the above analysis for multimarket classification of unemployment can be seen to be problematic: for any given real wage rate, equations (7) and (8) together (in view of (5)) will determine the demand for labour, while there would also be a corresponding supply of labour at that wage rate. This enables us to postulate a real wage rate at which the labour market is cleared. Although there is no presumption that such a full-employment real wage rate also clears the commodity market, for the sake of argument, we may suppose that this full-employment wage rate is exactly OJ in figure 1, defining a "Walrasian equilibrium". If the ruling real wage rate is somewhat above OJ (e.g. $OK > w > OJ$), then the resulting unemployment can be said to be Classical in nature i.e., unemployment coexisting with excess demand for consumption goods. However, at still higher real wage rates (e.g. $w > OK$) unemployment assumes Keynesian characteristics of excess supply in the commodity market. This possibility demonstrates that there can be no logical presumption that Classical unemployment obtains at relatively 'high' and Keynesian unemployment at relatively 'low' real wage rate; indeed, exactly the opposite has been-

shown to be the case in the above construction.

II Concluding comments

The preceding argument makes no claim to realism. It was deliberately set out in neo-classical terms of short-period profit maximization leading to marginal productivity conditions (equations (6) to (8)) under increasing marginal costs of production. Such assumptions hardly suit the description of industrial capitalism (Kahn, 1977). The only purpose of introducing them was to show how simultaneous profit maximization in both the investment and the consumption sector can result in different patterns of excess demand or supply of consumption goods coupled with unemployment. Since unemployment is used as a postulate of our model in the relevant range of the real wage rate (e.g, $w > OJ$), nothing is gained in the argument by introducing the further assumption of utility-maximizing labour-households, as it only modifies the supply function of labour. Similarly, working strictly in terms of a fix-price model where the money (and therefore, the real) wage rate is varied, the complications arising from the "real balance effect" on financial assets held by labour household could be largely avoided. Without explicitly accomodating financial assets, the argument operates exclusively in terms of the influence of real wage rate on the level of effective demand for commodities produced by the consumption sector (and, in this respect it is closer to Malinvaud, 1982).

Nevertheless, the absence of any explicit treatment of financial assets raises another important point.

It will be noted that the preceding argument left open the problem of realization of profit in the investment sector. In the absence of an explicit demand function for investment goods, there is no way in which the model can ascertain whether the profit-maximizing output of the investment sector at each given real wage rate (determined by substituting the value of T_1 from (8) into (4)) can find an adequate market. Thus, unplanned changes in the inventory of final investment goods, indicating the state of excess demand or supply in the investment goods market, would be a direct consequence of postulating an independent "investment function". Although this would be an appropriate route to take to extend the present analysis, the absence of any reliable investment function^{10/} makes it useful to provisionally 'close' the present model through an alternative assumption: if we assume that investment goods also serve as financial assets (i.e., the 'store of value' function of money), then unplanned inventory changes of final investment goods would be considered by firms in that sector as equivalent to changes in their asset position; consequently, they would produce investment goods to the profit-maximizing level (given by condition (8)) while adjusting their inventories in accordance with the (unspecified) level of demand for

investment goods. Needless to add, this provisional assumption is not plausible; it merely allows us to formally complete the two-sector analysis in the present, limited context.

The inadequacy of the preceding analysis to explain the problem of realization of profits in the investment sector arises from the fact that demand is endogenous for consumption goods (see, condition (9)) but exogenous for investment goods (at least, until the investment function is specified). This 'endogeneity' of the demand for consumption goods (more exactly, "wage-goods" as no profit is consumed) is central to the macroeconomic tradition of writers such as Marx, Kalecki and Keynes. The problem of effective demand or profit realization in the consumption sector can be properly understood only by distinguishing between consumption goods and non-consumable investment goods; because, the wage-bill of the workers engaged in producing non-consumables provides the market for realizing the surplus of the consumption sector into profits (condition (9)). This macroeconomic insight, originally due to Marx and imaginatively exploited by Joan Robinson in her numerous writings on capitalistic accumulation (especially, Robinson, 1956), seems to have been largely lost sight of in the recent search for a microeconomic foundation of the macro-theory of effective demand. Thus, in most such models demand comes from the consuming households and from autonomous government sources (Malinvaud, 1977; Barro and Grossman, 1976), without making it clear that expansion in the production of all

non-wage goods creates demand for wage-goods (the consumption sector in the present context, as all profits are saved); whereas expansion in the production of wage goods only creates more surplus seeking realization into profits^{11/}. Any reduction in the money wage rate at fixed prices would raise "business profitability" of both investment and consumption (wage-) goods; but the former raises the demand, whereas the latter raises the 'surplus' or supply of consumption (wage-) goods. It was precisely this interaction between demand and supply, creating alternative patterns of excess demand or supply of consumption (wage-) goods, that was investigated under highly simplifying assumptions in the preceding analysis, only to demonstrate the logical weakness of the proposed dichotomy between Classical and Keynesian unemployment. And, although the present demonstration is based on particular assumptions, it derives from an argument that is far more general in character.

Footnotes.

1/ With only two markets ____ for labour and for consumption goods ____ a fourfold classification obtains in principle, depending on various combinations of excess demand and supply in each market (Malinvaud, 1977 p. 31). Since we are interested only in classifying unemployment, excess supply in the labour market is presumed, yielding a twofold classification between Classical and Keynesian unemployment.

2/ Malinvaud writes, "Classical Unemployment... is typical of a situation in which real wages are too high, so that firms do not find it profitable to employ all the labour force". However, Keynesian unemployment is said to "occur when prices are too high in comparison with nominal assets (m) of consumers and given the volume of autonomous demand (g)". (Malinvaud, 1977 p. 85). Since autonomous demand (g) is assumed as given, the lower level of effective demand is produced in the above definition of Keynesian unemployment only in terms of a real balance effect caused by higher prices. However, in a strictly fix-price model, such real balance effect may be ignored; instead, the lower level of effective demand may be postulated to operate primarily through a lower money (and real) wage rate reducing consumers' demand.

3/ In other words the real balance effect is ignored by considering variations in the money wage rate at fixed prices in contrast to Malinvaud-type argument, where alternative configurations of nominal price level and money wage rate are considered. The assumption that money wage variation would have no influence on prices is obviously unsound insofar as prices are cost-determined on a 'mark-up' basis. But such link between prices and money wages _____ central to Keynes' "wage-unit" measurement and Kalecki's theory _____ finds no place in Malinvaud's formal discussion.

4/ See, Malinvaud (1977, p. 67) also using this Hicksian distinction.

5/ We can agree with Hahn (Hahn, 1982, p. 373) that "Sraffa's work (on reswitching and the general impossibility of capital aggregation) shows that certain simplified routes are very risky and not free from logical difficulties". Both through influencing the (extensive) margin of operation and also, the distribution between profits and wages (since the share of profit decreases with older vintages), the vintage approach is a convenient route for analysing the "substitution effect" associated with real wage variation.

6/ Neither assumption is essential to our argument. Particularly, the assumption of all vintages employing the same number of worker could be dropped to show more explicitly the influence of past investment decisions. However, since such past history would generally be different for every short-period situation, not much is gained (and the algebraic simplicity is lost) by replacing this assumption by another particular set of assumptions about past investment decisions.

7/ The second order condition is also satisfied because, $b_j > 0$.

8/ Under condition (9), surplus of consumption goods (S_e) is realized into profits of that sector (R_e) without unplanned accumulation (if, $S_c > W_i$) of inventories of final consumption goods. Hence, satisfaction of (9) implies,

$$W_i = S_c = R_c.$$

If we postulate no problem of realization in the investment sector (an assumption discussed later in the text), then adding profits of the investment sector (R_i) on both sides, the resulting equilibrium condition for investment-saving equality emerges as:
 $(W_i + R_i) = \text{Value added by the investment sector} = (R_c + R_i) = \text{Total profits, which is the same as Kalecki's formulation, if no wage and all profit are saved (Kalecki, 1971; p. 78)}.$

9/ For limitation of space, cases of conjugate complex roots (e.g, ABCH always lying above OBECG) or repeated roots (e.g. ABCH tangent to OBECG at some point) are not discussed. With both roots positive, the existence of Classical unemployment is ensured and, our point can be effectively demonstrated.

10/ Malinvaud (1982), for instance, specifies an "investment function" akin to Tobin's q-theory of investment, to trace out a more dynamic model. However, his one-commodity, aggregate capital model is totally inadequate to study the feedbacks between excess demand and supply in the investment and in the consumption goods market, along the line hinted at above.

11/ In this sense, the assumption of autonomously given government expenditure (and also, the real balance effect) obscures the endogenous mechanism for generation of demand for consumption (wage-) goods.

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