THE CAPACITY UTILIZATION CONTROVERSY IN THE LONG-RUN

Reaction Paper 2

Duménil and Lévy (1999) and Freitas and Serrano (2015)

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The issue of this paper is the controversy around the utilization rate and its role in the heterodox literature. We will discuss the implications of the Kaleckian model and then address the criticisms from two standpoints: The Neo-Ricardian critiques and the Classical/Marxian.

We first use Fagundes and Freitas (2017), Serrano and Freitas (2017), Lavoie (1995) and some class notes to summarize the canonical Kaleckian results. What emerges as a contending point is the role of the rate of the capacity utilization, because in the Kaleckian baseline model the capacity varies as the closure of the model and due to it, it is not necessary that this variable reaches the normal/planned level. The critique from the Sraffian/Neo-Ricardian standpoint arises from the Supermultiplier model in which the normal capacity is the result in a model with existence of the autonomous expenditures that do not generate capacity. The Classical/Marxian critique will be discussed from Duménil and Lévy synthesis attempt. In their discussion the traverse model explains the difference between short and long run and in the latter the variables adjust to their normal levels due to the equalization of the profit rate and the existence of the prices of production. The monetary variables will help to stabilize the model to the normal levels.

The canonical Kaleckian model starting point is that the distribution is exogenous, and the consumption habits are given. The model delivers a wage-led growth due to its roots in the principle of effective demand and the setup of the model. To show the relations we start with the consumption function which presents workers and capitalists consumption: \( C = C_W + C_K = c_w \omega Y + c_K \pi Y \) where the income shares are \( Y = R + W \rightarrow 1 = \omega + \pi \). Then, because the workers are hand-to-mouth \( (c_w = 1) \) the aggregate demand in a closed economy\(^1\) \( D = C + I \rightarrow D = (\omega Y + c_K \pi Y) + I \). In equilibrium, \( Y = D \rightarrow Y[1 - (\omega + c_K(1 - \omega))] = I \rightarrow Y^* = \left( \frac{1}{s_K(1-\omega)} \right) I. \) Because we modelled the exogenous investment, the growth rate in the steady-state is the investment exogenous growth rate: \( g^* = g_I \). To find a functional relation to \( I/Y \), consider \( Y = C + I \rightarrow 1 = \frac{C}{Y^*} + \frac{I}{Y^*} \rightarrow \frac{I}{Y^*} = 1 - \frac{(\omega + c_K(1-\omega))Y^*}{Y^*} \rightarrow \frac{I}{Y^*} = s_K \pi \). Observing the accounting identity \( I = S \rightarrow \frac{I}{Y^*} = s_K \pi \rightarrow \frac{S}{Y^*} \). Now, the accumulation rate comes from a standard capital accumulation function \( \dot{K} = I \rightarrow \dot{K} = \frac{I}{K} \rightarrow g_K = \frac{I}{K} \rightarrow g_Y = \frac{Y}{K} \). Defining the utilization rate as \( u = \frac{Y}{K} \) and the potential output to capital as \( \frac{1}{v} = \frac{Y_Y}{K} \) we can rewrite \( g_K = \left( \frac{1/v}{v} \right) u \). The growth rates are \( \dot{u} = u(g - g_{Y_Y}) \) and \( \dot{v} = v(g_K - g_{Y_Y}) \). In steady-state \( \dot{v} = 0 \rightarrow \frac{\dot{u}}{u} = (g_1 - g_K) \rightarrow \dot{u} = u \left( g_1 - \frac{l/y}{v} u \right) \). Substituting \( \frac{l}{y} \). 

\(^1\) We choose to use an exogenous investment function here to simplify the notation and because there is no qualitative difference to our discussion. Also, we are neglecting the depreciation in this paper.
we have \( g'_k = g_f = \left( \frac{sK_\pi}{\nu} \right) u^* \). Here the utilization rate needs to vary to make the accumulation rate to converge to the growth of investment. Also, when we isolate \( u^* \) we have \( u^* = \frac{\nu g_f}{sK_\pi} \) and because of all variables are given, the utilization rate varies to close the model and it is then meaningless to discuss the normal rate of utilization as a closure in the kaleckian baseline-model.

The Sraffian critique started with Serrano’s (1995) dissertation which was much more developed more recently. Using Serrano and Freitas (2015) and some class notes we can present the model as follows: differently from the Kaleckian traditional model, the distribution is defined in the core of the economy à la Garegnani and the Classical notion of competition assures the equalization of the profit rate and the prices of production simultaneously\(^2\). The Sraffian Supermultiplier (SM) relies upon in the micro-level in the Sraffa’s (1960) developments and in the macro-level relies on the principle of effective demand à la Kalecki. The SSM model conciliates the demand-led growth along with exogenous distribution and normal utilization through the variation of the endogenization of the saving rate. As in the Classics, given the technique, the distribution is exogenous. Consumption summarizes capitalists and workers expenditures but now we add the variable \( Z \), which is an autonomous component (with exogenous growth rate) financed by credit and not related to the output level. Hence, consumption is expresses by the Average consumption function \( C = C_W + C_\pi \) in which the capitalist consumption is totally autonomous: \( C_W = \omega Y \) and \( C_\pi = Z \). Making the investment rate equals to \( I = hY \) the aggregate demand is \( D = \omega Y + Z + hY \). The equilibrium between supply and demand gives us the SSM equation: \( Y = D \rightarrow Y = \omega Y + Z + hY \rightarrow Y^* = \left( \frac{1}{s-h} \right) Z \), where \( \left( \frac{1}{s-h} \right) \) is the Supermultiplier\(^3\). In order to explain the endogenous saving-rate and “the fraction” we can do the following: \( Y = C + S \rightarrow S = Y - (\omega Y + Z) \) resulting in \( S = sY - Z \rightarrow \frac{s}{Y} = s - \frac{Z}{Y} \). Then, we have two numbers: the average propensity to save \( \frac{s}{Y} = s - \frac{Z}{Y} \) and the marginal propensity to save \( \left( \frac{\partial s}{\partial Y} = s \right) \). Now we can define “the fraction” \(^4\) \( (f) \) dividing the saving-rate by the marginal propensity to save: \( f = \left( \frac{s}{Y} \right) \). Using the accounting identity \( I = S \) we have \( \frac{s}{Y} = \frac{df}{ds} \rightarrow f = \frac{df}{ds} - \frac{I}{s} = \frac{df}{ds} - \frac{1}{sY} = f = \frac{1}{sY} = \frac{1}{I+Z} \). So we can summarize the relations as \( \frac{s}{Y} = s - \frac{Z}{Y} = sf = \frac{1}{sY} = h \), or more straightforwardly, \( \frac{s}{sY} = f = \frac{1}{I+Z} \). These relationships establish that the marginal propensity to saving \( (s) \) and the costs from the autonomous expenditures \( (Z) \) endogenously determine saving rates \( \left( \frac{s}{Y} \right) \). Therefore, given the exogenous distribution and consumption habits, \( (s) \) is given and the marginal propensity to invest \( (h = \frac{1}{Y}) \)

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\(^2\) The simultaneity of \( r_\pi \) and prices of production holds in Sraffian approach. In the Marxian approach the rate or profit precedes the prices of proction.

\(^3\) Here \( s = 1 - \omega \).

\(^4\) “(...) \( f_t \) is what is called ‘the fraction’ in Serrano (1995b), defined as the ratio of the average to the marginal propensities to save, \( f_t = (S_t/Y_t)/s = I_t/(I_t + Z_t) \). With positive levels of autonomous consumption, it follows that \( f_t < 1 \) and \( S_t/Y_t < s \).” (Serrano e Freitas, 2017, p.73)
determines the economy's saving rate \( \left( \frac{S}{Y} \right) \). The SSM complete adjustment model (long-run) relies upon two relations: the marginal propensity to invest growth rate and the utilization of capacity growth rate \( \frac{\dot{h}}{h} = \gamma (u - u_n) \) and \( \dot{u} = u (g - g_{YP}) \). Following the previous discussion, for a given \( v \), \( g_{YP} = g_K \). The final step is to find the growth rate of the economy which is given by \( D = \omega Y + Z + hY \to Y = D \to Y = \omega Y + Z + hY \). To calculate the growth rate we take the derivative in respect to time and divide by \( Y: \dot{Y} = (1 - \pi)\dot{Y} + \dot{h}Y + h\dot{Y} + \dot{Z} \to (1 - \pi)\dot{Y} + h + \frac{\dot{h}}{\gamma} + \frac{\dot{Z}}{\gamma} \to g = (1 - \pi)g + \dot{h} + hg + \frac{\dot{Z}}{\gamma} \) \( \to g(\pi - h) = z \frac{\dot{Z}}{\gamma} gZ + \dot{h} \). Then \( g = gZ + \frac{\dot{h}}{\pi - h} \) and substituting \( \dot{h} \) we have \( g = gZ + \frac{hy(u - u_n)}{\pi - h} \). We can express \( g_K \) in two ways: \( \frac{k}{K} = \frac{i}{K} = \frac{i}{V} u \to g_K = \frac{h}{v} u \) or substitute \( \frac{i}{V} = \frac{S}{Y} = \frac{3K}{\pi - h} u \). Here we use the same as the authors, the first one. Now the system is complete:

\[ i) \dot{h} = hy (u - u_n); \]
\[ ii) \dot{u} = u \left[ (gZ + \frac{hy(u - u_n)}{\pi - h}) - \left( \frac{h}{v} u \right) \right] \]

The steady-state is characterized by \( \dot{h} = \dot{u} = 0 \), then \( u^* = u_n \) and \( h^* = \frac{(gZ)\nu}{u_n} \). In the long-run equilibrium we have the return of the utilization to the normal level (also, \( r = r_n \) due to the prices of production à la Sraffa) along with a model that has exogenous distribution, demand-led growth and endogenous expenditures which do not create capacity.

Duménil and Lévy (1999) present a synthesis which in the short-term exhibits Keynesian equilibrium and then there is a traverse to a Classical/Marxian long-term equilibrium with normal utilization. They introduce a financing constraint in the investment making the monetary policy the responsible for the closure of the model. They separate the long and short-term variables: in the former, any price, utilization and profit rate exist to assure the equilibrium between supply and demand through utilization, while in the latter is the gravitation of the prices around the prices of production and the equalization of the profit rate that bring the utilization to its normal level. In the Classical/Marxian approach the investment is function of the differentials of profitability due to capital mobility. They add another variable in the investment, a financing constraint that is exogenous in the short-term and endogenous in the long-term. The variation of the prices respond to deviation of

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5 “This endogenous determination of the saving ratio, with a given level of income distribution, is the distinctive feature of the closure provided by the Sraffian supermultiplier growth model”. (Serrano e Freitas, 2017, p.74)

6 It is direct to realize that \( \frac{Z}{Y} = \pi - h \leftrightarrow Z = Y(\pi - h) \leftrightarrow Z = Y(1 - \omega) - I \leftrightarrow Z = Y - \omega Y - I \leftrightarrow Y = \omega Y + Z + I \leftrightarrow Y = C + I \)
utilization as $p_{t+1}^l = p_t^l[1 + \delta(u_t^l - \bar{u}^l)^\gamma$ and the real wage rate is constant. The investment function in the Classical/Marxian thought understands the money (savings) needs to exist prior the investment and then it is the liquid capital\(^8\) what finances investment. Writing the model in terms of the investment rate we have it as function of the profitability differentials $\rho_t^l = \rho + \gamma(r_t^l - \bar{r}_t)$. The dynamics of money normalized by the capital stock (slow variable) responds to the utilization and inflation: $m_{t+1} - m_t = \beta_0(u_t - \bar{u}) - \beta_1j_t$. When there is no inflation, the utilization reaches the normal level through a slow process of gravitation around the production prices. To incorporate the money stock in the investment function we have $\rho_t = \frac{L_t}{k_t} = \frac{L_t}{k_t p_t^l} = \alpha_0 + \alpha_1m_t + \alpha_2u_t$ where $\alpha_0 + \alpha_1m_t$ is the exogenous component in the Kaleckian-Steindlian investment function. Capital mobility and the Classical notion of financial constraint are in line because the idea of moving capital would be meaningless if enterprises could borrow as much as they want without having preliminary funding. They build a two-sector model inspired in the Marxian reproduction schema and show the short-term equilibrium\(^9\) between supply and demand with variable utilization rates and the long-term equilibrium where $u_t = \bar{u}$ and $r^1 = r^2$. So they have a model with exogenous distribution, Keynesian closure for the short-term in which the utilization rate moves to equate supply and demand and a long-term Classical/Marxian closure where through gravitation, the prices of production and the equalization of the profitability ensure the normal utilization level. Also, they solve some unresolved questions within economics: in the short-term (ST) investment determine profits (and saving) while in the long-term (LT) the growth rate is a function of the profit rate; also, in the ST the model is wage-led and in the LT the model is profit-led; finally, savings reduces the utilization in the ST, but diminishes growth in the LT.

The SSM relies upon the existence of the variable $Z$, which is not related to anything in the model to enable stability which reaches the normal utilization level. However, they forcibly create an investment function ($h$) that is vertical in the $u \times h$ space, so the model always necessarily delivers ($u = u_n$). Also, the existence of $Z$ ensures the Keynesian cross to be established, in other words, $Z$ works as the intercept and due the slope of the curves an equilibrium can be reached. The main critique with that approach is that the model is that they buy partially the Classical/Marxian approach when the production prices and the equalization ensure the normal utilization, however, relying in the Okishio Theorem all the results associated with the law of tendency of the rate of profit to fall are avoided in their choice of techniques model. So, they do not consider the investment as a function of any kind of profitability (actual, normal, differentials). To go forward within this literature it would be necessary to develop a better explanation of what effectively is $Z$ and some linkages with economic concepts. Also, is the autonomous expenditure really exogenous in the long-run? Further investigation would be necessary. Criticism regarding the micro level are not discussed here but might be important to their price theory and choice of techniques as well.

Duménil and Lévy’s attempt is quite unique in terms of bridging the Keynesian ST and the Classical/Marxian LT within a formal model. The introduction of the monetary

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\(^7\) This does not imply in market clearing.

\(^8\) $(Monetary \ assets \ held + \ new \ borrowings = liquid \ capital) \rightarrow \text{investment}$

\(^9\) When the long-term variables are given: Prices, capital stocks and Money stock.
variables is done in a good way because here money is not neutral and affects both supply and demand. The critique we could address to them is already in their paper: the stabilizing monetary mechanism is imperfect needing the issuance of money does not respond strongly to deviations in the utilization and the response to inflation must rely within a certain range. Although they are successful because they do not need heroic hypothesis in their model, some qualifications of this function is important. Lavoie and Kriesler (2007) criticize the model showing some similarities with the new consensus with a vertical Philips Curve. Finally, it would be interesting to introduce the financialization process in this schema to try to grasp not only the cooperation but also the conflict between monetary capitalists and productive ones. The introduction of a variable that is related to rentism in the investment function could create divergence in the allocation of money from production to speculation, reducing growth. Other approach would be to calculate the profit rate net of the interest rate as Shaikh (2016) or the profit rate with net worth in the denominator instead the capital stock. The net worth is more accurate to explain the logic of the capital as self-expanding value than the fixed capital stock.

**References**


