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Halevi, Joseph, Employment, investment and structural maturity, Department of Economics, University of Wollongong, Working Paper 90-3, 1990, 9.
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THE UNIVERSITY OF WOLLONGONG
DEPARTMENT OF ECONOMICS

EMPLOYMENT, INVESTMENT
AND
STRUCTURAL MATURITY

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Working Paper 90-3,

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ISSN 1035-4581
ISBN 08-6418-107-8

1. The context

This paper takes its bearings from Edmond Malinvaud's approach to unemployment and profitability (Malinvaud, 1980). In particular I will switch Malinvaud's *problematique* from the definition of unemployment regimes to the discussion of capacity utilization regimes. It will be seen that by setting the question of utilization rates at the center of the analysis, the structure of production - disregarded in Malinvaud's work - emerges as the major determinant of the relationship between utilization rates, employment levels and the sectoral deployment of the labor force.

The choice of the sectoral specification of the economy is made along Marxian lines whereby production is split between capital goods and consumption goods. The explicit existence of an investment sector immediately brings to the fore issues of a dynamic nature related to changes in the level of the stock of capital. In fact, as soon as we have a positive utilization rate in the capital goods sector we are bound to ask whether the output of investment goods is less than, equal to, or greater than replacement requirements. The absence in Malinvaud of an analytical consideration of the structure of production, leads him to remain within the momentary equilibrium framework which is of secondary relevance to the understanding of processes relating labor to the stock of capital.

Although this paper contains a somewhat critical perspective on Malinvaud's approach, it is definitely recognized that *Profitability and Unemployment* represents a contribution, which, had it not been written during the high tide of Rational Expectations economics, could have substantially rekindled the debate around themes developed earlier by Joan Robinson (1956), Nicholas Kaldor (1938, 1956), Michal Kalecki (1954), Paul Sweezy (1953), and later by Michio Morishima (1968). Indeed, it could have made that stream of thought - which is heavily informed by Marx's and Keynes' economics - into a part of mainstream theorizing.

Common to the abovementioned authors is the view that capitalist accumulation can reach a stage of structural maturity; that is a situation in which past accumulation has brought the stock of capital to such a level that it could employ more than the available labor force. For Kalecki and Sweezy structural maturity is connected with the oligopolistic character of contemporary capitalist economies. In these circumstances, if there is full employment labor shortages would create an inflationary situation. Yet since capital stock is overabundant, capacity cannot be fully utilized leading to a possible breakdown in investment and to unemployment due to lack of effective demand. The origin of the notion of structural maturity can be dated back to Kaldor (1938) and Harrod (1939). While Kaldor pointed at a possible imbalance between workers and machines, it was Harrod who put forward the view that a too high growth rate in relation to the productive capacity of the labor force may end up in a state of chronic depression.

It is this framework which was resurrected by Malinvaud who presented two main cases: one in which productive capacity is too low ($y < \beta L$, where: y is future productive capacity, β is the given labor productivity, L is the labor force) and one in which it is too high ($y > \beta L$). In both instances the growth of the labor force L is assumed to be zero. Having anchored the analysis to a stationary situation, Malinvaud proceeds by means of approximations to Walrasian equilibria to find out what kind of unemployment regimes emerge from the two hypotheses. While the second is generally conducive to Keynesian unemployment, the first may end up in a Keynesian situation although the economy is initially characterized by classical surplus labor.

It is easy to see that Malinvaud has taken up the Harrodian question of the warranted rate being higher (or lower) than the natural rate. The difference consists in that Malinvaud assumed a static framework - where capacity is greater than the level required to ensure full employment under a zero natural growth rate - in order to gauge the possible outcomes in terms of Walrasian equilibria. For the purposes of figuring out unemployment

conditions, I see no wrong in Malinvaud's procedure. My objection is to his complete neglect of issues related to the dynamic and the composition of the stock of capital. The real link between the present and the future is precisely the sectoral composition of productive capacity.

In what follows I will concentrate mainly on the case $y > \beta L$ as I think it is of far greater relevance than the first. Indeed for $y < \beta L$ to be economically significant the underlying productive basis should be rather under developed. Consider for instance an economy with large unused capacities in the investment goods sector. As a consequence the production of capital goods may well be less than replacement requirements, thereby pushing the full capacity output of the economy below βL . However a developed economy usually has a capital goods sector which can quickly make up for lost output and generate a high growth rate in the stock of capital. The transition from Depression to war production of the American economy, is an example of the high productive power of a hitherto stagnant - yet developed - economic system (Vatter, 1985). In other words, in a mature industrial system the warranted growth rate is tendentially above the natural one and this is the *differentia specifica* between developed and underdeveloped capitalist economies (Kalecki, 1976; Halevi, 1987, 1981). Hence, even if at times $y < \beta L$ does hold, it should not be confused with a limited productive power of the capital goods industry. Thus, $y < \beta L$ seems to be of secondary importance for the analysis of the problems of economies where the forces of industrial production have been developing over a number of centuries.

2. A change of perspective when $y > \beta L$

When an economy is thought of in terms of a too high productive capacity, the question before us is not only what are the possible configurations of unemployment, but also that concerning the manner in which full employment can be maintained. This way of seeing the case $y < \beta L$ will highlight the analytical role of Marx's structural relations and the limits of demand management policies.

The need for a sectoral approach to macroeconomics was appropriately stressed twenty five years ago by John Hicks (1965) when he observed that one commodity growth models were of a primitive kind because they could not logically take into account the creation of undesired inventories. If inputs and outputs are homogenous, the one commodity inequality $y < \beta L$ can be reduced to an equality simply by raising consumption. In Ricardian terms, it is as if the previous year's harvest of corn turned out to be too large vis a vis the replowing capacity (i.e. productivity) of the fully employed agricultural workers. The excess corn can be *ipso facto* transformed into additional consumption accruing either to the workers and/or to the landlords. It is true that in agrarian mercantile societies every unexpected increase in staples output unleashed formidable speculative pressures from landlords and money lenders. But this was precisely because production was not capitalistic, i.e. it could not be conceptualized by means of an industrially given rate of labor productivity β , since this very rate was subject to significant fluctuations ruling out all the technologically deterministic elements which govern modern capitalist production¹. In contemporary economies the pattern of accumulation as well as crises in the pattern itself, are physically expressed by the sectoral structure of capital stock, employment and output; phenomena which cannot be grasped by primitive one commodity models.

The development of manufacturing is historically associated with a composition of output characterized by the emergence of the capital goods sector (Rosenberg, 1976). But the

¹ The deterministic elements inherent in machine based systems were fully understood by Marx in the chapter on machinery in Volume One of Capital. He argued that only when output is produced by means of machines connected through definite technical relations, can production be studied scientifically (Marx, 1974,1,ch.15).

essential condition for the rise of a machine based system of production was the availability of malleable, thus abstract, labor. Consequently, the assumption of a homogenous workforce can be retained in this context.

3. Unused capacity conditions with $y > \beta L$ and with full employment objectives

Our hypothetical economy starts off with an excess in the aggregate stock of capital relatively to the available workers:

$$(1) \quad nK > L; \text{ where: } n \text{ is the uniform crew per unit of the stock of capital } K.$$

The homogenous stock K is distributed between the two sectors and cannot be shifted. Since inequality (1) implies unused capacity can n can be set equal to unity, (1) gets transformed into:

$$(2) \quad L = K[u_i m + u_c (1-m)]; \text{ where } u_i \text{ and } u_c \text{ are the utilization rates in the}$$

capital and consumption goods sectors respectively; m is the share of the stock K installed in the capital goods sector. Thus, mK is the stock of capital in the investment goods industries while $(1-m)K$ is the stock in the consumption goods sector. Non shiftability means that regardless of utilization rates changes in the allocation ratio $m/(1-m)$ can take place only by varying the sectoral distribution of the flow of gross investment goods produced.

The demand for consumption goods is determined by workers' and capitalists' spending on consumption goods. The latter is neglected on the grounds that the central issue in mature economies is the question of capacity utilization and the underlying sectoral structure rather than the distribution of consumption between workers and capitalists. Abstracting from capitalists' consumption, the output of consumables is in equilibrium with workers' spending given the utilization rate in the consumption goods sector.

$$(3) \quad C = u_c b(1-m)K - (w/p)L; \text{ where } C \text{ is the quantity of consumption goods;}$$

b is the output-capital ratio in the consumption goods sector; w/p is the real wage rate with no propensity to save.

Substituting (2) for L in (3) and solving for w/p , we obtain the link between the real wage rate and the sectoral distribution of capacity utilization:

$$(4) \quad [w/p] = u_c b(1-m) / [u_i m + u_c (1-m)]$$

It follows that w/p is positively related to the degree of utilization in the consumption goods sector.

As long as $u_i > 0$ there will be some positive gross output of investment goods.

Mature economies can generate a net amount of investment goods even with spare capacity in the capital goods sector. Historically, a positive rate of capital formation is not incompatible with spare capacity in the machine building industries. In this context, the initial utilization rates u_i and u_c can be taken to represent past production decisions based on demand expectations which justified a positive net output of capital goods even with spare capacity. The assumption of no growth of the labor force is like ascribing unfulfilled expectations to this single factor. The procedure is not unreasonable given the simplicity of the model, where - *ceteris paribus* - unpredicted events materialize in a discrepancy between the growth rate of capacity and that of the labor force. In our example, we would have:

(5) $u_i a m K > q[u_i m + u_c(1-m)]K$; where a is the output-capital ratio in the

capital goods sector; q is the rate of depreciation calculated for simplicity only on the utilized part of the stock K . Hence $u_i a m K$ is gross investment goods output.

As in Malinvaud, L is not growing. This means that the actually operating stock of capital $K^* = [u_i m + u_c(1-m)]K$, is the stock which would be in equilibrium with the labor force, if unused capacity could be eliminated without creating a Harrodian breakdown in activity. The first step is to reduce the output of investment goods to a level not greater than qK^* . The utilization rate in the capital goods sector ensuring replacement investment equal to qK^* is given by:

(6) $u^*_i = (q/am)[u_i m + u_c(1-m)]$; where $u^*_i < u_i$

If full employment is to be kept also during the readjustment period, it is necessary that to the lower rate of utilization in the capital goods sector there correspond a higher rate in the consumption goods sector. This is achieved by shifting workers from the capital goods to the consumption goods sector as the utilization rate u_i falls. According to equation (3) the real wage rate will increase. The distribution of employment between the two sectors will be measured by:

(7) $L = K[u^*_i m + x(1-m)]$; where x is what the utilization rate in the

consumption goods sector *ought to be* once u^*_i is attained.

The value of x is calculated by equating (7) with (2), i.e. by comparing the previous deployment of the labor force with its *planned* sectoral redeployment within the same stock of capital. The solution for x may turn out to be inconsistent with the strategy of keeping the stationary labor force fully employed with the existing stock of actually operating capital K^* . The expression for x is:

(8) $x = [m(u_i - u_c) + u_c - mu^*_i]/(1-m)$

As long as the value of u^*_i - determined solely by the need to bring gross investment down to the replacement level of K^* - allows for x , the new rate of utilization in the consumption goods sector, to be equal or near unity, part of the labor force can be successfully shifted from building machines to producing consumables. If the amount of labor absorbed by the consumption goods sector is equal to the amount of labor released by the capital goods sector, the utilized part of the given stock K^* is in equilibrium with the labor force in the economy, not only globally but also sectorally. Gross investment will be in line with qK^* , and real wages will be higher.

The economy is posed to settle into a Robinsonian state of bliss provided that the remaining excess machinery is discarded. In our framework if x is close to unity, the extra machinery in the capital goods sector will be amount to $(1-u^*_i)mK$. It does not take much imagination to realise that in a private and/or cooperative non planned system, discarding cannot happen without affecting employment and output. The way in which the operation of getting rid of the unnecessary capital stock can be performed, is by taking the machines out of the market. The Planning Agency should just throw them away. Interestingly enough, this extreme, and indeed quite rational, non market solution has been envisaged by James Meade in a growth context, whenever the warranted growth rate exceeded the natural one (Meade, 1962). For Meade this represented the prerequisite to maintain full employment overtime under the assumption of fixed income shares and strict complementarity of equipment and labor.

If x is not greater than unity the truncation of the stock of capital involves institutional arrangements, but it does not constitute a problem from a structural point of view. Yet, as

can be verified by inserting the value of u^*_i into equation (8), a value of x equal to unity may not guarantee full employment. That is: the full capacity stock of capital in the consumption goods sector may not be enough to absorb the labor force which ought to be transferred from the capital goods sector. Hence, even if the utilized part of the capital stock is in equilibrium with the labor force, its sectoral composition is not. This means that x ought to be greater than unity involving a net addition of equipment to the consumption goods sector. The chances for x to be greater than unity are stronger the greater the difference between the initial values of $-[u_i - u_c]$. In other words, the higher the rate of utilization in the consumption good sector vis a vis the capital goods sector, the smaller the room for an equilibrium transfer of labor within the given stock of capital. In physical terms, this means that there is not enough equipment in the consumption goods sector to provide employment for the workers coming from the investment industries, although total equipment is more than sufficient for full employment purposes.

Using Malinvaud's terminology, the ensuing unemployment would be neither classical nor Keynesian but purely sectoral. The appropriate strategies would consist in how to combine a positive net output of investment goods with unused capacity. In fact, if the computed u^*_i implies $x > 1$ more machinery has to be produced for the consumption goods sector. As a consequence the actually planned rate of capacity utilization in the capital goods sector will have to be higher than that ensuring the simple reproduction of the equilibrium stock of capital given by u^*_i . The net output of machinery will be allocated in the consumption goods sector until the stock of capital there reaches the level $x(1-m)K$. After that moment the rate of utilization should be brought down to the value u^*_i truncating at the same time the stock of capital. The more complex the sectoral structure of the economy the more complicated is the transitional phase.

The process of maintaining full employment whenever $y > \beta L$, seems to require a system of investment planning rather than demand management. In particular, if truncation of productive capacity is institutionally feasible, there can be a number of intermediate utilization rates to be aimed at. These depend on the number of sectors in the economy, on the way in which they are dovetailed and on the initial relative utilization rates. The larger the number of sectors the more complex is the planning process, but it is also all the more necessary since the discontinuities highlighted in a simple two sector framework are amplified in a more sophisticated industrial apparatus.

Very little has been said about prices in this context. The price relation in the consumption goods sector is governed by the hypothesis that workers consume all their incomes and that capitalists consumption can be neglected. On this basis the unit price of consumption goods is given from equation (4).

$$(9) \quad p = w[u_i m + u_c(1-m)]/u_c b(1-m)$$

Consumption goods prices and wages follow from the planned rate of utilization in the capital goods sector. This planned rate may well be the intermediate rate if it does not allow for an equilibrium transfer of labor. Once the former is set, the utilization rate in the consumption goods sector is determined and to this there must correspond a definite price-wage relation. Prices and wages are flexible in the way Kalecki understood them to be in a socialist centrally planned economy. The prices of capital goods follow from the share of investment goods output that goes to the consumption goods sector and the money wage. A two sector model is nothing more than a variant of Marx's schemes of reproduction. This means that the value of the share of investment goods sold to the consumption goods sector is equal to the wage bill in the capital goods sector. If this share is h , we have:

$$(10) \quad p_i u_i a m h K = w L_i; \text{ where } p_i \text{ is the unit price of capital goods produced,}$$

u_i can be any given operating rate and L_i is the corresponding level of employment in the capital goods sector.

L_i can be expressed in terms of the capital stock in the investment goods sector multiplied by the operating rate so that equation (10) becomes:

$$(11) \quad p_i = w/ah$$

Capacity utilization rates enter in the price equation of the consumption good but not in that of the capital good. The choice of a certain rate of utilization in the capital goods sector, will be made with the objective of achieving a certain value of h (as indeed it is the case for equation (6)). This will in turn give rise to a certain degree of utilization in the consumption goods sector, which will have to be consistent with a definite relation between the unit price of consumption goods and the money wage. At this point the unit price of capital goods is also determined. It does not matter whether the required price wage relations are obtained via money wage flexibility or with either the price of consumption goods, or the money wage (not both) being fixed at some initial value. What is important here is the ability to control the utilization rate in the capital goods sector in tandem with the control over the sectoral distribution of investment goods. It is not even essential to control the production of consumption goods since it will adjust to the demand generated by workers' incomes. The crucial lever in this exercise is the capital goods sector since it contains the two variables which condition the rest of the economy: the degree of utilization u_i and the allocation coefficient h .

4. The conceptual importance of $y > \beta L$ in relation to Marx

While Malinvaud should be given the credit of having explicitly set up the conditions regulating the pattern of unemployment in the case of productive capacity being too high, he fails to articulate the concrete significance of that eventuality. By changing the perspective from the question of unemployment to the question of how to maintain full employment I have tried to show that the ex ante planning of the structural proportion of the economy acquires dominance over demand management policies. The structuralist approach - major proponents of which were Marxist scholars like Maurice Dobb and Paul Baran - has been extensively applied to planning problems in developing economies, yet, with the notable exception of Adolph Lowe (1976), it did not receive full appreciation when it came to discussing issues concerning capital formation in mature economies.

In this context the dialogue, sometimes implicit (Harrod, 1939) sometimes open (Robinson, Kaldor, Morishima), between Marxian and Keynesian themes established by a number of prominent thinkers, has helped to unveil a situation in which the productive capacity of the economy has outgrown the productive power of labor, i.e. $y > \beta L$. For Malinvaud this is purely a logical, therefore reversible, possibility. As such it is a hypothesis as good as any other. But if it is accepted that a given conceptualization mirrors in some way an objective reality, the question arises of whether or not it represents a systemic transformation of the pattern of accumulation. If this is so, advanced capitalist economies are likely to be more subject to the Harrodian contradiction - expressed by the warranted rate of growth exceeding the natural one - than to the Marxian cyclical mechanism based on the Reserve Army of labor.

In Marx the problem of productive capacity being greater than the productive power of labour ($y > \beta L$) does not arise as a crucial source of unemployment and crisis. The whole concept of unemployment is in Marx functionally related to accumulation. The Reserve Army of labor is the factor which allows growth to be regenerated on a larger technical basis after each cyclical downturn. The fundamental reason why $y > \beta L$ is not a major issue in Marx, lies in that income distribution fluctuates along with the cycle. In Marx the growing productive power of industry takes the form of accumulation overtaking the natural supply of labor, leading to a rise in real wages and to a profit squeeze. The crisis is therefore a matter of falling profitability in the wake of a tight labor market, which causes a shift in the distribution of income from profits to wages. Classical competition, leading to a uniform rate of profit, is the force which sustains the above process. As a consequence the problem of

excess capacity is not a structural one, but it is a transient phenomenon appearing only during cyclical downswings.

In Harrod the view that in advanced economies the warranted growth rate is likely to exceed the natural rate, implies a crisis in the rate of accumulation which cannot be solved in a manner endogenous to the economic system. Hence, Harrod spoke of a chronic depression, while Marx strongly denied that a permanent crisis could exist under capitalism. The framework chosen by Malinvaud is nothing but a Harrodian one with no natural growth. But how can an economy attain a position where $y > \beta L$? If we start from a Walrasian dimension we will not be capable of envisaging the possible answers. Yet as soon as we go back to Marx's framework we can understand the reasons bringing the economy to a Harrodian stage of structural maturity. These reasons are to be found in the weakening of the forces which govern the classical competitive business cycle, in particular the forces which regulate the distribution of income during the phases of the cycle. It follows that the Harrodian contradiction may express a new aspect of the limits to capitalist accumulation, limits due to the historical transformation of the economy.

Footnote

- (1) The deterministic elements inherent in machine based systems were fully understood by Marx in the chapter on machinery in Volume One of Capital. He argued that only when output is produced by means of machines connected through definite technical relations, can production be studied scientifically (Marx, 1974,1,ch.15).

BIBLIOGRAPHY

- Halevi, J. (1981) "The Composition of Investment under Conditions of non Uniform Changes". *Banca Nazionale del Lavoro, Quarterly Review*, June.
- Halevi, J. (1987) "Investment Planning". *The New Palgrave: A Dictionary of Economics*, Eatwell, J., Milgate, M., Newman, P., editors. London, Macmillan.
- Harrod, R. (1939) "An Essay in Dynamic Theory". *The Economic Journal*, Volume 49.
- Hicks, J. (1965) *Capital and Growth*. Oxford, Oxford University Press.
- Kaldor, N. (1938) "Stability and Full Employment". *The Economic Journal*, Volume 48.
- Kaldor, N. (1956) "Alternative Theories of Distribution". *Review of Economic Studies*, Volume 23.
- Kalecki, M. (1954) *Theory of Economic Dynamics*. London, G. Allen & Unwin.
- Kalecki, M. (1976) *Essays on Developing Economies*. Hassocks, Harvester Press.
- Lowe, A. (1976) *The Path of Economic Growth*. New York, Cambridge University Press.
- Malinvaud, E. (1980) *Profitability and Unemployment*. Cambridge University Press.
- Marx, K. (1974) *Capital*, Vol.1. Moscow, Progress Publishers.
- Meade, J. (1962) *A Neoclassical Theory of Economic Growth*. London, G. Allen & Unwin.
- Morishima, M.(1968)*Theory of Economic Growth*. Oxford, Oxford University Press.
- Robinson, J. (1956) *The Accumulation of Capital*. London, Macmillan.
- Rosenberg, N.(1976)*Perspectives on Technology*. New York, Cambridge University Press.
- Sweezy, P. (1953) "A Crucial Difference between Capitalism and Socialism". In: *The Present as History*. New York, Monthly Review Press.
- Vatter, H. (1985) *The US Economy in Word War II*. New York, Columbia University Press.