# Piketty versus Pasinetti: A Comment on Taylor

Nadia Garbellini and Ariel Luis Wirkierman[1]

## 1. Introduction

In order to use a theoretical framework to interpret real phenomena, two questions need to be made absolutely clear: (1) What is the phenomenon that the framework is intended to investigate? In other words: what question is the framework intended to answer? (2) What is the correspondence between theoretical and empirical magnitudes?

Piketty (2014) employs the usual, neoclassical, growth-theoretical tools in an attempt to explain actual long-run inequality dynamics, from the end of the nineteenth century to the present. However, the attempt is flawed from the very beginning, owing to the fact that the model he has in mind --- whether we like it or not --- is based on theoretical magnitudes whose empirical counterparts are definitely *not* those that Piketty actually takes from the *System of National Accounts* (SNA, hereinafter) (UN, 2009).

In turn, Taylor (2014) criticizes Piketty's 'narrative' on the basis of the underlying theoretical framework (bypassing the above-mentioned 'theory-empirics' inconsistency). He then attempts to extend Pasinetti's (1962) framework, which in his opinion provides a "macroeconomic narrative as unsatisfactory as Piketty's" (Taylor 2014: 12), since the framework *assumes* full employment, on the one hand, and a rate of profit that automatically adjusts to guarantee the maintenance of full employment, on the other. In so doing, Taylor attributes to Pasinetti's framework an objective that is not the one originally envisioned by Pasinetti. In other words, Taylor criticizes the framework based on the fact that it is not suited to answer a question which is *not* the one it was intended to answer.

We can substantiate each of these claims and a series of related issues in turn.

## 2. Equilibrium Conditions versus Accounting Identities

The search for equilibrium conditions of steady growth has been a task of economic theory for a long time. The aim is a normative one: which properties should a system on a steady growth path possess? Or, to put it differently, what is required, from a purely hypothetical point of view and given the initial conditions of an economic system, to keep it along such a path?

Some economists do not agree with this approach, stating that economics, as a social science, should aim at providing explanations of *actual* tendencies rather than describing an ideal system. What may perhaps be considered pernicious, however, is attributing to an actual system the properties of an ideal one. Or, more specifically, stating equilibrium conditions --- or *ad-hoc* definitions --- as if these were accounting identities. This is done both by Piketty and Taylor.

Consider first the case of Piketty's 'First fundamental Law of Capitalism' (Piketty 2014: 52): $\alpha = r\beta$. He presents it as an accounting identity, but it actually is an *ad-hoc* definition, following from his very peculiar notion of 'capital'. This operational definition is then used (Piketty and Zucman 2014b: 45) to compute an *implied* economy-wide 'rate of return' $r = \alpha/\beta$, implicitly relying on the "institutional principle that profits are distributed in proportion to the ownership of capital" (Pasinetti 1974: 110), even though Piketty's capital-income share ($\alpha$) and wealth-to-income ratio ($\beta$) do not conform to the notion of *profits* and *capital stock* that underlie this institutional principle.

Moreover, Piketty (2014: 166) presents his 'Second Fundamental Law of Capitalism', $\beta = s/g$, as asymptotically valid in the long run; in other words, as an equilibrium (steady state) condition: it is the condition for $\beta$ to be constant over time. Conversely, Taylor inaccurately pretends that it is an accounting identity. When showing this, Taylor states that the rate of growth of real output "will be close to the growth rate of capital stock" (Taylor 2014: 5); this is true only along a steady growth path, when $I/K = g_n$, and hence such an assumption implies that the relation derived is an equilibrium condition, *not* an accounting identity from the SNA.

## 3. Theoretical versus Empirical Categories

Before proceeding to Taylor's (2014) interpretation of Pasinetti's (1962) framework, it is worth devoting a few lines to Piketty's use of data coming from the SNA. Again, computing synthetic measures that combine different aggregates (and especially stocks and flows) requires having a clear idea of which is the question to be addressed.

As regards stocks, Piketty provides an astonishing definition of 'capital' or 'wealth' (used interchangeably):[2] *private wealth* is the financial net worth plus the value of non-financial assets of the institutional sector 'Households and Non-Profit Institutions serving Households';[3] while *market value national wealth* is the sum of private wealth and the net worth plus value of real assets of the institutional sector 'General Government'. According to Piketty, the capital stock of corporations is *completely included* in the market value of

---

[2] See Piketty and Zucman (2014a: 9-12) for details.
[3] Households, hereinafter, for the sake of brevity.

equities and corporate bonds possessed by Households.[4] As concerns flows, 'income' is measured by Net National Income (NNI), i.e. GNI net of consumption of fixed capital.[5]

Clearly, computing a capital-output ratio based on such definitions, *to answer questions of growth theory*, is completely inadequate, for a series of reasons: (1) while the concept of income includes all institutional sectors, that of wealth excludes corporations;[6] (2) NNI is a different concept than output, since it is given by the net product plus net transfers to the rest of the world; (3) most importantly, the concept of the capital-output ratio aims at looking at the relation between the value of output and the value of the stock of capital which is currently installed as productive capacity. Piketty's notion of capital, by excluding corporations, and thus the value of their real assets (which contains the item *Fixed Assets*, i.e. the stock of accumulated, *productive* capacity), prevents us from interpreting $\beta$ as a measure of capital intensity.

The very fact that Piketty's measure of wealth only includes that part of the stock of fixed capital which is held by Households (an institutional sector which contains unincorporated business)[7] has an additional implication. The proportion of fixed assets held by Households to the total greatly varies from country to country and through time. Hence, using such a measure for international comparisons is misleading.

Then, one could think of attaching a completely different meaning --- *i.e.* outside the realm of growth theory --- to Piketty's 'wealth-to-income' ratio: how large is the value of the *stock* of private or national wealth in comparison to the *flow* of national income? Though approximately correct for the case of private income, for national wealth the ratio is inadequate to answer such a question. In fact, the institutional subsector 'Financial corporations' of the SNA also includes the *Central Bank*. Hence, by using Piketty's definition of wealth, one would be considering all public bonds held by the Central Bank--- and by all other corporations --- as a liability for the country as a whole, while the value of those held by Households would correctly cancel out with the corresponding liability of the

---

[4] See (Piketty and Zucman 2014b: 27). Instead, according to the SNA (UN 2009: 257): "For the economy as a whole, the balance sheet shows the sum of non-financial assets and net claims on the rest of the world. This sum is often referred to as national wealth". The SNA concept and Piketty's 'market value national wealth' coincide only when the net worth of corporations is *zero*, implying a value of Tobin's $Q$ identically equal to one for the aggregate corporate sector (for all countries and through time!). See Teplin and Antoniewicz (2006: 509) on the relationship between corporate net worth and Tobin's $Q$ in the SNA. Moreover, true consistency with the SNA implies that 'national wealth' for a *closed* economy is nothing but the non-financial capital stock, rendering crystal clear that aggregate financial assets and liabilities cancel out, representing *no* addition to the *wealth* of a national economy.

[5] See Piketty (2014: 583n7) and Piketty and Zucman (2014a: 11). By working in 'net' terms, Piketty has completely bypassed the algebra of fixed capital replacements and depreciation, which is not inconsequential for the results obtained, as well as their interpretation (van Schaik, 2014).

[6] Even if we were to assume (and we are not) that the market value of corporations is equal to the value of their capital stock, equities and bonds could be held by non-residents, or by *other* corporations such as *banks*.

[7] The definition of stock of fixed capital also includes dwellings, which are not strictly speaking productive capacity. However, this definition is consistent with that of gross fixed capital formation, which includes dwellings as well.

general government. This is not an innocent outcome, since it implies, consciously or not, that a central bank absorbing public bonds is, by definition, a net loss for the wealth of the country as a whole.

## 4. Kaldor-Pasinetti Theory of Income Distribution and Class Struggle

In line with what was stated in the Introduction, the first issue to clarify is the question which Pasinetti (1962) intended to answer. For given rates of growth of population and productivity,[8] *it is* possible to determine the amount of investment that would be necessary to undertake in order to maintain a situation of full employment. But given the propensities to save of laborers and capitalists, *is it* possible --- and under which conditions --- to determine a profit share, and hence a rate of profit, able to ensure the amount of profits necessary for such an investment level to be met?

This aim --- that of looking for *equilibrium conditions* --- is explicitly stated by Pasinetti himself:

"A second and separate problem concerns the interpretative value of the model. When Mr Kaldor presented his theory of income distribution, he pointed out that the interpretative value of the theory depends on the Keynesian hypotheses on which it is built. [...] But this is not the approach that I should like to take here. Whether we are or whether we are not prepared to accept the model in this behavioural sense, there are important practical implications which are valid in any case. I should look, therefore, at the previous analysis simply and more generally as a logical framework to *answer interesting questions about what ought to happen if full employment is to be kept over time, more than as a behavioural theory expressing what actually happens.*"

Pasinetti (1974: 118-9, emphasis added)

On the contrary, Taylor interprets Pasinetti's scheme as a descriptive one:[9]

"In his original model, Pasinetti operated in a rather different world, assuming full employment (determining $u$ [the output/capital ratio]) and in line with Piketty a given growth rate [of investment *demand*] $\widehat{K}^s$. He then argued that $\pi$ [the profit share] would adjust so that (4) [the equation describing the capital stock growth rate permitted by available savings] could be satisfied. If $\widehat{K}^s$ were to go up there would have to be a wage squeeze to generate 'forced saving' to meet higher investment demand."

(Taylor 2014: 12)

Moreover, Taylor states that the analysis of the dynamics of wealth concentration is the key contribution of Pasinetti's article (Taylor 2014: 12). Quite the opposite, Pasinetti's

---

[8] The role of the evolution of per capita final demand for consumption is not explicitly acknowledged in Pasinetti (1962), but its importance and articulation within the *logic* of this framework can be seen in Pasinetti (1963, 1981).
[9] This interpretation of Pasinetti's framework also emerges in Taylor's retrospective analysis of Pasinetti (1981): "Pasinetti (like Kaldor) goes further [...] by also postulating that there is full employment in the natural system. Output is then fixed by labour supply." (Taylor 1995: 699).

conclusions are that (1) the equilibrium distribution between *profits* and *wages* depends neither on workers' propensity to save nor on the stock of capital --- and on the relative magnitude of $K_c$ and $K_w$; (2) the equilibrium distribution of income between *workers* and *capitalists* does not depend on $K_w$ and $K_c$, but only on $I/K$ and $X/K$ --- and on both $s_c$ and $s_w$. In other words, the $Z = K_c/K$ ratio plays basically no role in Pasinetti's treatment of income distribution.[10]

The issue is slightly more subtle than what the formulae reveal. In fact, keeping in mind the aim of Pasinetti's article --- looking for equilibrium conditions for *physical reproduction*, in the spirit of Marx's reproduction schemes --- it should be clear that nothing is done in order to describe the actual *mechanisms* of a *working* capitalist economy. On the contrary, explicit reference is made to the possibility of applying the *same* framework to both a capitalist and a socialist system.

As soon as capitalism is introduced into the picture, it is hard to consider the distribution of the capital stock between workers and capitalists emerging from Pasinetti (1962) as a description --- even in terms of equilibrium conditions --- of the actual dynamics of wealth concentration. Indeed, even if workers do actually lend money to capitalists in order for them to invest, this implies a *flow* of property income accruing to workers in the form of interest payments, but *not* the accumulation of a portion of the capital stock: the means of production that identify capital as a social relation are entirely possessed by the capitalists.[11]

In fact, within *this* context, individual workers are not entitled to claim property rights that give them true command over capital, nor to undertake investment --- but only saving --- decisions. Income can be hoarded, not only invested, so that if workers had a saving propensity greater than that required by actual investment decisions by capitalists, this would not imply any form of 'euthanasia of the rentier'.

## 5. Steady States for the Control-Ratio Z and Simultaneous Determination of Prices and Quantities

Taylor's (2014) way of elaborating on Pasinetti (1962) in order to determine the steady-state dynamics of the *Z* ratio comes directly from the work of Samuelson and Modigliani (1966), who deemed Pasinetti's result as 'paradoxical' --- though having to admit its correctness --- and looked for an escape route. In Pasinetti's words:

---

[10] The ratio $K_w/K$ is computed just as an intermediate step in order to obtain a definite expression for $P/K$ (Pasinetti 1962: 271).
[11] In Pasinetti (1962), $K_w$ may be interpreted as the stock of capital accumulated owing to workers' savings, rather than the stock of capital possessed by workers.

"If the capitalists were not to exist any more, their propensity to save obviously could not determine the rate of profit. There is, therefore, a way of preventing the Cambridge equation from operating, and that is by eliminating the capitalists from the system!"

(Pasinetti 1974: 130)

The paper by Samuelson and Modigliani (1966) gave rise to further research on the dynamics of $Z$ according to different hypotheses, *e.g.* as regards the 'aggregate investment' function (e.g. Darity, 1981).

Taylor (2014) further elaborates on this framework in relation to Piketty's analysis of the secular development of inequality. He emphasizes that Piketty uses marginal equalities involving an aggregate production function to *determine jointly* the profit share and the capital intensity by means of an adjusting capital/labor ratio, with full employment of the labor force. But full employment is almost never observed in real data.

Hence, a more realistic model is required "in which output, economic growth, employment and income are determined along Keynesian lines by effective demand" (Taylor 2014: 6). Taylor thus advances a framework where $(u, r, \widehat{K})$ are determined by $(\pi, Z)$ (Taylor 2014: 12), noticing, however, that in Pasinetti (1962) $(\pi, r, Z)$ are determined by $(g_n, u)$. Hence, looking at the logic underlying Taylor's model, especially in relation to Pasinetti (1962), some issues do emerge.

First of all, it is worth stressing that whereas Taylor eventually writes both the saving supply and investment demand as functions of the profit share $\pi$, these were originally specified as functions of the rate of profit $r$. If this original specification is kept, $u$ emerges from saving-investment market-clearing as a linear function of $r$, increasing when $(s_c - s_w)rK_c < \alpha rK$.[12] In his analysis, Taylor assumes such a positive relation between $u$ and $r$, i.e. a long-run profit-led growth regime. With this constraint, the dynamics of 'capital concentration' is determined by $\dot{Z} = [(s_c - \alpha)r - g_0]Z$, which can be zero (1) when $Z = 0$ (which corresponds to the Samuelson and Modigliani (1966) setting) or (2) when $r = g_0/(s_c - \alpha)$, *independently of $Z$*.

Second, there seems to be a crucial difference between the idea and role of capital/output ratio that Piketty, Taylor and Pasinetti have in mind. In fact, such ratio can be written as $\beta = K/X = (K/X^*)/(X/X^*)$, *i.e.* as the ratio between the full employment capital/output ratio $\kappa = K/X^*$ and the *output gap* $X/X^*$. Piketty has in mind a situation in which output is at its potential and hence $X/X^* = 1$, while $\kappa$ adjusts according to the usual marginalist mechanisms. Pasinetti also considers a situation in which $X/X^* = 1$, but in his case the stock of capital $K$ is determined by the technique in use, and hence $\kappa$ can change

---

[12] Note that the term $(s_c - s_w)rK_c$ measures the extra saving capitalists make out of their profits with respect to that which workers would make out of capitalists' profits. Quite differently, $\alpha rK$ is a measure of the extent to which investment responds to the rate of profit *independently of the category, which is saving*.

only due to technical progress, and *not* as an adjustment variable in the determination of income distribution. Finally, Taylor defines $u$ as the output/capital ratio, but considers it as an "activity level" indicator (Taylor 2014: 10); referring explicitly to Barbosa-Filho and Taylor (2006) and Kiefer and Rada (2013) where $u = X/X^*$. In essence, Taylor (2014) may be implicitly considering $\kappa$ as fixed, so that saving-investment market-clearing in a 'profit-led' regime on the one side, and a symmetric profit-squeeze mechanism --- the more output falls short of potential, the higher the profit share --- on the other, *simultaneously* determine both $X$ and $r$ (because $X^*$ is taken as given).

   This reveals the deep conceptual difference between the analyses of Taylor (2014) and Pasinetti (1962). In the latter, income distribution --- that is, the weights with which $s_c$ and $s_w$ enter into overall saving propensity --- makes aggregate saving to equalize equilibrium investments, themselves determined by the technique in use and the evolution of final demand for consumption.[13] The overall saving propensity is the variable which adjusts to guarantee an amount of savings equal to the exogenously given equilibrium investment level. Hence, at a *normative* level, the maintenance of *natural* growth *logically* implies a certain distribution between wages and profits.

   In Taylor's framework, on the contrary, $u$ and $r$ --- that is, activity level and distribution --- are *simultaneously* determined through 'price-quantity' interactions that clear the market for 'capital' and trigger a profit-squeeze mechanism. The nature of these 'price-quantity' interactions, inspired by Goodwin's (1967) prey-predator scheme of 'class struggle', was originally intended to depict "a starkly schematized and hence quite unrealistic model of *cycles in growth rates*" (Goodwin 1967: 54, emphasis added).[14]

   This notwithstanding, Taylor (2014) intends to explain long-run development. In other words, Taylor develops an analytical scheme which aims at coping with *long-run* tendencies, but embodying mechanisms at work in the explanation of *medium-run* cycles. Stacking both layers by using medium-run mechanisms to characterize long-run steady states (*e.g.* as regards assumptions on the sign of the derivatives that define stability), may not be as straightforward as it seems.

   In fact, when dealing with the difficulties entailed in providing a unified framework to characterize both cycles and growth, Pasinetti observed:

   "[O]n the one hand, the macro-economic models which provide a cyclical interpretation of economic activity cannot give any explanation of economic growth, and, on the other hand, those theories which define, or rely on, the conditions for a dynamic equilibrium to be reached and maintained cannot give an explanation of business cycles."

---

[13] In the context of Pasinetti (1962), which deals with uniform steady growth, the evolution of final demand for consumption is determined by population growth.
[14] Note, moreover, that Goodwin (1967: 54) assumed a fixed and constant technically feasible capital-output ratio $\kappa$.

(Pasinetti 1974: Chapter III, 69)

In a few words, Pasinetti envisaged the following problem:

"the excessive degree of confidence [...] in the investment function, the parameters of which are responsible for a radically different behaviour of the system according to the range of values they fall in. This is surprising because no economist would be prepared to rely very much on the stability over time of these parameters"

(Pasinetti 1974: Chapter III, 71)

In fact, in Taylor's scheme the dynamics of the system entirely depends on the functional form chosen for the investment function.

# References

Barbosa-Filho, N. H., and L. Taylor. 2006. "Distributive and Demand Cycles in the U.S. Economy --- A Structuralist Goodwin Model." *Metroeconomica* 57: 389-411.

Darity, W. A. 1981. "The Simple Analytics of Neo-Ricardian Growth and Distribution." *American Economic Review* 71, no. 5: 978-993.

Goodwin, R. M. 1967. "A Growth Cycle." In *Socialism, Capitalism and Economic Growth --- Essays presented to Maurice Dobb*, ed. C.H. Feinstein, 54-58. Cambridge: Cambridge University Press.

Kiefer, D., and C. Rada. 2013. "Profit Maximizing Goes Global: the Race to the Bottom." University of Utah, Department of Economics Working Paper Series 2013-05.

Pasinetti, L. L. 1962. "Rate of Profit and Income Distribution in Relation to the Rate of Economic Growth." *Review of Economic Studies* 29, no. 4: 267-279.

Pasinetti, L.L. 1963. *A Multi-Sector Model of Economic Growth*. Cambridge, UK: King's College.

Pasinetti, L. L. 1974. *Growth and Income Distribution --- Essays in Economic Theory*. Cambridge: Cambridge University Press.

Pasinetti, L. L. 1981. *Structural Change and Economic Growth --- A Theoretical Essay on the Dynamics of the Wealth of Nations*. Cambridge: Cambridge University Press.

Piketty, T. 2014. *Capital in the Twenty-First Century*. Cambridge, Mass. & London: The Belknap Press of Harvard University Press.

Piketty, T., and G. Zucman. 2014a. "Capital is Back: Wealth-Income Ratios in Rich Countries 1700-2010." *Quarterly Journal of Economics* (Forthcoming).

Piketty, T., and G. Zucman. 2014b. "Capital is Back: Wealth-Income Ratios in Rich Countries 1700-2010 - Data Appendix." Accessed at: http://piketty.pse.ens.fr/files/PikettyZucman2013Appendix.pdf

Samuelson, P. A., F. Modigliani. 1966. "The Pasinetti Paradox in Neoclassical and More General Models." *Review of Economic Studies* 33, no. 4: 269-301.

Taylor, L. 1995. "Pasinetti's Processes." *Cambridge Journal of Economics* 19, no. 5: 697-713.

Taylor, L. 2014. "The Triumph of the Rentier? Thomas Piketty vs. Luigi Pasinetti and John Maynard Keynes." Schwartz Center for Economic Policy Analysis and Department of Economics, New School for Social Research, Working Paper Series 2014-8.

Teplin, A. M., and R. Antoniewicz. 2006. "Integrated Macroeconomic Accounts for the United States: Draft SNA-USA." In *A New Architecture for the US NationalAaccounts*, ed. D.W. Jorgenson, S.J. Landefeld, W.D. Nordhaus, 471-540. Chicago: University of Chicago Press.

UN. 2009. *System of National Accounts 2008*, ST/ESA/STAT/SER.F/2/Rev.5. New York: United Nations.

van Schaik, T. 2014. "Piketty's Laws with Investment Replacement and Depreciation." Vox.eu. Accessed at: http://www.voxeu.org/article/piketty-s-two-laws