

Mister Piketty and the Classics

Alain Herscovici

This paper aims to make a critical and methodological analysis of the theses presented by Piketty in his book "Capital in the twenty first century" (2014). If, as noted by Ricardo, the main problem of political economy is to determine the laws that regulate the distribution of income among different social classes; the study of such mechanisms must be supported by a theoretical background which defines a value theory and the nature of capital. The whole modern epistemology (Popper, Kuhn and Lakatos) refutes the positivism and demonstrates that reality observation is, by nature, interpreted within a theoretical matrix.

Income distribution and long term growth are linked to the specificities of capital and to the choice of a value theory: in Ricardo's theory of differential rent, for example, heterogeneity of land determines the income distribution; whereas, deriving out of homogeneous capital, neoclassical theory explains income distribution encompassed by a traditional production function. *The definition of the nature of capital and the choice of a value theory are the necessary conditions to explain the modalities of growth and income distribution.* In this regard, Piketty discards the Cambridge Controversy, from empirical arguments (2014, p. 167). The empiric data cannot constitute a demarcation criterion. This debate occurs at a theoretical level, and the arguments must be theoretical ones.

Piketty's approach discards the social and historical dimension of capital: if we consider economic anthropology and economic history approach (Marx, Braudel, Dumont, Polanyi), it is possible to affirm that capital is a social mechanism limited to capitalism, and it cannot be extended to other modes of production. Piketty considers capital as supra-historical. This means that social relations and modalities of expectations elaboration are "immutable". We can speak in capital *reification*: capital is not conceived as a social and historical relation, but as a "thing" whose qualitative characteristic does not change over time.

From the Neo-Ricardian and Keynesian framework, the value of some quantity of aggregate capital depends on the value of distribution variables and on expectations (Herscovici, 2013). Distribution variables, and/or expectations, determine the value of an aggregate quantity of capital. Although Piketty invokes classical and Keynesian authors, he deduces income distribution from capital evaluated as "quantities"; in regard to a Keynesian and/or Neo-Ricardian perspective, I will demonstrate why Piketty's argument is fallacious.

I will formulate three kinds of criticisms: the first one comes from Economic History (Braudel, 1979, 1985, Polanyi, 1983), Economic Anthropology (Dumont, 1985), and Institutional Economics (Orléan, 2011); the second one, from the Cambridge Tradition, mainly from Ricardo, Marx, Keynes and Sraffa. The third one is related to the fact that Piketty does not adopt a specific theoretical matrix and mixes various incompatible methodological frameworks. Consequently, his empirical observations are not, in most part, theoretically coherent.

In the first part, I will present the framework designed by Piketty and his main results. In the second part, I will highlight the absence of History and the methodological problems present in Piketty's démarche.

I) Piketty's thesis: a first approach

1) *The two fundamental laws of capitalism*

1.1 *The first fundamental law*

The first fundamental law is represented by the following equation (Piketty, 2014, p. 42):

$$\alpha = r \cdot \beta \quad (1)$$

α as the share of income from capital in the national product, β as the capital/ income ratio (the capital coefficient), and r as the rate of return on capital.

This equation shows, without any ambiguity, that *income distribution is determined from the quantities of capital*. The increase of β , from the law of decreasing marginal product, implies that the marginal productivity of the capital decreases. As observed by Solow (2014), the variation of α depends on the relative variations of r and β . If the decrease of r is proportionally less important than the increase of β , α will increase.

The impact of the increase of β on the share of income on capital in the product depends on the substitution elasticity of the production factors. In the aggregate production function used by Solow in his seminal model (1956), such elasticity is equal to one: the decrease of r is compensated by the increase of β , and the share of income from capital (and from labor) is constant. The verification of Piketty's result, i.e. the increase of α , in the long run, implies in substitution elasticity higher than one. Piketty does not justify such hypothesis. But once adopted, from equation (1), in a mechanical and tautological manner, the share of profit will increase.

We must note that such observations only apply to productive capital, i.e. to capital used directly in production. However, Piketty invokes the Ricardian theory of differential rent to justify his thesis (2014, p. 11). He establishes the following parallel:

according to Ricardo, the concentration of income is explained by the ownership of land. In Piketty's analysis, such concentration is explained by the capital ownership. *Such parallel is partial and fallacious:*

- In Ricardo's theory, the scarcity of the lands of best quality explains the increasing land ownership's share of income. Such rent is explained by scarcity and, as Ricardo demonstrates, is totally unproductive. *The Ricardian concept of scarcity can only be applied to patrimonial and eventually to speculative capital.* On the other hand, *the law of diminishing returns can only be applied to productive capital.* This highlights the limits of applicability of equation (1) and the limits of Piketty's hypothesis related to substitution elasticity of production factors.

- In the classical, the neoclassical and the Keynesian tradition, the tendency to decrease profit rate is explained by the abundance of productive capital: the economic development for Ricardo (1821), the increase in the organic composition of capital for Marx, the decreasing diminishing returns law for the neoclassical school, and the decrease of the marginal efficiency of capital for Keynes. This means that, *in Piketty's analysis, the decrease in the profit rate of productive capital would be compensated by the increase of return obtained from the other kinds of capital.*

This mechanism shows explicitly that the income concentration is not due to the capitalist, i.e. the owners of productive capital, but to the rentiers, i.e. the owners of patrimonial and speculative capital¹. But are these other kinds of capital scarce, from a qualitative and quantitative criterion? There is neither empirical nor theoretical robust evidence to confirm the existence and the intensification of the scarcity of such kind of capital in the long run. On the contrary, the financialization of economies translates abundance of financial capitals. Notwithstanding, scarcity is the necessary and sufficient condition to support Piketty's thesis.

1.2 The second fundamental law

$$\beta = s/g \quad (2)$$

(s a saving rate, g as the income increase rate and β as the capital /income ratio)

The saving rate s determines the capital coefficient. So, in the long run, investment is funded by saving (Piketty, 2014, p. 144). This is a long run law that will be achieved only tendentiously. Such law is valid only if "asset prices evolves on average the same way as consumer prices" (Idem, p. 122): (a) there is not theoretical justification to validate such hypothesis and (b) *In regard to a Neo-Ricardian approach, this implies that the ratio capital/labor (the organic composition of capital) is the same in the*

¹See Marwil-Dávila and Oreiro, 2016.

capital production and consumer goods production sectors. And there is no reason to verify this hypothesis .If asset prices increase proportionally more than consumer goods, β will increase regardless of s .

Piketty interprets Harrod basic equation in the following way:

$$g = s/\beta \quad (3)$$

If β is constant, as supposed by Harrod, the rate of income increase is entirely determined by the saving rate. Instability is explained by the impossibility to verify (3). This is an erroneous interpretation: the Harrodian instability is explained, in the short run, from the discrepancy between the rate of increase of the real income and the warranted rate, and in the long run from the discrepancy between the natural rate of increase of income G_n and the warranted rate (Harrod 1939, Herscovici, 2006(a)). On other hand, there is path dependence: the long term position depends on the short term fluctuations (Besomi, 2001).

(a) From a Keynesian perspective it is not possible to affirm that the saving rate determines the level of the product. Saving is a determinate and not a determinant variable.

(b) The fact to suppose that β is constant may not be justified from technological specificities, as Piketty supposes (Piketty, 2014, pp. 165 and 166).

(c) Solow's model (1956) corresponds to the following equation:

$$\beta = s/g \quad (3')$$

The capital coefficient is determined by the rate of saving. β is not any more constant and adjusts to the value that corresponds to the balanced growth path from s variation. In Solow's model (1956), adjustment mechanism towards the steady-state position is based on such relation.

This relation is totally incompatible with Harrod's perspective: on one hand, in Solow's model, the factors substitution allows to realize the convergence towards the steady-state position. On the other hand, saving determines this long run convergence process. Such causality implies in validating the loanable funds theory and all the causal structure of neoclassical macroeconomics (Herscovici, 2006 (b)).

From (1) and (2), we can deduce that:

$$\alpha = r \cdot s/g \quad (4)$$

The rate of return on capital and the saving rate determine the share of income from capital in the national product. Such mechanism is based on the active role of saving. Finally, the smaller g , the higher α : periods with a weak rate of increase of national income correspond to an increase in the relative share of income from capital. This corresponds to the stylized facts, from 1990 until today ².

In regard to the inverse relationship between abundance of capital and return rate, we must deduce that the decrease in return rate on capital is compensated by an increase relatively more important in capital value, i.e. in β . One more time, we are confronted (a) with the problem of the historical evolution of the value of different quantities of aggregate capital and (b) with the heterogeneity of such capital and of such return rates.

2) *The main concepts: definition and theoretical framework*

2.1 *The capital*

Piketty defines capital from its economic form: capital is defined as “all forms of real property (including residential real estate) as well as financial and professional capital (plants, infrastructure, machinery, patents, and so on) used by firms and government agencies.” (Piketty, 2014, p. 36). Such definition includes financial capital, capital used directly in productive activities, and all forms of immaterial capital.

Such definition is essentially *patrimonial* and directly related to the concepts of wealth and property. From such perspective, capital is equivalent to wealth (Idem). This definition is “weak” for the following reasons: capital is a heterogeneous aggregate and, from a theoretical and empirical approach, we are confronted to the problem of the measurement of an aggregate quantity of capital.

The theoretical problem was systematized by Ricardo, Sraffa and the Neo-Ricardian school, and led to the Cambridge controversy; this theoretical debate cannot be resolved based on empirical data. In this respect, Piketty affirms that “the virulence—and at times sterility—of the Cambridge capital controversy was due in part to the fact that participants on both sides lacked the historical data needed to clarify the terms of the debate.” (Idem, p. 167). Such simplistic positivism does not allow ignoring the debate that starts with Ricardo, goes on with Marshall and Keynes, and is systematized with Sraffa and the Neo-Ricardian school:

i) First, it is not possible to study data without a referential theoretical matrix. This contradicts all the modern epistemology results, from Popper to Lakatos. It is not possible to realize an observation and a classification of data independently from a theoretical framework. In this respect, Lakatos demonstrates that a progressive Program of Scientific Research is characterized by the fact that theoretical development must anticipate the empirical one (Lakatos, 1978, p. 79); the systematic use of the inductive

²For an alternative analysis, see Marwil-Dávila and Oreiro, 2016.

method to justify hypothesis, as Piketty does, is characteristic of a degenerative program.

ii) Secondly, the heterogeneity of capital involves the problem relative to the construction of tools that allow measuring quantities of aggregate capital and its evolutions in the long run. Neoclassical production functions conceive the aggregate capital as a quantity; the income distribution is conceived as the contribution of production factors to the product. The negation of the Cambridge controversy allows Piketty (a) to deduce, as neoclassical school does, the income distribution from the quantities of factors and to interpret the data from such neoclassical framework. The empirical observations and Piketty's economic laws depends on such premises³ and (b) are the logical consequence of assimilation of quantities and values.

*Some authors demonstrated that it is possible to assimilate quantities and values only when capital is homogenous*⁴. Empirical results would be totally different if Piketty would use other hypothesis. To solve this problem, he proposes to evaluate all forms of wealth in terms of market prices at a given point in time (Piketty, 2014, p. 108). This resolution is particularly incomplete: how is it possible to compare market prices of productive capital, financial capital and "patrimonial" capital? The modalities of determination of prices are different and specific for each type of capital. Markets for intangible and financial capital are particularly unstable: beyond this instability, is it possible to draw a long run tendency?

2.2*The determination of the rate of return*

The rate of return of the capital is defined by the ratio between the capital return during a given period and the value of the capital invested (Idem, p. 93).

i) *To what extent is it possible to apply the same rate of return to heterogeneous capital?* The return of productive capital is the profit rate, the return of the financial capital, in its speculative dimension, is fundamentally the corresponding variations of its value. If some kind of capital is determined in function of the use value (family patrimony, for example), what is the meaning of a rate of return applied to such capital?

Keynes made this kind of differentiation between speculative investments and productive ones: the former are related to the short run, do not work for the general interest, and its return depends on the information asymmetries, the latter presents the opposite characteristics (Keynes, 1936, p. 132) .

In chapter XVII of the General Theory (p.188), Keynes demonstrates that there is a specific rate of interest for each kind of capital. For example, if the spot value of 100

³In respect to the theoretical and empirical limits of such approach, see (Felipe J., McCombie, J. S. L. [2005])

⁴In regard to the demonstration of such result, see Herscovici (2015).

quarters of wheat is £100 and the forward value of the same quantity £105, for one year, “(...) the “wheat- rate of interest” is 5 per cent per annum.”(Idem). Now, let us suppose that the forward value of 100 quarters of wheat is £107, and the money-rate interest 5 per cent. The “wheat- rate of interest of money”, is minus 2 percent per annum: it allows buying 98 (105/107) quarters of wheat in the future. Consequently, Keynes affirms, in regard to commodities, that “(...) there is no reason why their rates of interest should be the same for different commodities” (Idem, p. 89). *The rate of return is different for each commodity and for each capital.* Such mechanism may be applied to the method used by Piketty, as he evaluates the returns on capital.

ii) The second problem is related to the relationship between the (monetary) rate of interest and the profit rate. According to Piketty, the rate of return on capital is “(...) a broader notion than the “rate of profit,” and much broader than the “rate of interest,” while incorporating both.”(Ibid, p. 42); this means that the determinant variable is the rate of return on capital, and not the monetary rate of interest.

Both the Classical/Cambridgian and the Keynesian economy conceptions allow refuting Piketty’s affirmation.

-According to Keynes, each asset depends on four attributes: q , the expected yield, c the carrying cost and l the liquidity-premium (GT, p.191). If a is the expected appreciation of the asset in terms of itself, the return of each asset is equal to $(q - c + l + a)$. If we consider, for example, two productive assets and the money, and if we suppose the carrying costs negligible, the stock equilibrium implies that the return of each asset is equal:

$$q_1 + a_1 = q_2 + a_2 = l_3 \quad (5)$$

(assets 1 and 2 are productive assets and asset 3 is the money).

Equation (5) expresses the equilibrium conditions: in this situation, the rates of return of the different assets are equal. If the rate of return of one kind of capital is higher than the other rates of return, equilibrium will be broken; capital will be invested in the sector that presents the higher rate of return.

(a) On the one hand, the Keynesian dynamic may be explained in the following way: if the rate of return of a capital x is higher than the rates of return of other kinds of capital, such situation implies an increase of its demand and in a decrease in x marginal efficiency, in regard to short and long run mechanisms (GT, chapter 11). Such mechanism will work until x marginal efficiency is equal to the rate of return of the other capitals, i.e. to verify the equilibrium conditions.

(b) On the other hand, the return rate of money is defined by the liquidity premium; its marginal efficiency does not decrease systematically (Kregel, 1980) when its demand increases. It is the reason (a) why the money-rate of interest is the greatest (GT, p. 189) and (b) why it will be determinant in the investment decision.

(c) Why doesn't the marginal efficiency of money decrease when its demand increases? This may be explained by the role of store of wealth assumed by the money: if the liquidity preference increases proportionally more than the supply of money, the rate of interest will increase (GT, p. 144). We must observe also that the rate of interest is determinate in an exogenous way (Vercelli, 1991, Pasinetti, 1997, p. 209); This conception is totally different from the natural rate of interest determined by the loanable funds theory.

(d) Investment depends on the difference between the return of capital and the return of money, i.e. the monetary rate of interest. When the return of capital (or its marginal efficiency) is higher (lower) than the monetary interest rate, the demand of such capital will increase (decrease): this is a choice assets mechanism.

Contrary to Piketty's hypothesis, the rate of interest is a key variable to explain, at the micro and macroeconomic level, the investment function: its level determines the last profitable investment (Pasinetti, 1997, p. 215) and, consequently, the total capital.

2.3 *The value of an aggregate quantity of capital*

From a Neo-Ricardian/Cambridgian perspective, we can solve the problem related to the measurement of a quantity of aggregate capital and of the comparison of its evolution in different periods. As demonstrated by Ricardo and by the Neo-Ricardian school, such resolution implies in evaluating the dated labor in function of the current values of distributive variables (Cohen, Harcourt, 2003).

We obtain the same kinds of results from the Ricardian theory of differential rent: the economic growth translates in an increase of the wheat demand, and as the wheat value is determined by the quantity of labor on the worst land, the wheat value increases at each period. *The Ricardian argument argues that the commodities value is determined by the economic growth and/or by a modification of the distributive variables.* This is a historical approach: the change in one of the exogenous variable (economic growth and/or distribution variables) implies a change in goods and capital value. *Inversely, the constant value of capital implies that distribution variables are constant during the period studied and that there is not economic growth.*

Piketty ignores such mechanism: he evaluates the stock of capital from the market prices and affirms that dynamic of the ratio capital/product may be analyzed independently of capital distribution (Piketty, 2013, p. 268)⁵. It is the reason why he interprets Harrod's hypothesis of constant coefficient of capital from the specificities of the technology (Idem, p. 165 and 166), and reduces Harrod's model to a short-run business cycle model (the "razor edge" interpretation).

⁵ The French version (2013) is different from the English one (2014); I will use both.

Such affirmations show profound misunderstanding of the theoretical debate for the following reasons:

i) Harrod was aware of the Cambridge controversy. The hypothesis of a constant coefficient of capital is justified by such approach, and not by a technological constraint.

He knew that there is not a monotonic relationship between the rate of interest and the quantity of capital used in the production function; if there is not a negative correlation between the quantity of capital and the rate of interest, there is not negative correlation between the rate of interest and the capital coefficient; consequently, there is not a perfect substitution of production factors. This result justifies Harrod's hypothesis. As Solow demonstrated nearly twenty years after Harrod, the convergence towards the equilibrium position is realized when the substitution of the production factors is total. Reswitching of techniques demonstrates that such substitution mechanism is not valid for all values of the interest rate and, consequently, that substitution of production factors is limited. It is the reason why, in his model, Solow considers a single-good economy (1956).

Piketty evaluates the capital in quantities. Then, he deduces the income distribution from these quantities; the way he interprets all the data is obligatory biased. It is not use to invoke the classical and Keynesian economists, as he does, using a neoclassical methodology, to formulate "heterodox" results. On the other hand, the intensification of inequalities in income distribution is verified when the substitution elasticity is higher than one. From a neoclassical perspective, this is an atypical production function.

II) The main methodological oppositions

1) *Some methodological observations: the substantive hypothesis*

1.1 Dumont (1985) demonstrates that Economic Science, since Smith's investigations, adopts implicitly the substantive hypothesis: from the labor commanded theory of value, value in exchange is the power of a commodity to purchase other goods—its price. The exchange value of a commodity A is equal to the quantity of labor that A can purchase, exchanging A by B; A exchange value is equal to the quantity of labor incorporated in B. So, *Smith's concept of exchange value is defined from two dimensions: the production and the exchange* (Idem, p. 225): the exchange value is concretized in the exchange by the quantity of labor incorporated in B production.

Consequently, labor is the common substance of all commodities. In other words, it comes to an objective definition of exchange value (Ibid., p. 128). Exchange value is a relationship between things and not between men, *and each commodity has an intrinsic*

value defined from the quantity of labor: this definition allows ignoring the social and historical dimension of exchange.

From such result, Smith will universalize the exchange social mechanism, from the “ingenious” example of a hypothetical primitive society where all members have a natural propensity to exchange: Smith tries to prove that “(...) labor is the value substance (...), and that value is totally disconnected from its social context (...)” (Ibid., p. 228). *Such approach denies the historical dimension of the different modes of production and universalize the social and economic characteristics of capitalism.*

1.2 Braudel’s works allow reaching the same conclusions. He distinguishes three levels: the material life, the market economy and the capitalist economy. The first one is related to the material reproduction of the society, mainly to self-consumption; the second one to the competitive exchange, the competitive markets, and the third one to the continuous flow, to the primacy of the circulation activities, to the asymmetric information and to its international dimension, i.e. the capitalist markets (Braudel, 1985, p. 22).

Braudel’s approach highlights the historical (in opposition to universal) dimension of capitalism and capital:

- In regard to the second level (the market economy linked to exchange), he affirms that “between 1400 and 1800, an important part of the production (...) disappear in the self-consumption of the family or the village, and does not enter in the market exchange” (Idem, p. 22).

- On the other hand, market economy is a necessary but not sufficient condition to implement a capitalist system (Ibid. p. 44). A capitalism system is defined by the generalization of the third level, and not only by the existence of markets.

- As noted by Braudel (1979, p. 270), from an historical and theoretical perspective, it is not possible to assimilate wealth and capital. The concept of capital corresponds to Turgot and Quesnay’s concept of *avances*: it may be defined by a productive investment, i.e. capital as a production factor (Quesnay, apud.Braudel, 1979, p. 271). Capital is directly connected to exchange value, i.e. to a capitalist system as defined by Braudel, while wealth assumes different forms in relation to the economic specificities of each society. The assimilation between wealth and capital is not historically and theoretically justified and leads to analytical confusion: Kuznets (cited by Braudel, 1979, p. 287) affirms that “(...) it is possible to question whether there was a formation of fixed and durable capital before 1750 (...)”.

1.3 Polanyi affirms that the creation of wealth, in other mode of production than the capitalist one, “(...) does not depend on markets” (1983, p. 71) and that “(...) the economic system is a simple function of social organization.” (Idem, p. 79). The economic system is embedded in the social system, and the partial systems (cultural,

political, religious and so on) are not regulated from the economic system, but regulate it.

In Piketty's historical analysis, History is absent. If capital is the product of specific social relations, the measurement of its evolutions can be made only for the same historical period regulated by the same kind of social relations. The universalization of the concept of capital implies the permanency of this kind of social relations; as seen, such hypothesis must be refuted.

As Braudel wrote, the other modes of production before capitalism were characterized by the primacy of the use value (Braudel, 1985, p. 22), even when markets activities were developed. The social forms of wealth have no relationship with the exchange value: for example, self-consumption, in regard to the anthropological concept of extended family, social use value or gift economy, in the sense defined by Mauss (1923-1924).

2) *The Cambridgian models*

2.1 The main results of Kaldor's model (1955-1956) are the following ones:

$$\frac{P}{Y} = \frac{1}{sp-sw} \cdot \frac{I}{Y} - \frac{sw}{sp-sw} \quad (6)$$

(P as the profit, Y as the National Income, sp and sw as the capitalists and the worker's marginal propensity to save, and I as investment; $sp > sw$)

Such equation highlights the primacy of capitalists' expenditures: the profit share in the national income depends on capitalists' productive expenditures, i.e. on the investment (Ibid., p. 96). If sp is low (because, for example, capitalists' consumption is high), the coefficient $1/sp-sw$ is high as the multiplier effect on the profit share; if sw is nil, we can observe a negative correlation between the marginal propensity to save of the capitalists and this multiplier effect.

Investment is an exogenous, i.e. an independent variable that does not depend on the marginal propensities to save (Ibid. p. 95).

Then, we can write:

$$\frac{P}{K} = \frac{P}{Y} \cdot \frac{1}{v} \quad (7)$$

(v as the capital coefficient)

This mechanism shows that there is a negative correlation between the profit rate and the capital coefficient.

Harrod's model may be expressed in the following way:

$$I/Y = G \cdot v \tag{8}$$

(G as the income growth rate)

From (7) and (8):

$$\frac{P}{Y} = \frac{1}{sp-sw} \cdot G \cdot v - \frac{sw}{sp-sw} \tag{9}$$

The logical problem is linked to the modalities of determination of the value of v , and once again to the relationship between the distributive variables (here the profit rate) and the value of v and Y : As writes Kaldor, “ (...) Gv Will be dependent on the rate of profit.(...) the value of particular capital goods in terms of final consumption goods will vary with the rate of profit” (1955-1956, p. 98).

Table 1: *Kaldor versus Piketty*

Piketty	Kaldor
$\alpha = r \cdot \beta$	$r = \alpha / \beta$
$\alpha = r \cdot s / g$	$\alpha = g \cdot \beta / s$

In Kaldor's relations, the profit rate is endogenous and depends, in a negative way, on the coefficient of capital. This can be justified by the classical and Keynesian concept of abundance of capital (Herscovici, 2013). In Piketty's formulation, on the contrary, the profit rate is exogenous; this character exogenous is justified by some statistical regularities.

According to Piketty's framework, the profit relative share is positively determined by the profit rate and the rate of saving, and negatively by the rate of increase of the income. *We can note the crucial role of saving; this is a characteristic of neoclassical macroeconomic causality, i.e. Say's law.* The Kaldor's mechanisms are totally different: the profit relative share depends positively on the income rate of growth and on the coefficient of capital, and negatively on the rate of saving; such results are Keynesian

(and Kaleckian): they highlight the positive role of expenditures on the profit share and the negative one of the rate of saving.

2.2 Pasinetti's model implies modifying the problematic linked to income distribution, from the distinction between profits and wages and capitalists and workers incomes (1962, p. 270): if workers save, they earn part of the global profit. The effective distribution of income is not limited to the distribution between wages and profits. There are two modalities of income distribution: the *functional* one concerns the distribution between wages and profits, and is directly connected with the production factors. The second one may be called *patrimonial distribution*: the income depends on the capital goods that were purchased from saving.

The main results may be expressed by the following equations:

$$S_w = s_w (W + P_w) \quad (10)$$

$$S_c = s_c \cdot P_c \quad (11)$$

S_w and S_c as workers' and capitalists' saving, P_w and P_c as workers' and capitalists' profit, W as wages, and s_w and s_c as workers and capitalists' marginal propensity to save. These equations express the mechanism linked to patrimonial distribution of income: workers and capitalists' saving depends on their respective incomes. In the long run equilibrium position, we have:

$$P_w/S_w = P_c/S_c \quad (12)$$

The ratio of the profits to the saving is the same for workers and capitalists (Idem, p. 272).

From (11) and (12) it is possible to deduce that:

$$P_c/S_c = 1/S_c = P_w/S_w \quad (13)$$

So, the workers' profit depends only on the capitalists' propensity to save. Such results are expressed in the following equations:

$$\frac{P}{K} = \frac{1}{S_c} \cdot \frac{I}{K} \quad (14)$$

$$\frac{P}{Y} = \frac{1}{S_c} \cdot \frac{I}{Y} \quad (15)$$

The total profit rate and the total profit share depend on the capitalists' productive expenditures; such ratios are determined independently from the workers' propensity to save. The total profit rate and the total profit share are entirely determined by the capitalists' decisions (Ibid., p.273 and 274).

There is no reason to deduce that, systematically, income concentration will intensify; the return on the patrimonial capital will be the same for the two social groups, as shown in equation (13). An intensification of the income concentration at the expense of workers only may be explained by a decrease of the wages proportionally more important than an increase in the profit.

On the other hand, Pasinetti's conception of capital is based on productive capital: the patrimonial profit come from the total profit generated by productive capital, in the productive sector: such conception is incompatible with Piketty's.

3) The self-referential value

3.1 *Self realizable expectations*

The concept of self-referential value was designed by Keynes in the General Theory, from the parable of the newspapers competition whose winner is the competitor whose choice more nearly corresponds to the real choice made by the "public opinion". Such parable is used to describe the mechanism that corresponds to the financial speculation, and to explain why some agents realize gains.

“ (...) the price being awarded to the competitor whose choice most nearly corresponds to the average preferences of the competitors as a whole; so that each competitor has to pick, not those faces which he himself finds prettiest, but those faces which he thinks likeliest to catch the fancy of other competitors, all of whom are looking at the problem from the same point of view. (...) We have reached the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be.” (GT, p. 130).

Each individual may elaborate expectations related to the intrinsic value of the asset and determine its fundamental value (the face that is, for him, the most beautiful one). Notwithstanding, there is no objective reason for the market validating this specific expectation; the market only validates the average opinion. If we define as *first degree expectations* those that correspond to the face that each competitor considers the most beautiful, and *second degree expectations*, those that each competitor thinks that the market will choose, the individual that will win is the one that foresees better the expectations expressed by the majority of participants.

If each individual creates expectations from such mechanism, the market will validate the expectations related to the expectations related to the expectations of the most part of the individual; it is a *third degree expectation*.

We should also note that the way a concrete market is working implies that individual's expectations are not homogeneous; such expectations must be divergent. In a speculative market, for the exchange being realized, some individual must believe that the asset value will increase, and other that it will decrease (Grossman and Stiglitz, 1980). The "majority opinion" will determine the effective tendency.

This mechanism is characterized by a *self-referential definition of value*; the value effectively validated by the market is the one that corresponds to the majority expectations. There is not a constant long term position value that market prices will reach, but value is determined by such interactions, in regard to expectations modalities of elaboration, and to mimetic behaviors. Such value is relatively stable when a specific convention is working, and changes when the convention changes (GT, p. 126). *Value is not an immanent property of the assets; on the contrary, value is created and modified from such social interactions, i.e. from such modalities of elaboration of expectations and beliefs.*

Speculative bubbles may be analyzed from such perspective. Given that the value is no longer determined by reference to fixed parameters, but due to self-realizable expectations, a cumulative process may appear and develop from some determinate convention. Such process may include upward or downward expectations: the speculative bubble will remain as such convention remains. Fluctuations are not limited by the divergence from the fundamental value because such fundamental value does not exist.

Contrary to neoclassical analysis, there is no intrinsic value that constitutes the regulatory variable from which the market prices will oscillate: on the contrary, value is determined by these self-realizable expectations and by the individual behaviors; in other words, *there is an endogenous determination of value.*

This approach is intrinsically different from the analysis that rational expectations theory makes of speculative bubbles: first, there is not fundamental value to regulate and to limit the prices variations. Second, expectations are heterogeneous; not all individuals have the same expectations.

Such results may be extended to most part of intangible capital, as Intellectual Property Rights, Patents, internet economy and so on: in such sectors, it is theoretically impossible to determine a fundamental value related to this kind of capital (Herscovici, 2014). In the absence of regulatory variables, i.e. of fundamental value, such markets are particularly instable: how is it possible to measure this kind of capital and its evolutions in the long run, as Piketty does? Theoretically and empirically, it looks impossible.

3.2 *The concept of relational economy*

The refutation of the substantive hypothesis explains why it is necessary to provide alternative explanation of the determinant of value: these explanations will focalize on the relationship between individual.

As seen before, speculative fluctuations are the product of such relationships: the speculator gain comes from the fact that he anticipates “(...) *the base of conventional valuation a few months hence (...)*” (GT, p. 129). This framework was developed by Grossman and Stiglitz (1976, 1980): in regard to financial market, it is possible to demonstrate that informed agents realize gains because non informed agents realize losses: “*the informed, on average, buy securities when they are “underpriced” and sell them when they are “overpriced” (relative to what they would have been if information were equalized).*” (1980, p. 394). Value is produced by the combination of mimetic behaviors and asymmetric information.

The price system does not convey all qualitative information and there is a strong uncertainty in regard to quality. The efficiency wages theory, for example, demonstrates that the quality of the labor depends directly on its price. Consequently, there is a positive correlation between wages and demand for labor; this is an atypical demand function. Then, labor quality depends on the worker’s ex-post behavior. In this sense, it is possible to speak in relational economy. Finally, the homogeneity hypothesis is not more verified: quality is not constant neither can be considered as an intrinsic characteristic of the asset (or commodity), but depends on the behavior of the supplier.

The homogeneity hypothesis adopted by the neoclassical economy allows defining the *objective characteristics* of goods and assets, independently from social, historical and economic variables (Orléan, 2011, p. 87); this means defining the intrinsic value, in its quantitative and qualitative dimensions. Such value is determined independently from price and from relationship between agents on the market.

Relational Economy highlights the fact that asset value is the result of interactions between individual: value (and capital value) is produced, in an endogenous way, by the market. Once again, we can see that the possibility to measure different quantities of capital and its evolutions in the long run implies that such relations must be permanent. And they are not: first, the absence of a fundamental value translates into a high volatility of such market; second, in regard to such volatility, an average value in the long term is not representative of the speculative dimension of such markets.

Final remarks

In conclusion, we can affirm that Piketty's results are not based on a coherent and a trustworthy methodological framework. They come to an epistemological patchwork⁶ without internal coherence. The abundance of data does not compensate the epistemological poverty and the methodological incoherence.

Moreover, one of the countless paradoxes present in this book may be expressed in these terms: Piketty wants to draw a long term and exhaustive historical panorama of the income distribution without considering the changes in social and economic relations: he postulates the invariance of such relations, i.e. the absence of historicity.

If capital is defined as "the sum total of nonhuman assets that can be owned and exchanged on some market" (Piketty, 2014, p. 38), the only condition that allows to study the evolution of capital from ancient times to 2100 A.D (Idem, p. 75) consists in postulating the existence of market as regulatory variables during all this period; this means denying the historical specificities of each period.

As Coase wrote (1995), if you torture the data long enough, it will confess; processing empirical data without defining beforehand a coherent framework is a manner to torture them; and they confessed what Mr. Piketty wanted them to confess.

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⁶ Patchwork, in the sense Piketty uses various incompatible theoretical frameworks, and he does not respect the internal coherency of each one. Such observation may be applied both to the way Piketty uses orthodox and heterodox frameworks.

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