Some critical appraisals on the profit-led models of growth

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"Now capitalists do many things as a class, but they certainly do not invest as a class"

Michal Kalecki, 1967.

Abstract: Este paper apunta al análisis crítico de algunos modelos Neo-Marxistas de crecimiento, que establecen una conexión directa entre la distribución del ingreso y el crecimiento económico, expresando a la inversión como una función de las ganancias normales. Nuestro análisis subraya algunas falencias de estos modelos de crecimiento por ganancias, como el hecho que estos ignoran el efecto capacidad de la inversión y el supuesto que una capacidad adicional creada por ellos será sancionada por otros componentes de la demanda agregada, lo que aparece como pasivo en estos modelos. En otras palabras, la Ley de Say está presente implícitamente en algunas versiones de los modelos de crecimiento marxistas. Otros problemas son que estos modelos son inestables cuando se consideran otros componentes de la demanda autónoma distintos de la inversión.

En este enfoque, también observamos que en estos modelos la tasa de utilización de la capacidad productiva en el largo plazo no tiende a una normal utilización de la capacidad. Proponemos que no existe ninguna restricción ni conexión necesaria entre ganancias y crecimiento. Cuando la producción real satisface un piso mínimo de la tasa de ganancia, el crecimiento y la inversión solo dependen de la expansión de la demanda agregada.

Abstract: This paper[3] aims to analyze critically some Neo-Marxist models of growth, which establish a direct connection between income distribution and economic growth expressing investment as a function of normal profits. Our analysis points out some handicaps of these profit-led growth models, as the fact that they ignore the capacity effect of investment and the assumption that the additional capacity created by them will be sanctioned by the other components of aggregate demand, which seem to appear passive in these models. In other words, Say's Law is implicitly present in some versions of the Marxist theory of growth.

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3 This paper is part of the Dissertation "A Sraffian analysis of the Steindlian-Kaleckian models of growth and distribution" defended in 2007 by Cardoso and oriented by Professor Dr. Serrano. As usual, the opinions expressed on the paper are exclusively the point of view of the authors.

Another difficulty of these models is that they are unstable when other of autonomous expenses, different than investments, are considered. In this approach, we also observe that in these models the rate of capacity utilization in the long run does not tend to the normal rate of capacity utilization. We propose that there is not any strict and necessary connection between profits and growth. When the actual production satisfies a minimum floor for the rate of profit, growth and investment depend only on the expansion of aggregate demand.

Palabras Clave: profit-led growth, neomarxistas,

Códigos JEL: E11, E12, E22,

1. Introduction

This paper investigates the fundamentals that explain the inverse relation between growth and the distribution of income in favor of workers in Neo-Marxist models. This relation is expressed in these models through the use of an investment function that has the normal rate of profits as its argument. The Neo-Marxist models, usually known in the literature as profit-led models, are analyzed in the first section in terms of their investment function and its problems to generate a profit-led regime. The second section investigates the consequences of inserting autonomous demand expenditures in these models what usually make their rate of capacity utilization to diverge from the normal one. The fourth section makes some scenarios of the Neo-Marxist models, showing some strange results of them, as the continuous process of investment even when the effective rate of profit and the rate of capacity utilization are going down for several periods of time. The fifth and final section makes some concluding remarks.

2. Profits, Investment and Autonomous Expenditures

In the Marxist literature the usual scheme $D - M - D'$ represents the way the individual capitalist thinks the process of capital accumulation. Suppose, as an example, that a capitalist in moment 't' advances 20 monetary unities, of which 10 are spent in means of production. We will call this expenditure as 'constant capital' (CC), produced in the previous period. This transaction appears in the final price of production. The other 10 monetary unities are spent in salaries. We call this transaction as 'variable capital' (CV). The capitalist, in our example, sells the final product for 30 monetary unities:

$D - M - D'$:

$$D = 20 = M\{10 = CC, 10 = CV\} - D' = 30$$

The difference between D and D' is the 'surplus-value' ($D' - D = 10$). The final value of the product is 30 monetary unities. The value added is equal to 20 unities. Since the capitalist advanced only 20 unities, where does the extra purchasing power (10 unities) come from in order to sell the final product for 30 unities? In this economy, workers received 10 unities as wages and 10 other unities were spent to pay for the means of production produced in the previous period. From where comes the extra 10 units of money to pay for the added value? How can the production be increased in period t+1 in the absence of some kind of autonomous expenditure?

In aggregate terms, there must be credit, an increase of public expenditure financed by new means of payments, or some other source of independent expenditure. Current income cannot finance the expansion of its own. With a sum X, it is impossible to finance an increase of the type $X + DX$. In a model of the type corn-corn, without transactions, corn pays itself. In other words, in a model with only one product there is no difference between supply and demand. But, in a monetary economy, the products must be bought, which means that supply and demand are separated. In this sense, any real expansion (of supply) must be accompanied (or preceded by) an expansion of demand. And no matter the income size in period t, it is impossible for it to finance itself in period $t + 1$.

In Marxist terms, we can say that the labour-value (V) of every commodity we have part of it corresponding to CC, CV and PV:

$$V = CC + CV + PL$$

The added value is:

$$VA = CV + PL$$

No matter the destiny of PL, including that of CV. The sum of both components cannot surpass the current level of the VA. Credit is logically inevitable whenever in real life such deflationary mechanisms as the Pigou Effect or the Keynes effect do not work[4]. In this way, the problem to be discussed in the profit-led models is not how profits finance investment. This cannot be the center of the discussion since profits (PL) can never logically finance its expansion in period $t + 1$. It is necessary to include credit in the analysis. The key to the Neo-Marxian models is to justify some sort of mechanism by which the normal rate of profit positively influences investment, even though total inversion is in fact financed by an *ex nihilo* credit.

3. The Neo-Marxian Investment Function

One of the main problems identified by the Neo-Marxist authors in the traditional Steindlian-Kaleckian investment function is the use of the effective rate of profits together with the rate of capacity utilization as its determinants. This problem is related to the fact that the canonical version of this model had a problem of specification that generated only wage-led growth models. This is related to the double consideration of the expansive effect of an eventual increase of the real wage over the rate of utilization. To see this, consider the canonical investment function:

$$I = f(g_a; u; r)$$

The double entry is clear from the equation above, since an increase of real wages stimulates investments directly through a greater rate of capacity utilization ($\partial u / \partial w > 0$) and indirectly through the effective rate of profits:$r = u(1 - w)R$. So, the expansive effect of an increase in

[4] Serr Serrano and Ribeiro (2004).

real wages more than compensates the depressive effect of the reduction of the mass of profits[5].

In order to correct this problem of specification and to reestablish the Marxist inverse relation between growth and income distribution in favor of wages, the Neo-Marxist model proposes the use of the normal rate of profit (r_n), instead of the effective one, as the determinant of their investment function[6]. In this model, an increase of the real wage reduces the normal rate of profit and, as a result, reduces the level investment and the growth rate of the economic system. This kind of investment function can be seen in the equation below:

$$1)\ \frac{I}{K} = hr_n \qquad h > 0$$

This function can be represented also as:

$$2)\ \frac{I}{K} = h(1-\omega)R$$

Where ω is the share of total wages in total income ($\omega = W/Y$); R is the maximum rate of profit[7], defined as total normal income divided by the stock of capital ($R = Y^*/K$); h is the normal rate of profit elasticity of investment; K is the stock of capital.

In order to investigate the effect of this specification of the investment function on the level and the growth rate of income, let us introduce the multiplier. We are assuming a simplifying

5 For more details, see Cardoso, 2007.
6 See Bhaduri and Marglin (1990).
7 The relation between normal income and the stock of capital is a technical data which we assume as a parameter because we are not considering technical changes.

hypothesis that all wages are consumed[8], all profits are saved and that the depreciation rate of the capital stock is zero[9]:

$$4)\ Y = I/(1-\omega)$$

Substituting equation 2 in equation 4:

$$5)\ Y = \frac{[h(1-\omega)RK]}{(1-\omega)} = hRK$$

In these conditions the product will be neither profit-led nor wage-led. In fact, according to this investment function, the level of income is independent of any hypothesis about its distribution. No matter how high is the normal rate of profit-elasticity of investment (h), the level of income cannot in any way be profit-led or wage-led. If we introduce an additional component in the investment function independent of the rate of profit (g_a), the equation appears as this one:

$$6)\ I/K = g_a + h(1-\omega)R.$$

The main results remain the same, i.e., the level of income is not pushed by the normal rate of profit. At the contrary, investment will be positively related to the share of wages in total income. Introducing this equation in the multiplier, this conclusion becomes clear:

8 We are not considering chances in the technical conditions of the economy. For this reason, we can use the real wage or the share of wages in total income indistinctly as the same variable in order to infer changes in the normal rate of profit.

9 So, total consumption (C) is equal to the mass of total wages (W), and total saving (S) is equal to the mass of total profits (P). Neither or these simplifying hypotheses are necessaries for the conclusions.

7) $Y = \frac{g_a K}{(1-\omega)} + hRK$

It is possible to ask if this result would change if a non linear investment function were considered. Take the following example:

8) $\frac{I}{K} = h[(1-w)R]^{\varphi}$

Where $\varphi \neq 1$. Inserting equation 8 in the multiplier again, we have:

9) $Y = I/(1-w) = h(1-w)^{\varphi-1}R^{\varphi}K$

In this case, the effect of distributional changes on the level of income is ambiguous, depending of the value of φ. Only when $\varphi > 1$, the level of income will be profit-led, and the opposite, when $\varphi < 1$ the system will be wage-led. Even in this case, if we consider other autonomous expenditures, the ambiguity is still present:

$$Y = \frac{g_a K}{(1-\omega)} + h(1-w)^{\varphi-1}R^{\varphi}K$$

On the one hand, the first term of the equation shows a negative relation between the share of profit and the level of income. On the other hand, the second term shows a positive relation when $\varphi > 1$. In economic terms, this means the positive effect on investment because of the redistribution in favor of profits should exceed the negative effect on consumption. Either way, there is no economic reason to represent the investment function as a nonlinear relationship between distributive variables and volume of investment.

4. Considering other autonomous components of expenditures in aggregate income: the Neo-Marxian razor edge

In order to identify one of the specification problems in the Neo-Marxist models, let us consider some possible reactions of the investment function to an increase of the normal rate of profit. We wonder why capitalists would necessarily decide to increase investments when salaries are being reduced, once the resulting aggregate demand almost certainly is not growing at the same rate of the augmented capacity.

Marglin and Bhaduri's proposal to use the normal rate of profit as one of the arguments of the investment function completely ignores that investment crates productive capacity and that it must be utilized, i.e., there must be effective demand to use the additional investment. In the capitalist system there is always a minimum rate of profit below which capitalists would not be willing to invest. However, from this latter proposition, one should not conclude that there is a functional relation, direct or indirect, between the normal rate of profit and the capitalist's decision to invest.

Other problem in Neo-Marxist models of growth and distribution is the fact that the rate of capacity utilization is the adjusting variable which absorbs any disequilibrium between demand and supply. This becomes a problem because in this model there is no mechanism which guarantees that the capacity utilization in the long run will gravitate towards its normal or desired level. Consequently, in the Neo-Marxist models the more probable result is to observe a rate of capacity utilization different than the normal in the long run.

Let us analyze now what happens to the rate of capacity utilization when some autonomous demand component, different from investment, are inserted in Neo-Marxian growth model. Consider, as a matter of simplification, a closed economy without government expenses. In this overly simplified economy there are three types of expenditure: induced consumption, investment and consumption financed by credit, called 'Z':

$$Y = C + I + Z$$

It is important to note that, differently from investment, the component Z does not add productive capacity, what makes it an unproductive autonomous expenditure. By contrast, investment is a productive expenditure. Now, consider that the national income grows as a simple arithmetic average of induced consumption, investment and autonomous expenditures. Then, we have:

$$g_y = \alpha g_c + \beta g_i + \gamma g_z$$

Where, $\alpha = \frac{C}{Y}, \beta = \frac{I}{Y}, \gamma = \frac{Z}{Y}$, consequently $\alpha + \beta + \gamma = 1$; g_y is the growth rate of total income; g_c is the growth rate of induced consumption; g_i is the growth rate of investment; g_z is the growth rate of autonomous expenditures.

In order to analyze the impact of unproductive expenditures, let us consider, to simplify our example, that we have the initial following values for the parameters of the rates of growth: $\alpha = \beta = \gamma = 1/3$. Suppose also that $g_z = 3$, $g_i = 4$ and $g_c = 3{,}5$. A very simple math shows that in the next period income will grow at $3{,}5$ ($g_y = 3{,}5$). The implication of this result is clear: there is a continuous divergence between the rate of growth of aggregate demand (g_y) and the rate of growth of productive capacity (g_i). This is obvious when we notice that the productive capacity grows at 4, equal to the rate of growth of investment, and aggregate demand grows at $3{,}5$. As investment responds only to profitability and evolves independently from the aggregate level of income, there is a chronic underutilization of the productive capacity.

In this case, the rate of utilization will tend to stabilize to a certain level which corresponds to the curious situation in which investment becomes the only relevant component of autonomous expenditures. In this case, i.e., when the share of the other autonomous expenditures in total income tend asymptotically to zero ($\gamma \to 0$), aggregate income is increasing at the same rate of investment once the share of induced consumption is fixed ($\alpha = constant$). In these conditions, the level of capacity utilization would stabilize asymptotically at a level different from the normal.

The Neo-Marxian growth model don not explode when a rare and coincidental arrangement occurs: both, investment and the other autonomous components of aggregate demand are

growing at the same rates ($g_z = g_i$). Some authors propose a curious solution to achieve Neo-Marxist with a stable utilization of the productive capacity. This possibility was brought by Lima and Carvalho (2006) and Blecker (2002, p. 143), who proposed the insertion of compensating unproductive expenditures in order to balance the disproportions between the installed productive capacity and the aggregate demand. In this way, they guarantee that the rate of capacity utilization does not explode.

Notwithstanding the innovative character of the proposal when considered from a formal point of view, there is no plausible economic justification for any unproductive expenditure, be it government expenditures, consumption financed by credit or net exports, to grow at the exact degree which guarantee that aggregate demand will be modified at the same rate of the installed capacity. Apparently, the insertion of autonomous expenditures in this way seems to be a minor and innocent specification, but it is not. With this treatment these expenditures can no longer be considered as real autonomous expenditures, since in fact they become endogenous in the model.

5. A model in which capitalists do not consider the effective rate of profit

Perhaps, the main problem that upsets the profit-led growth models, in which there is a negative relation between the share of wages in total income and growth, in spite of their most common explicit assertions[10], is that they do not pay attention to the mass of profits, or even in some cases ignore the effective rate of profit, as a key determinant of investments. As was seen in the previous section, in the presence of any autonomous expenditure that grows at a different rate from investment, the rate of utilization of productive capacity will diverge from the normal one. In this case, every individual capitalist do not maximize its mass of profits. When a capitalist underutilizes his productive capacity he is wasting opportunities to raise profits and is also working with an effective rate of profit less than that which would be achievable using it at its normal level.

In this case, even in the very improbable case in which the whole system appears as profit-led, the Kalecki's famous statement applies: "capitalists do many things as a class, but they certainly do not invest as a class". In the Neo-Marxist models there exists a contradiction between the interest of the capitalist class as whole and that of the individual capitalist. However, the

10 See Shaikh (2004).

Marxists do not recognize this problem maybe because they consider a type of 'representative capitalist agent', who invests considering only the trajectory of the normal rate of profits and nothing else, such as the effective rate of profit or the rate of capacity utilization which drops for several periods in theirs models. May be, for the former, the 'representative capitalist agent', investing in relation to the normal rate of profit could be a good suggestion. But for an individual capitalist, investing according to the demand path appears as the most profitable solution, because can accommodate the additional demand through a higher use of his productive capacity, not through new investments. This incentive works and is present for every individual capitalist. So, if there are 'free capitalist riders', profit-led growth model prediction will be wrong, even in the most favorable conditions.

In this case we have two possibilities:

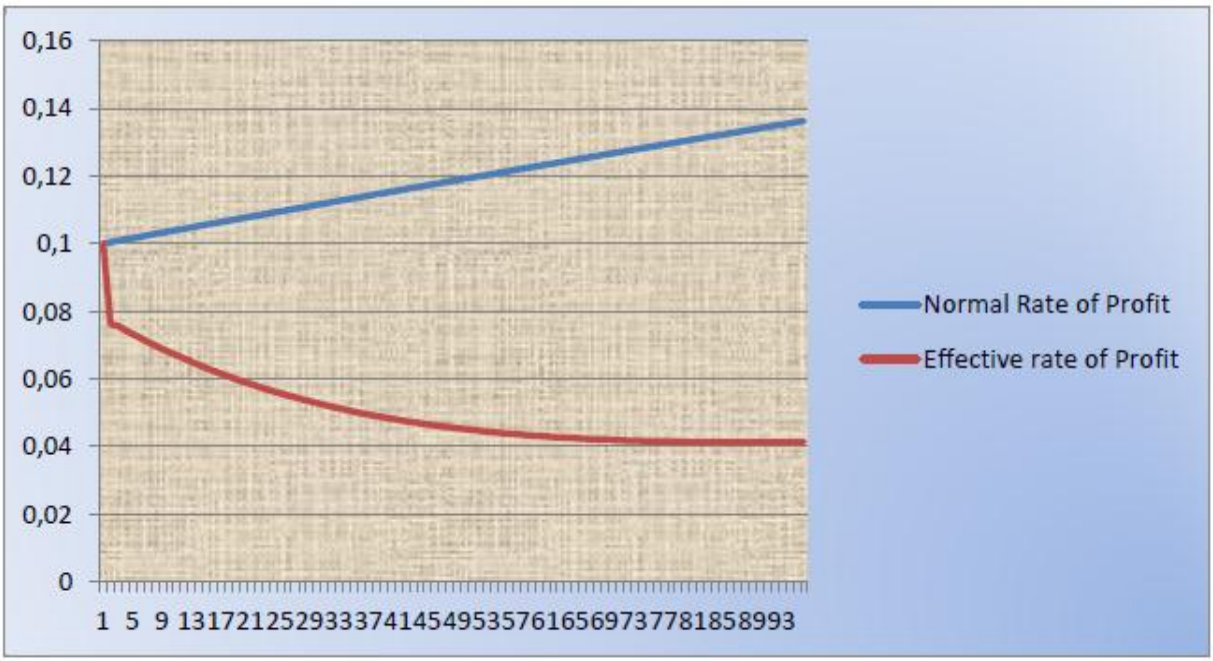
a) When the productive capacity of the whole industry is underutilized, the individual capitalist will get a higher mass of profits and a higher effective rate of profits than the average or 'representative' capitalist when he adjusts his investments decisions in order to obtain a normal rate of capacity utilization, contrary to the profit-led models predictions.

b) When the productive capacity of the whole industry is overused, the individual capitalist will get a higher mass of profits but a minor effective rate of profit than the average or 'representative' capitalist when he adjusts his investments decisions in order to obtain a normal rate of capacity utilization, contrary to the profit-led models predictions.

In any case, the individual capitalist who break the profit-led model rule will get more profits than the others. In graph 1 we plot a numerical example comparing the normal versus the effective rate of profit when underutilization of the productive capacity prevails. The first, the normal one, correspond to a normal use of the productive capacity. The second, the effective, correspond to the effective rate of utilization. It is obvious that in presence of underutilization the first one will be higher than the second. In this case, because of the normal rate of profit is a rising function, following the profit-led model prediction, investment increases and the underutilization of capacity continuous indefinitely. If we suppose that aggregate effective

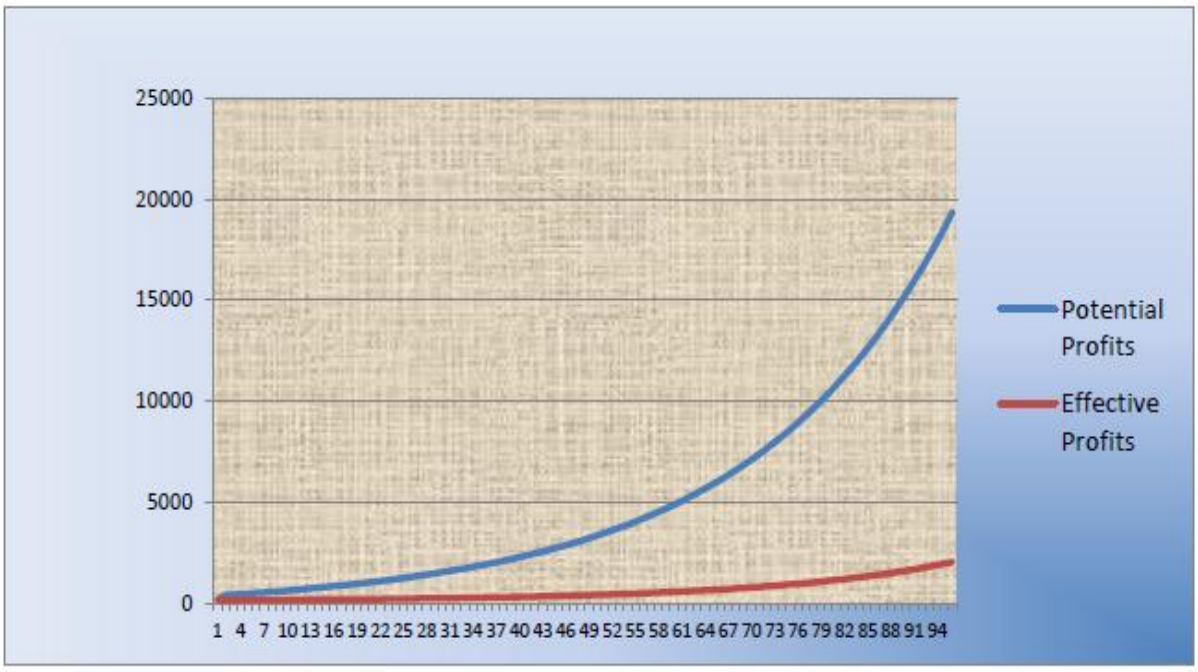
demand is divided by the number of firms proportionately, every individual capitalist will gain a higher rate of profit if he stops investing, and adjusts his productive capacity to demand, taking advantage of the increasing demand generated by the other capitalists.

Graph 1



In graph 2, we plot the same numerical example comparing the potential mass of profits, corresponding to an eventual normal use of the productive capacity, with the effective mass of profits, which corresponds to the effective use of productive capacity. Every individual capitalist will face a situation like this, if he follows the investment rule suggested by the profit-led model.

Graph 2



In order for us to reinforce this point, let us consider some of Kalecki's equations. Excluding government and the external sector as a matter of simplification, we can assume that income (Y) is divided between consumption (C) and investment (I), as shown in the equation below:

$$Y = C + I = W + P$$

As well know, and to simplify our example, consider that income is made up only between salaries (W) and profits (P). Following Kalecki, we can split consumption into that of capitalists (C_K) and that of workers (C_w). Then we can rewrite the equation above in this way:

$$C_w + C_K + I = W + P$$

Suppose, to simplify again, that workers consume all their income ($C_w = W$) and capitalists save all theirs ($C_K = 0$). If we consider this, Kalecki's equation becomes:

$$I = P$$

The above equation tells us that capitalists earns depend only on what that invest, following Kalecki. In other words, the mass of profits grows together with investment. It is valid in aggregate terms. However, this reflection makes us wonder if it is a rational supposition in terms of the individual capitalist. To analyze this, let us make three hypotheses:

(1) Suppose that the rate of capacity utilization of all capitalists is underused;

(2) suppose also that the investment of an individual capitalist is marginal in relation to total income;

(3) Finally consider that the multiplier of investment of every individual expending is more or less proportionally distributed as additional demand (and income) to all capitalists. For example, if only one capitalist spends US$ 1 million as investment, the proportional income that he receives in return is marginal, since he cannot directly demand himself.

If we consider the three hypotheses above, we can assume that if one capitalist keeps investing disproportionately in relation to his demand, he will earn less mass of profits and a minor effective rate of profits than the capitalist that simply accommodates his investment decisions to the flow of demand.

Conclusions

One of the main conclusions of this article is that the inverse relation between growth and distribution of total income is not well grounded and sustained in the Neo-Marxist models. This conclusion comes from the fact that linear investment functions that use the normal rate of profit as their argument are neither profit nor wage-led. That model tries to reestablish this relation by means of inserting a non-linear investment function, however there is no economic reason for that.

The history of capitalism shows that there is in fact no relation between income distribution and economic growth. In some moments economic growth has been accompanied by a distribution favorable for workers and by an increase of their share in total income as in the Golden Age (1945-1973) and in other moments growth coincides with a process of distribution in favor of capitalists, as, for example, the case of Brazil in the 1970´s or the US in the 1990's.

In the Neo-Marxist models the additional capacity created by investment probable does not have a correspondent increase of demand. This is not a problem if one supposes the validity of Say's Law or if one avoids the problem through the introduction of autonomous expenditures other than investment. However, as seen on the paper, the Neo-Marxist models are incapable of introducing this type of expenditures because in their models the rate of capacity utilization tends to diverge from the normal one. In other words, the productive expenditures 'rule' the unproductive ones, not the other way around.

We can conclude from the many possible ways alluded above that there is no direct and well defined relation between investment and the normal rate of profit. What is for sure is that one can never forget that investment is a type of demand expenditure that is different from all the others since it adds capacity and that the companies are not going to expand if there are not clear possibilities to use the additional capacity. In other words, investment must be induced by demand growth, which as pointed out by Serrano (1996), is a result of the growth of autonomous expenditures that do not create additional capacity, as we mentioned above and it is also in accordance to Kalecki's and Keynes's writings, what would guarantee that the rate of capacity utilization gravitates around its normal level.

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