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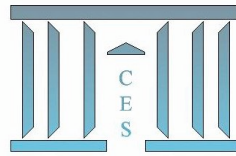
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# What understanding of capital for tomorrow?

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## Abstract

This paper discusses the thesis put forward by Piketty (2014a) stressing the risk of an explosion of wealth inequality because capital accumulates faster than labor income in several countries, especially in the U.S. Although the overall empirical conclusion on the rise of inequalities is indisputable, I point out that the economic modeling underlying this approach exhibits several important shortcomings. Moreover, there are more effective policy recommendations to fight against inequality than the one highlighted in the book —namely, a world-wide global tax on capital.

**Keywords:** Capital, Capitalism, Inequality, Kaldor, Solow, capital tax.

**JEL Classification:** B22, B4, H20, N10.

## 1 Introduction

Piketty (2014a) offers a deductive approach to the issue of inequality, starting with the two “fundamental laws of capitalism”. The first one is extremely simple:

$$\alpha_t = r_t \beta_t \tag{1}$$

where  $\alpha_t$  stands for the share of capital incomes in total national income,  $r_t$  is the average rate of (“pure”, according to the author) return on capital, and  $\beta_t := K_t/Y_t$

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is the ratio of capital stock,  $K_t$ , on annual income,  $Y_t$ . This formulation is actually an accounting tautology, the importance of it rests upon the use Piketty makes of it. In this approach, he is following in the footsteps of many others by deducing  $r_t$  from the observed  $\alpha_t/\beta_t$  ratio. (We will return to this later.) The second “law” may be the more important one:

$$\beta = s/g \tag{2}$$

where  $s$  stands for the households’ saving rate and  $g$  is the real growth rate of the economy. Around these two relationships, the author organizes a vast empirical array of material. The principal interest of this harvesting of historical data is to highlight the recent and massive resurgence of a rising weight of capital in the economy (relative to economic activity) and high inequalities in income distribution. The relatively equal-distribution world of the “Trente Glorieuses” being giving way to highly (again) unequal societies in the West where, due to patrimonial inertia, the “present might be devoured by the past”. In the author’s opinion, these trends are not random. They obey a long-lasting logic of capital accumulation, whose effects have been softened in the 20th century, by wars, fiscal policies not favorable to rent economies, and strong post-Second World War economic growth. These three factors have eroded over the last generation and almost disappeared today according to the author. Piketty asserts the long-lasting logic of capital accumulation is showing its power again. The best way to fight this trend, and even reverse it, would be to establish a progressive global tax on capital — a proposal which is developed in the final chapter of the book.

The rest of this paper examines, step by step, the various aspects of this argument. The next section begins by discussing the critics formulated by Piketty against the conventional interpretation of Kaldor facts. Sections 3 and 4 deal respectively with the second and the first “fundamental laws” of capitalism. The following section discusses Piketty’s stance on income and patrimonial inequality, while the last section considers the main policy recommendation of Piketty (2014a) namely a progressive global tax on capital.

## 2 Hard times for the Kaldor facts?

Let us start with Piketty’s marshaling of evidence that the alleged “Kaldor facts” (Kaldor (1957)) are not empirically confirmed. In 1957, Nicholas Kaldor thought he had identified six “stylized facts”, including the long-term stability of  $\alpha$  and  $\beta$ . Obviously, however,  $\alpha_t$  is not a long-term constant per se, even if it seemed to have

long been behaving in a rather stable way through time and space (between 0.3 and 0.4.) In the same way,  $\beta_t$  is not a long-term constant either. Kaldor never claimed these variables must remain constant in an absolute sense, but rather that they evolve around an average number in relation to which their variations progressively sum up to zero. They do not, however, display any significant long-term trend according to Kaldor.

Variations of  $\alpha_t$  are problematic for most of the macroeconomic literature, since they invalidate the crucial assumption that the relative weights of capital ( $\alpha$ ) and labour (supposed to be  $1 - \alpha$ ) in national income are constant —an assumption that enabled one to describe productive technology with a Cobb-Douglas production function without any loss of generality.<sup>1</sup>

Piketty, who is certainly not the first to discover that  $\alpha_t$  is not constant over time, does not challenge the most common production functions in macroeconomics. His concern with giving priority to empirical evidence rather than to models, though, should have prompted him to do so. Anyway, he prefers to structure his analysis along the two “fundamental laws” of capitalism.

These laws suppose the aggregation of all the very disparate forms of capital (real estate assets, financial assets, infrastructure, industrial capital, agricultural land...) into a unique and single category. Whether such an all-embracing category makes sense remains an open question. From the standpoint of ecological economics, at least, the answer is negative. Productive infrastructure (such as manufacturing facilities and processing factories) have a relationship to natural resources and energy which is entirely different from financial bank accounts. What kind of meaningful conclusion can be reasonably drawn from such an agglomerate of physical items —matter, energy, etc.— with symbolic conventions such as money ? Moreover, since there is obviously no physical unit that can create a metric to quantify such a heteroclite cluster, Piketty can only really consider the *market value* of this wealth. His measure of capital is therefore not physical but exclusively financial.

Once this new category of (agglomerized financial) capital is established and accepted, one can proceed to evaluate the evolution of the  $\beta_t$  ratio in the future. This reconstitution of the capital time series was carried out by Piketty, Atkinson and several of their co-authors<sup>2</sup>: While  $\beta_t$  is estimated to have culminated at 6-7

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<sup>1</sup>The supposed invariance of  $\alpha$  (together with the constant returns assumption) turn the description of production by a Cobb-Douglas-type function equivalent to a trivial accounting equation. Cf. Phelps-Brown (1957), Simon (1979), Simon and Levy (1963).

<sup>2</sup>The reconstitution was made easier by the fact that, for a few years now, most OECD countries keep up patrimonial accounting under the form of existing stocks balance sheets, rather than (as it was the case until now) merely accounting for flows (of investment, savings and depreciation).

in the nineteenth century, the ratio dropped to 2-3 after the Second World War. However, it has now (2014) increased to 5-6 again. Piketty rightly suggests that in the future, real growth rates will likely not exceed an average 1 or 1.5% per year. If the saving rate of a country remains close to 10%, this would mean that its  $\beta_t$  ratio could remain stable at 6-7, as it is currently the case in France. According to Piketty's research, it could even reach 10.

Besides questioning some of Kaldor's "stylized facts", the other major argument of Piketty (2014a) may be summed up this way: there is ample evidence that during the last two centuries, the rate of return on capital  $r_t$  (which comes from (1)) was often significantly higher than the annual growth rate,  $g_t$ . In the very long run,  $r_t$  would consequently have always stayed above 4%. But, if  $g_t$  is bound to remain under 1.5%, the consequence is that the difference,  $r_t - g_t$ , will be kept equal to 2 to 3 points of national income. Should this be the case, it implies that those already possessing capital will be able to become richer far more rapidly than the rest of the population. This is especially true for employees, whose salary is their only source of income. Such a conclusion is of major interest for ecological economics for instance, as has been illustrated by Motesharrei et al. (2014), where it is suggested that the reduction of inequality is a condition *sine qua non* for avoiding a global collapse of industrial civilization.

By contrast, Piketty's thesis is *not* that the increase in income and patrimonial inequalities would lead to any internal contradiction of the capital accumulation logic. This should not come as a surprise, since  $r > g$  in the long run is perfectly compatible with standard equilibrium conditions in neoclassical models. For instance, the balanced growth path in the workhorse Ramsey-Cass-Koopmans model is characterized by:<sup>3</sup>

$$r = \rho + \theta g,$$

where  $r$  is the return of capital,  $\rho$  is the subjective discount factor of the representative household,  $\theta$  measures the (constant) relative risk aversion of this household, and  $g$  is the growth rate. So that, as soon as, say,  $\rho \geq 0$  and  $\theta \geq 1$  (with at least one inequality being strict), one gets a neoclassical rationale for the gap,  $r > g$ , empirically observed by Piketty. His own framework being tightly linked to the neoclassical framework (more on this latter), Piketty could hardly claim that this inequality should lead

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Empirical work carried out by Piketty and his colleagues consists in prolonging to the past this accounting of stocks by using historical information (most often decadal), annualized thanks to flows accounting and smoothed with the help of an *ad hoc* "capital gain" rate.

<sup>3</sup>See, e.g., Romer (2006), Chap. 2.

to an internal break-down of capitalism. He rather claims that it does represent a threat to democracy. Hence his proposal at the end of Piketty (2014a): to set up a global tax on capital that would help reduce the differential,  $r_t - g_t$ . His ambition is not to transform capitalism — the immanent forces that, according to the author, keep the differential,  $r_t - g_t$ , at its current level would stay in place — but to correct the distortions of patrimonial distribution created by this differential.

### 3 The second “fundamental law of capitalism”

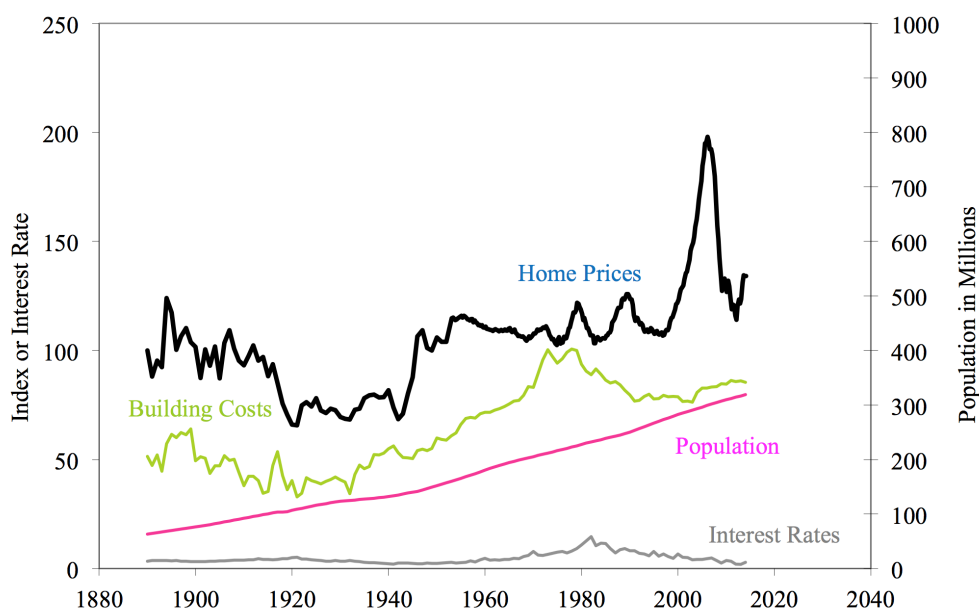
Contrary to the first “law” (1), the second one is not a tautology: depending on the viewpoint, it is either the Harrod-Domar equation or a characterization of the steady state in a Solow-Swan model (or any of the neoclassical variants of it). Piketty gives it the status of a “fundamental law” on the grounds of the empirical observation, corroborated in Piketty and Zucman (2014) (PZ henceforth), that the law would be approximately validated in the very long run in a group of key economies.

#### 3.1 In search for an empirical confirmation

It is important to point out that (2) is nowhere verified at a given moment, even given a very generous degree of approximation. PZ interpret this fact by rightly noting that the world in which we live is predominantly a monetary world, while Harrod-Domar’s and Solow’s universe are ones where money plays no role. Therefore, equation (2) only makes sense if the relative price of capital does not significantly differ from the price of consumption goods. Such an affirmation is partially confirmed by the evolution of the real price of housing in the U.S., as shown on the following graph (where “home prices” designate real housing prices):<sup>4</sup>

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<sup>4</sup>Borrowed from <http://www.econ.yale.edu/shiller/data.htm>.



The chart shows indeed that, adjusted for inflation, the housing bubble initiated in the U.S. in the middle of the 1990s represents a catch-up process measured from the lowest point on the chart, during the inter-war period. Between 1890 and today, the average differential between the price of real estate assets and the general price level has been of only about 3% of the real estate price level. To the extent that real estate represents roughly 50% of capital during the major part of this period, this augurs well (at least for the U.S.) for the result sought by PZ. According to the latter, relative prices variations of the various components of capital would in the very long term cancel out each other to reveal the operations of the second fundamental law—an evolution all the more tenuous in that it is invisible in the short run data as already pointed out.

Is the attempt to empirically validate the second fundamental “law” in the long run successful? PZ show that between 1970 and 2000, the relationship characterized by the second fundamental law accounts for only 60% of the evolution of  $\beta_t$ : 40% of the relationship remain unexplained.<sup>5</sup> The authors think that this “residual” is to be explained, as it happens, by the boom in relative prices of capital. Indeed, over the 1870-2010 period, equation (2) accounts for 90% of  $\beta_t$ 's evolution in France and in the U.K. Do we have any empirical confirmation of (2)? Data are less supportive in the case of the U.S. and Germany: (2) underestimates  $\beta_t$  by 25% in the U.S. and overestimates it by 25% in Germany. One would be tempted to conclude (following the authors) that financial and real estate assets are overestimated in the U.S. and

<sup>5</sup>“Explain” must be understood here in its weakest sense: variations of the right-hand side variable in (2) reproduce x% of variations of the left-hand side variable.



that they are bound to be corrected upwards in Germany. But it would be putting the cart before the horse to interpret the data by taking the relation (2) as being true, while what needs to be done is precisely *first* verifying if (2) is indeed supported by the data. In short, so far, there is little convincing empirical confirmation of this alleged “second law of capitalism”.

What is more, Bonnet et al. (2014) show that Piketty’s result on the alleged explosion of wealth inequality is based on the rise of only one of the components of capital, namely housing capital, and due to housing prices. “Productive” capital, excluding housing, has only risen weakly relative to income over the last few decades, so that over the long-run, the “productive” capital/income ratio has not increased at all. This remark has a number of consequences. First, the “law” (1), as tautological it might seem, becomes all the more problematic: on the right hand side of the equation, indeed, the capital/income ratio,  $\beta_t$ , is evaluated according to housing prices ; on the left, however, the flow,  $\alpha_t$ , is measured through housing rents, not housing prices. As observed by Bonnet et al. (2014), we have witnessed a decoupling between rents (which remained stable or grew only mildly<sup>6</sup>) and housing prices. This decoupling is responsible for the fact that  $\beta_t$  may have increased substantially, while  $\alpha_t$  remained stable. Second, “rent represents both the actual income of housing capital for landlords and the dwelling costs saved by ‘owner-occupiers’ (people living in their own houses)” (Bonnet et al. loc. cit.) Consequently, one still needs to explain how an increase of  $\beta_t$  solely due to housing prices, associated with a stable (or even, sometimes, decreasing)  $\alpha_t$ , could foster an explosion of wealth inequality. Bonnet et al. (2014) claim that, as long as it is not a bubble, the huge inflation in housing prices cannot deepen wealth inequality.<sup>7</sup> Hence, the discussion on the impact of such a phenomenon boils down to knowing whether the housing price inflation is a bubble (i.e., reflects a divergence between current prices *versus* expected and discounted value of future rents) or not. Piketty clearly opts for a bubble (see, e.g., p. 172) while Bonnet et al. (2014) refuse to take any stance. In any case, being a long-run, non-monetary theory of capital accumulation, Piketty’s modeling background does not enable the expression of anything more than a mere common sense opinion on that matter.

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<sup>6</sup>This decoupling has one major exception: Germany, partly because, in that country, housing prices did not increase at the same pace as elsewhere.

<sup>7</sup>It would go beyond the scope of this paper to challenge this assessment —which is presumably wrong as soon as private debts enter the picture: if owners need to borrow money in order to buy a house, housing prices are likely to have a profound impact on indebtedness, hence on inequality between (poor) borrowers and (wealthy) lenders.

### 3.2 What does this “law” actually mean ?

All this does not yet say anything about the way the “law” itself should be interpreted. A little reflection immediately shows that (2) is not thought of by Piketty within the Harrod-Domar framework: this would imply a constant return,  $r$ , for capital, and complementary inputs —two properties that are explicitly rejected by Piketty. Therefore, only two hypotheses remain conceivable. The first one states that the relationship expressed in the law is verified asymptotically only in the very long run, and that we are fortunately reaching this final moment. This is the idea underlying Solow’s dynamics.<sup>8</sup> Such a Solovian interpretation of (2) would suppose to empirically study the transitional dynamics (outside the steady state) of capital accumulation — what PZ do not do<sup>9</sup>. On the contrary, the validation exercise carried out by PZ presupposes that we should ideally be observing equation (2) at every moment,<sup>10</sup> only disrupted by shocks whose mean tends to zero in the very long run, *precisely like for the “Kaldor facts”*. Such a way of doing is compatible with a Solow-like interpretation only if we acknowledge that industrialized economies already reached the steady state of their dynamics in the mid-19<sup>th</sup> century. But this does not fit with the starting point of Piketty (2014a) (the questioning of the “Kaldor facts”): at the steady state,  $\alpha$  should be constant. This first hermeneutics of (2) is therefore self-contradictory, and must be abandoned.

The second interpretation of (2) boils down to considering it as a purely accounting equation. Let us write the capital accumulation equation:<sup>11</sup>

$$K_{t+1} = K_t + s_t Y_t. \quad (3)$$

Moreover, let us temporarily consider (3) as an accounting equation, insofar as it serves as a building block in the time series developed by by PZ (cf. note 4 *supra*). It is equivalent to:

$$\beta_{t+1} = \beta_t \frac{(1 + \frac{s_t}{\beta_t})}{1 + g_t} \quad (4)$$

Of course, *if Kaldor is right*,  $\beta_t \rightarrow \beta$ ,  $s_t \rightarrow s$ ,  $g_t \rightarrow g$ , and we come back to (2). Provided that we consider (3) as a tautology, (2) is thus equivalent to one of the

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<sup>8</sup>In his own commentary of the French version of the book, Robert Boyer seems to be leaning toward such an interpretation, cf. Boyer (2013).

<sup>9</sup>What do, in contrast, Mankiw et al. in their famous paper Mankiw et al. (1992)

<sup>10</sup>This would be indeed the case within the Harrod-Domar setting, which, however, is not compatible with Piketty’s framework, as already said.

<sup>11</sup>Capital depreciation is included by Piketty in the very definition of capital; it is therefore absent in (3).

Kaldor facts. But the whole book endeavors to demonstrate that these facts are not empirically established —again, a contradiction.

On the other hand, if equation (4) were purely an accounting one, it should be accurately validated at every moment in time, except for inevitable measurement errors. This is not the case, as we have seen previously. As a consequence, the second interpretation of (2) cannot be connected with Piketty’s global analysis either.

We are thus left with the following question: What does the “second law” actually *mean* ?

### 3.3 Additional difficulties

In addition to these basic problems, let us briefly examine five other difficulties raised by Piketty’s conceptual framework.

#### *A confusion between net and gross saving ?*

First, as it is expressed in net terms, the “second law” seems to be intrinsically flawed, as has been alleged by a number of commentators.<sup>12</sup> Indeed, the saving rate,  $s$ , is defined by Piketty (p. 174) as the ratio of net investment to net income, where “net” means, in this case, net of depreciation, that is:

$$s := \frac{I - \delta k}{y - \delta k} \quad (5)$$

where  $\delta \in (0, 1)$  is the depreciation rate,  $I$  stands for investment,  $y$  for the output, and  $k$  for the capital stock. This peculiar definition is crucial in order to achieve the “second law” in the form used by Piketty (namely (2)). As acknowledged by the author (footnote 12 on p. 594), had  $s$  be defined in gross terms, (2) would have been written f

$$\beta = \frac{s}{g + \delta}$$

instead. It is on the latter formulation that most neoclassical textbooks base their account of Solow’s growth model. The basic difference between the two formulae stems from the need to assume that the saving rate is constant in the long run. Indeed, both theories (the textbook writing of Solow’s seminal work and Piketty’s “law”) assume that the saving rate (defined in gross terms in the former theory, in net terms in the latter) is constant. Otherwise, as stated by James Hamilton, “the ‘second fundamental law’ has no implications or predictions whatsoever for what will

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<sup>12</sup>To name but a few: Larry Summers (<http://www.democracyjournal.org/33/the-inequality-puzzle.php>), Per Krusell and Tony Smith (<http://aida.wss.yale.edu/smith/piketty1.pdf>), James Hamilton (<http://econbrowser.com/archives/2014/05/criticisms-of-piketty>).

happen to the share of capital income in the economy or anything else, and claims that Piketty has uncovered some underlying principles of capitalism are completely without substance”.<sup>13</sup>

Unlike what Piketty seems to suggest, however, given that  $s$  must be constant, the two versions of his (second) “law” — the one given in the text on page 168, and the (more standard) one given in footnote 12 on page 594 — contradict each other. Either net saving is a constant fraction of net income (as Piketty assumes throughout his text and in PZ) or gross saving is a constant fraction of gross income (as Piketty assumes in footnote 12 in accordance with most neoclassical textbooks). My point, here, is not to take a stance on whether the assumption of a constant gross saving rate is empirically more plausible than Piketty’s assumption,<sup>14</sup> but to point out that Piketty’s formulation implies the extreme and utterly unrealistic conclusion that, as  $g \rightarrow 0^+$ , then,  $\beta \rightarrow +\infty$ , as  $s$  remains constant and positive. By contrast, in neoclassical textbooks, as the growth rate falls to zero, the net saving rate also falls to zero, which is compatible with capital being maintained at a constant level. Now, if the net saving rate shrinks to 0 as  $g \rightarrow 0^+$ , the unfortunate consequence for Piketty’s argument is that no explosion of wealth inequality will necessarily follow in the context of a steady state.<sup>15</sup> This does not mean that such an explosion is unlikely to happen in the near future, rather that Piketty’s approach seems unable to account for such a phenomenon.

One easy way, however, to defend the “fundamental law” (2) against the latter criticism is to observe that, actually, the Solow dynamics does not need the saving rate,  $s$ , to be constant for any growth rate,  $g$ . On the other hand, (5), a constant rate  $s$  and  $\beta \rightarrow +\infty$  are easily seen to be hardly compatible. Indeed, (5) implies:

$$s = \frac{\frac{I}{y} - \delta\beta}{1 - \delta\beta} \xrightarrow{\beta \rightarrow +\infty} 1.$$

A constant  $s$  would mean that the saving rate should have been equal to 1 to start

<sup>13</sup><http://http://econbrowser.com/archives/2014/06/educating-brad-delong>

<sup>14</sup>Again, reexamining the mainstream postulates underlying both Piketty’s and more standard neoclassical formulations would go beyond the scope of this paper. Both, indeed, rely on the idea that higher saving rates increase output per head. By contrast, Keynes established that a higher propensity to save does not necessarily induce higher investment, but surely leads to a reduction in output and employment in the short-run because of a fall in effective demand. On the other hand, as underlined later in this paper, even the neoclassical interpretation of the basic equation  $I = S$  —which is common to Piketty’s framework and to all the neoclassical literature— is not correct in general.

<sup>15</sup>Postwar U.S. data, moreover, suggest that decades with low growth have typically been associated with low (or even negative) net saving rates, contradicting Piketty’s standpoint.

with. Thus, it seems that the unique way to understand Piketty's argument is to postulate that  $s$  is constant up to a certain threshold,  $\bar{\beta}$ , above which it must necessarily increase. Such a reinterpretation of the "fundamental law" (2) requires understanding it as a relationship *loosely* drawing its inspiration from Harrod-Domar-Solow (HDS) but not formally depending on it, and whose ultimate relevance would essentially rely upon its empirical validation.<sup>16</sup> In his response, (Piketty (2014b)), to a preliminary version of this account of his book<sup>17</sup>, Piketty seems to confirm that viewpoint (I translate):

"This book's main ambition is to establish a number of facts and historical regularities, in order to overcome the purely theoretical speculations which have too often stood as research as such. Theory, models and mathematical equations, like for instance the notion of production function  $Y = F(K, L)$ , or the law asserting that, in the long-run, the capital/income ratio  $\beta = K/Y$ , under certain assumptions, tends to approach  $\beta = s/g$  also play a certain role in the book. But this role is modest, much more limited, I believe, than what Gaël Giraud's report might let one think. Furthermore this role is tied to what equations can bring to the research in social sciences in general: By simplifying reality in an extreme manner, one may sometimes hope to isolate interesting logical relationships between abstract concepts. This is useful only under the condition that the impact of such abstract constructions be not overestimated, and that one never forgets that all these concepts are socially and historically determined concepts. As is pointed out (quite clearly I believe) early in the book, I have never thought that notions of aggregate capital,  $K$ , and production function,  $Y = F(K, L)$ , enable one to get an accurate description of the state of production relationships within a given society."

This answer is at the very least paradoxical : Firstly, as we have seen, a convincing empirical confirmation of the "second law" is lacking. And yet, this would have provided us with an important "fact and historical regularity". Second, Piketty's predictions that capital-to-income ratio is poised to skyrocket are not mere extrapolations from historical data but, instead, rest importantly on the use of economic theory. Third, Piketty sometimes uses a rather precise specification of the Solow

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<sup>16</sup>Such a standpoint could drive us to adopt a Friedmanian epistemology, assuming that it does not matter if hypotheses are unrealistic provided conclusions are "satisfactory" (Friedman (1953)), and it would take us away from scientific reasoning.

<sup>17</sup>Cf. Giraud (2003), based on the French version of Piketty (2014a).

model to defend his thesis: for instance when the author discusses the capital/labour elasticity of substitution, he deduces from the fact that the series  $(\alpha_t)_t$  and  $(\beta_t)_t$  look correlated that this elasticity might have been slightly above 1 for some decades (p. 216 sq). Such an argument heavily relies upon the properties of the production function with constant elasticity of substitution (CES) and on the assumption that the rate of return on capital corresponds to its marginal productivity.

*Are capital returns decreasing ?*

The next difficulty arises from the fact that, in several instances Piketty seems to be endorsing as a self-evident truth that returns on capital are decreasing. This property is certainly a key one, e.g., to the Solovian dynamics, because without it the dynamics would not admit any steady state (so an equation like (2) would not make sense anymore, if it ever had to be understood in a Solovian context)<sup>18</sup>. But its empirical verification at a microeconomic level is very problematic (Cf. e.g. Blinder et al. (1998) and J. and Guthrie (1952)). As regards the fact that macroeconomic estimations invariably suggest constant returns to scale (which can contribute to justifying the idea that partial returns on capital are lower than 1), it arises from a well-known accounting artefact, Samuelson (1979). Last, but not least, we shall see in the next section that, actually, even the very definition of the capital's return is very fragile, let alone any assessment about how it behaves whenever the stock of capital moves.

*Is money neutral ?*

Next, an important question deserves to be asked: assuming that (4) is empirically verified in the long run, does it mean that monetarists are right and that money is nothing but a “veil” ? If the dynamics of capital (especially monetary and financial assets owned by economic agents) can be interpreted through the lense of a “real” equation which gives no role to money, this does actually mean that in the long run Say was right ? Should it be the case, we would still have to establish the short and medium term variations of relative prices of capital with its internal accumulation dynamics. This is an impossible task to carry out within the moneyless HDS theoretical framework (within which Piketty's reasoning is deeply embedded).<sup>19</sup> Finally, such a “monetarist” conclusion makes it all the more difficult to understand what “capital” really means in Piketty's work. For the author, money is indeed a necessary ingredient to homogenize and to quantify the heteroclite items which make up

<sup>18</sup>The Harrod-Domar model has constant returns to scale. As regards the understanding of (2) as an accounting tautology, returns to scale do not matter.

<sup>19</sup>There are extensions of the HDS framework adding money to the model, but Piketty does not seem to build upon them. Anyway, they require a re-writing of (2).

his definition of “capital”, but at the same time, money is to be taken as economically irrelevant in the long-run. Again, this looks like a paradox, to say the very least.

*Where does instability come from ?*

Whatever the epistemological status of “law” (2)<sup>20</sup>, its alleged economic meaning is unequivocal:  $g = s/\beta$ , i.e., in the very long run, the only economic force steering growth is capital accumulation. Raw materials (energy in particular), human capital, institutions... all these items do not contribute to growth, except through their influence on the fundamental engine that drives capital in the very long run — a financial entity called “capital”, which has no physical substance. What can be said of Piketty’s understanding of history given these facts? The economy is supposed to follow an autonomous logic — a type of capital accumulation not compatible with the HDS corpus (as we have seen), but whose meaning still depends, in some obscure way, on this theoretical background, disturbed in the short and medium term by exogenous shocks stemming from political history (wars and fiscal policies). Nevertheless, and at variance with what a truly Solovian reading of (2) would suggest, this does not mean in Piketty’s understanding that the potential validation of (4) would imply the end of history:  $\beta_t$  is clearly capable of moving upwards and thus provoking social tensions. These tensions would surely cause exogenous shocks on the HDS economic model. In other words, Piketty essentially replaces the internal instability of growth that was intrinsic to the Harrod-Domar approach by an intrinsically stable mechanism (vaguely inspired from Solow) and outsources the instability of deregulated capitalism to the political sphere.

## 4 The “first law of capitalism” and the Cambridge capital controversy

Because of its tautological nature, (1) seems to be free of the difficulties that beset fundamental “law” (2). Better yet: (1) allows one, in a usual manner, to deduce the rate of return,  $r_t$ , from the observed value of capital income,  $\alpha_t$ , and from the patrimonial stock,  $\beta_t$ .<sup>21</sup> In view of the above-mentioned variations of  $(\alpha_t, \beta_t)$ , such a way of proceeding might have implied a radical dismissal of the idea that the rate of return of a production factor should be equal to its marginal productivity. In a Harrod-Domar perspective, indeed,  $r_t$  should stay constant. In a Solovian one,  $r_t$

<sup>20</sup>Or, what amounts to the same thing, of the interpretation of the residue in (4) as coming only from a price effect. And the latter would be, moreover, negligible in the long run.

<sup>21</sup>A similar use of (1) can be found, e.g., in Mankiw et al. (1992), loc. cit.

is bound to follow a downward trajectory in all countries, and to finally converge toward the productivity of the national steady state (itself equal to the depreciation rate of capital). Only exogenous shocks can move it away from this fate. As said before, however, Piketty does not question this supposition, which is one of the most elementary prerequisites of neoclassical microeconomics. He rather limits himself to mentioning the possibility of a discrepancy between  $r_t$  and the marginal productivity of capital, due to market imperfections.

To understand Piketty's so-called "first fundamental law" (2) it is best to revisit the controversy that opposed Cambridge (U.K.) economists and their Cambridge (US) colleagues during the 1950s-1960s. The former (Robinson, Sraffa, Pasinetti...), principally connected to left-wing European intellectual movements, defended the idea that the various forms of capital (housing assets, land, machinery, financial assets...) cannot be correctly represented through the abstract concept of "capital". This attack on neoclassical macroeconomics prompted their more right-wing overseas adversaries to respond with equal vigor (Solow, Swan, Samuelson...). For the left-leaning Cambridge-U.K. side the argument was the following: the neoclassical definition of capital requires that productivity be defined as the discounted sum of future capital returns compared to the cost of its present use. Insofar as the rate of return on capital is, thereafter, defined according to the productivity of capital (deemed to be decreasing), there is a fatal flaw created by the circularity of the analysis: rates of return are self-defined, and thus remain unexplained. That such a circularity also plagues Piketty's set-up is an obvious and inevitable consequence of its very definition of capital as a financial, all-embracing entity. Of course, what is at stake on the neoclassical side is the attempt to naturalise the rate of return on capital by presenting it as a measurement of its productivity — a physical or technical property which seems independent of current social conflicts, and which could be paradoxically captured by a purely financial measurement of capital. In the end, Samuelson himself acknowledged that the "British" were right: neoclassical economics is unable to think out and define in a purely logically fashion the abstraction called "capital", cf. Samuelson (1966). Only Sraffa's conceptual effort made it possible to get out of the vicious circle in his celebrated book, Sraffa (1960).

#### 4.1 A defense of Cambridge (U.S.) ?

What is Piketty's stance in the debate? In a section entitled "Beyond the two Cambridge" (p. 364), he blames the "British" for having rejected the neoclassical framework since they wrongly considered this framework as a conceptual approach devoid of any (social) conflict. This brings us back to the ambivalent relations between "law"



(2) and the HDS framework. As we have seen before, the “law” depends on the use of the neoclassical paradigm, be it in an hidden or explicit manner, though social conflicts are still present as externalized shocks. Yet, does this answer Cambridge (U.K.)’s criticism?

Interpreted in this way, however, Piketty’s work does hardly provide us with a coherent theory of capital (let alone of capitalism). His approach is far less ambitious than endeavours by Marx, Schumpeter, Keynes, the French Regulation and Conventions Schools and *a fortiori* the British Cambridgians. Piketty’s approach consists in merely measuring empirically the observable terms of the equation for fundamental law (2). It is the basic reason why the (positive) difference between  $r_t$  and  $g_t$  does not impact  $r_t$  (as in Marx) or  $g_t$  (as in Schumpeter’s or Keynes’s perspectives). The strength of such a phenomenological approach —let’s call it the “tax expert” stance— is that it avoids the debate that would boldly challenge the whole of neoclassical theory, upon which fundamental “law” (2) rests. The price to be paid, however, is that it does not allow us to make a judgment on the variations of  $r_t$ : is it a price paid that is too high? Or too low? What criteria can be used to tackle this question? Piketty’s book provides few answers to this basic question. Nor does Piketty give reasons why the gap,  $r_t - g_t$ , might fundamentally threaten democratic systems. Indeed, the relations between the economic and the social systems are not studied for themselves. Since the economic sphere is viewed as a merely passive system vulnerable to exogenous political shocks, the sociological or political determinants of this threat deserve to be made much more explicit. How and why do we pass from a very high concentration of wealth to the ruin of democratic institutions, and what are the social forces capable of resisting, absorbing and restricting the effects of this new situation ?<sup>22</sup> The author is certainly aware of the neoclassical models derived from Solow which try to justify the income gap, according to the households’ elasticity of substitution between present and future consumption and to their subjective discount rate (p. 567 sq). Such justifications derive from the injection of psychology into economics which was initiated by marginalists at the end of the nineteenth century. This approach risks reducing the policy debate to the introspection of something akin to a naturalized collective psyche. Piketty rightly refutes some of these arguments, but he hardly proposes any alternative analytical approach.

If we confine ourselves to the literary references mentioned by the author, social

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<sup>22</sup>For example, p. 671, when it comes to explaining how the “domination of rentiers” represents a threat to democracy, the author merely recalls that our democracies are built upon meritocratic “belief” and “hope”.

tensions generated by the unequal distribution of capital can be reduced to the dilemma of such an ambitious character as Eugene de Rastignac<sup>23</sup>: should he marry a rich heiress or content himself with the income due to his personal effort and merit?<sup>24</sup> Anguish stirred up by analogous dramas in John Willoughby or Catherine Sloper is mentioned too, but it hardly comes to the social struggles present in *Les Misérables*, *Germinal*, or Charles Dickens' deeply social works. Dickens left home in 1824 when he was 12 years old to work ten hours a day in a factory in order to pay his father's debts. This is certainly not the same motivation as that of Rastignac in Balzac. Above all, Piketty does not really create causal links between the possibility of social conflicts and the economic system logic. Boyer (2013)<sup>25</sup> rightly underlines the absence of distribution conflicts around the wage-labour nexus. Without such a dichotomy between the economic sphere and other social spheres, indeed, neither of above-mentioned "fundamental laws" would make sense. We are thus far from an attempt to understand how these two spheres interact in the manner of Max Weber, Karl Polanyi, or Robert Boyer himself. This is surprising given Piketty's strong plea that ends up Piketty (2014a), in favor of an economy open to other social sciences (p. 945). Such an appeal is certainly welcome in the context of current academic economics, which so often promotes the fiction of an abstract market "disembedded" from society. The plea, however, sounds like an invitation for the author himself.

As far as Cambridge (U.K.) economists are concerned, their essential criticism of neoclassical economics went much further than any fear of seeing social conflict break out. The Cambridge (U.K.) criticism implies, indeed, that the production *function* (Cobb-Douglas, CES, or any other) linking produced goods and services to "production factors" is not the right functioning state of an economy. This basic criticism seems not to be considered by Piketty. Otherwise stated, in the same way as there is no such thing as "capital" (in the far-reaching sense which Piketty gives to it), there is likewise nothing akin to an aggregate "production function". This renders the whole apparatus of Piketty, as well as of most neoclassical economics, very fragile indeed. Moreover, through the endorsement (although incidental) of the neoclassical viewpoint of the Americans, Piketty paradoxically agrees that the British Cambridgians he opposes are right: the dynamics of capital accumulation à la Kaldor which he proposes to infer from data he himself helped to design do not contain any internal contradiction. As Piketty himself acknowledges, such capitalism can very well flourish with a growing  $r_t - g_t$  gap. Democracy may suffer from this,

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<sup>23</sup>A fictional character from *Le Père Goriot* (1835) by Honoré de Balzac.

<sup>24</sup>A more substantial analysis of "Balzacian economics" is to be found in Wurmser (1964).

<sup>25</sup>Loc. cit. note 6.

but as contemporary China illustrates, a non-democratic regime can work rather well with a certain openness to capitalist features.<sup>26</sup> Most importantly, Piketty never makes the link between finite natural resources and the possible collapse of a capital accumulation process principally based on the systematic exploitation and depletion of those resources.

In a general way, Piketty's analysis of the neoclassical position in the book remains ambiguous. Empirical facts collected in the book undeniably contradict Kuznets' well known theories and naïve interpretations of Kaldor. But the interpretation of the facts proposed by the author himself seems to reproduce Kaldor's very same postulates, and to be based (sometimes explicitly, sometimes inferred) on the most traditional neoclassical corpus. So, for instance, international disparities in the growth of inequalities between high and very high incomes rather lead to an interpretation which leads away a view that these incomes are identified with the marginal productivity of top-level managers. But we still are told by the author (p. 569) that "the general intuition carried by [...] the theory of marginal productivity [...] cannot be entirely wrong". Likewise, Piketty mentions (p. 214 sq) the Ricardian equivalence —an argument unduly attributed to David Ricardo.<sup>27</sup> Piketty challenges this celebrated equivalence by merely criticizing macroeconomic models with a representative household (in such models, indeed, the fact that a small minority of households benefits both from tax exemptions and public debt service does not show up). Nevertheless, there are neoclassical equilibrium models with heterogeneous households (some are indebted, some are lenders) where the Ricardian equivalence can be established, cf. e.g., Dubey and Geanakoplos (2003). Therefore Piketty's criticism of the Ricardian equivalence fails to reach its target.

In the same fashion, the author's position vis-à-vis Cobb-Douglas functions remains ambivalent. He rightly points out (p. 346) that his own empirical endeavour is hardly compatible with such a modeling, but then does not recognize that his "second fundamental law" presupposes long-term convergence of parameters  $\beta_t, s_t, g_t$ . If such a convergence were established, and if the modeling of the productive sector by a production *function* were deemed relevant, this would imply that the choice

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<sup>26</sup>Needless to say, there exists an abundant literature which, contrary to North-American neoclassics, attempts to account for internal destabilization effects (in the absence exogenous shocks) caused by some endogenous logic: Think of Kalecki and Goodwin's cyclical models, Kaldor's cumulative processes, Pasinetti's production dynamics, Minsky's financial instability, Keen's circuit models, etc.

<sup>27</sup>It was actually formalized by Barro (1974), who dismisses any increased public expenditure on the grounds that it would be precisely compensated by an increase in households' savings, the households rationally anticipating the unavoidable following tax rise.

of a *Cobb-Douglas* function boils down to an accounting tautology (cf. footnote 3). Thus, despite its author's denial, the whole setup remains quite close to the standard neoclassical *Weltanschauung*.

## 4.2 What about natural capital and credit ?

Eventually, there are two blind spots in Piketty's inquiry into capital. The first one concerns the role of energy and natural resources in the growth process. Nothing prevents the residual obtained in estimation of fundamental law (4) from reflecting, in reality, the neglected presence of "natural capital". The author is aware that, without an energy transition, growth (even at 1.5% per year) will not occur in Europe or Japan, regions so dependent on fossil fuels. But since "natural capital" is out of his scope of inquiry, he does not draw any economic policy conclusions from this observation. He thus contents himself with giving an account of contemporary debates around discount rates required for valuing current sacrifices needed to preserve our natural capital, and even acknowledges that the discount rate is far from being a key issue (p. 933 sq). A more thorough investigation of the role of natural resources in the growth process would more than likely lessen the role played by reproducible capital accumulation in the dramatic improvement of Western lifestyles since the nineteenth century. This is commonsense: natural capital existed long before growth took off through successive industrial revolutions.<sup>28</sup> As regards growth, the real driver for past growth was obviously the progressive introduction of fossil fuels into the industrial innovation process and use in consumer goods. Might it be that energy resources as the engine of growth across the last two centuries are what gives economic value to capital?

Second, Piketty also fails to address the issue of credit, and money creation by private banks. Insofar as the underpinning HDS model is moneyless, the role played by credit in the constitution of investment disappears from the analysis. This "omission" is at the very least problematic in a work that is entirely dedicated to capital. When Piketty tackles the issue of money creation (p. 900), he only examines money creation by central Banks, as if he were agreeing with the myth of money multiplier.<sup>29</sup> Acknowledging that endogenous money creation through bank credit is a key element of our economies, both for growth and for primary distribution (before redistribution) of incomes and wealth, amounts to understanding that the best way to run

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<sup>28</sup>See, e.g., Giraud and Zeynep (2014) for an account of the impact of energy consumption on growth.

<sup>29</sup>As a matter of fact, Schumpeter, for whom endogenous money creation plays a decisive role in economic dynamics, seems to be absent in Piketty's thinking.

against the growing disequilibria in capital distribution is to control the source of money creation, i.e., not only Central Banks but also commercial banks. This leads us to quite another kind of “useful utopia”, different from taxation of capital. An interesting example of this idea is the Chicago Plan advocated by Irving Fisher and Maurice Allais, among others—a way to recreate public oversight of money creation, cf. Benes and Kumhof (2012). While capital taxation addresses the issue after primary distribution, money creation control tackles it *ex ante*. If energy and credit are two essential ingredients in the economy, Piketty ignores them because growth is actually not the primary issue he addresses (as it would not draw the attention of a tax civil servant, as long as it generates tax revenues).<sup>30</sup>

This point leads us to ask a last question: how will *Capital in the Twenty-First Century* help economics to rethink its conceptual framework? In my opinion, the prime virtue of the book is to help some economists out of the trouble where the neoclassical illusion that distribution does not matter drove them. Against such a claim, Piketty’s work demonstrates that income and capital inequalities do really exist, and they are widening further.

## 5 How to think about inequalities?

Despite all the ambiguity surrounding the very definition of  $K_t$  (hence,  $\beta_t$ ) and the vulnerable grounds of the associated theory, the interest of *Capital in the Twenty-First Century* from a policy viewpoint lies in highlighting the fact that since the 1970s the  $\beta_t$  ratio is rising again. The principal merit of the book is to recall this recent trend, against those who try to deny the massive evidence. At the same time, currently noted levels of ratios  $\beta_t = K_t/Y_t$  (between 4 and 6.5) are certainly higher than in 1970 (between 2 and 3.5) in eight industrialized countries,<sup>31</sup> but they remain largely inferior to those noted in the eighteenth and nineteenth centuries (between 6 and 7). Can this ratio reach the level of the two first Industrial Revolutions over the next decades? The answer is yes, if we believe, as Piketty does, that nothing but exogenous shocks emanating from the socio-political sphere can stop this capital accumulation logic. From most evidence, it seems highly probable that over the next decades, patrimonial inequalities will keep on rising in most industrialized countries. What is at stake is to know whether the framework proposed by Piketty helps understand this phenomenon.

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<sup>30</sup>By contrast, the role David Graeber grants to 5 millennia-old debt-fueled social conflicts allows him to put monetary credit in the foreground, cf. Graeber (2013).

<sup>31</sup>The U.S., Germany, the U.K., Canada, Japan, France, Italy, Australia.

Likewise, equation (2) is read by Piketty as evidence that the the gap,  $r_t - g_t$ , will continue. According to (2), however, if  $r_t$  does not to decrease while  $\beta_t$  increases,  $\alpha_t$  has to increase too. But while the  $\alpha_t$  ratio increased from the 1970s to the beginning of the 1990s (from 15-22% to 22-32%), it has been stagnating or decreasing since then. It is hard, in this context, by mere empirical observation, to infer from this data point that the ratio,  $\beta_t$ , is bound to irremediably increase in the future. Finally, in the U.K. and in France, the “pure” rate of return on capital,  $r_t$ , has been decreasing since the 1950s (p. 318, charts 6.3 and 6.4). It even reached in 2010 its lowest level since 1770. What objective elements would allow us to infer that it should now increase? Or that it cannot fall under 4%? Is it only because it has never reached this lower bound ? How can this question be answered, as long as we do not have an explanation (or theory) for the formation of  $r_t$ ?<sup>32</sup>

Summarizing work done by the author for the past decade, the third part of Piketty (2014a) shows that the social divide is no longer solely between capital owners and employees, but also across categories of employees. This tendency is most observed between top-level executives whose earnings have skyrocketed —though at variable speeds across countries— and the rest of wage employees. In the U.S., for example, the old divide between an egalitarian North and a pro-slavery South seeps through from original structures of inequalities: in 2013, the U.S. are less unequal in terms of wealth than Europe in 1913, but they show higher income disparities. This obviously raises the question whether these income inequalities come from the growing gap in mastery of technological progress between a skillful elite capable of following the acceleration of innovations and a more “backward” worker population (e.g., as asserted, by former Chicago economist Raghuram Rajan in a logic that approaches neoclassical theory of productivity), or if they are the consequence of a decline in the tax rates of top incomes (as claimed by Piketty), or possibly even a malfunctioning in corporate governance structures. This inequality upsurge had already been documented more than ten years ago, e.g., by J. K. Galbraith, cf. Galbraith and Ferguson (1999) and Galbraith and Hale (2014).<sup>33</sup> One question is worth asking about the way Piketty reports his own findings: what role played income distribution in the financial crash of 2007-2009? The author explicitly questions the thesis that the rise in inequalities was (at least partly) at the origin of the financial crisis, but unfortunately does not explore further the thesis —something this reader

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<sup>32</sup>And we saw that Piketty’s framework can hardly provide such an explanation.

<sup>33</sup>As it is rightly emphasized by J.K. Galbraith in his own report on the book (<http://www.dissentmagazine.org/article/kapital-for-the-twenty-first-century>), and contrary to what Piketty claims, he is not the first one to track long-run measures of income inequalities.

would have found interesting, cf. e.g., Kumhof and Rancière (2011).

The concentration of inherited wealth has been progressing for some decades. Today, across the 8 countries studied by Piketty, the top wealth-owners decile owns between 60 and 70% of wealth; the top centile owns between 20 and 30%. The “lower” half of citizens owns approximately no wealth, as it has always been the case in the past, while the 40% above the patrimonial median own between 20 and 30% of wealth. According to the author, this last aspect is the striking stylized fact of the 20th century: the birth of an inherited wealth middle class, a phenomenon absent until the end of the Second World War. Nevertheless, these documented realities are not suitable for hasty generalizations. In 2010, patrimonial inequalities in France are still far from their pre-First World War levels, or their even 1810 levels (cf. p. 542, charts 10.1 and 10.2.).

Some of the author’s fundamental beliefs may allow us to grasp better the originality of his work. Faced with the proposition that the growth rate,  $g_t$ , will never rise above a small 1.5% annual average, some neoclassical macroeconomists would answer that human capital constitutes the resource which will offset the demographic weaknesses of our countries. Piketty, however, does not believe in human capital, and he wonders if it is not an “illusion” (p. 353). His objection is rather simple. The important role of education should not mask the key role of (non-human) capital and of its unequal distribution in growth calculations. This reminder is surely welcome, and we will come back to it in the conclusion. It must be stressed, however, that the importance granted to measuring different forms of human capital by the World Bank, the OPHI or the OECD<sup>34</sup> is not a mere attempt to push the “come back of capital” into the background. It is also a welcome endeavour to rethink our categories of economic and welfare measurements. It has become clear that no change in economic policies can be discussed within democratic societies as long as we do not have new categories to understand the social and economic realities in which we live. The relatively poor measures like GDP or national income need revising or entirely recasting in order to change the frame of reference.

Some new analytical frameworks now under study, strive to understand social capital by exploring precisely the pathways Piketty does not follow. These are pathways leading from inherited inequalities (and so many other issues) to the breakdown of the social fabric and of basic human relationships. Those devising these frameworks believe it possible to investigate the destructive effects of certain institutions in terms of social links, without instrumentalising “social capital” in view of a “suc-

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<sup>34</sup>Cf. e.g., Giraud et al. (2012). Of course, we should distinguish between “human capital” and “social capital”, between instrumental approaches and others — cf. e.g., Knack and Keefer (1997).

cessful” integration (cf. e.g., Putnam (1993)) and while paying careful attention to structures of power originating from differences in symbolic capital, cf. Richardson (2013).

## 6 The global tax on capital

In the fourth part of Piketty (2014a), the author analyses a proposal for a progressive tax on capital that would be enforced with an identical rate and base at a global level. The proposal is not new: it was first formulated in 1943 by Michael Kalecki in Kalecki (1943). Piketty’s suggestion for a global tax follows logically from what was said previously, and it does have many advantages. A tax uniformly collected on all forms of capital and at a potentially variable rate according to the observed return (following equation (2)) would allow us to correct two shortcomings of the present situation.

The first shortcoming is the way in which diverse implemented tax rates presently operate, depending on the nature of capital. Berlusconi’s and subsequently, Monti’s Italy avoided imposing substantial tax rates on financial capital, largely out of fear of the consequent massive capital flight to Switzerland or Germany. As a consequence, Italy choose to levy heavier taxes on housing assets at the high risk of perpetuating obvious social injustices. With Piketty’s scheme, all forms of capital would be taxed at the same (progressive) rate. Exactly the same argument was already put forward by Kalecki, in the 1940s’.

Secondly, capital taxation is more appropriate for a collective contribution to the common good than individual consumption taxes like the French Value-Added Tax. Consumption taxes are perpetually questioned on the basis of debatable distinctions between essential consumer goods, luxury goods, “intermediary” goods, etc. Taxation on capital and income saves the state having to give its opinion on citizens’ use of their wealth. Although the book remains vague on this point, other declarations by its author seem to indicate that he does not recommend a world sovereign tax authority but rather coordinated national efforts, administered by each country on the basis of Treatises.

Let me end this review by some comments on these policy issues. First, it is pretty clear (and the author is perfectly aware of it) that implementing such a tax regime would require massive coordination between a great number of nation-states. Otherwise, free-riders would survive in the global system, and systematic tax evasion would emerge toward countries lagging behind in the implementation of the global



scheme. Is such coordination within reach in the decades ahead? Piketty acknowledges that such is not the case. Instead, he views his proposal as a “useful utopia” (p. 836).

To reverse the current spiral in capital (mal-) distribution, however, quite a number of intermediary stages could be considered before a global capital taxation system. Among these, an important one is implementing an apportionment rule to combat tax evasion practiced by multinational industrial corporations via transfer pricing, cf. Giraud and Renouard (2012) (GR henceforth), Prop. 16. Corporate tax evasion seems to remain a blind spot in the analysis of many tax experts. This is quite like the contemporary issue of immaterial capital valuation in firms’ balance sheets, cf. GR, Prop. 15 and 16. The advantage of the apportionment rule is that it is already implemented in a geographical area as wide as Europe – the United States. *This* proposal is *really* within Europe’s reach, and should not be viewed as a utopian scheme. Such changes could be part of a wider reflexion on the implementation of progressive taxation on corporate earnings, cf. GR, Prop. 14-17. The North American apportionment rule makes it possible to implement a tax on transnational firms’ profits according to their revenue, payroll and actual investments. This would bypass tax evasion schemes based on transfer pricing. In Europe, the implementation of the apportionment rule could rely upon the newly compulsory Exchange of Goods and Services Declarations (EGD and ESD).

Likewise, Piketty emphasizes that the political will to implement a global tax on capital could provide the required impetus for national tax administrations to adopt more transparent taxation practices, and even to set up a global registering of private wealth. This is a welcome utopian approach in the academic world where professional economists are sometimes keen to justify the most cynic views. Again, before we reach complete tax administrations transparency throughout the world, many intermediary steps could be taken, with greater chances to provoke essential and useful public debates. Among these steps are public control of the databanks of the two clearing houses Euroclear (Belgium) and Clearstream (Luxembourg) which would probably enable European governments to track easily transactions linked to tax evasion or money laundering on European territory, see Robert and Backes (2001).

Third, Piketty seems to believe that a tax on capital will be enough to solve banking crises. He illustrates his point with the Cypriot crisis where, according to him, the wavering of European authorities came from their ignorance of asset registration in Cyprus (p. 553 sq). It would be naive, however, to believe that a capital tax would allow a country to pay off one’s debts after a major banking crisis.

The Icelandic banking sector had accumulated 7 times the country's GDP before collapsing in 2010. It was probably more than the total capital of Iceland. Taxation on national capital would have been ineffective. Faced with banking crises, we must understand that acting *ex post* is always acting too late. Prevention is a far better policy, and this requires financial regulation, an issue absent in Piketty's book. Yet, the pattern of capital distribution depends upon it—all the more so in that our economies are much more financialized.

Fourth, the global capital tax proposal will inevitably stir up strong resistance. In the end, what will guarantee that annual economic growth will be on average 1.5% over the next decades? Will this average not be accompanied by huge volatility, analogous to what is happening in the Euro-zone since a couple of years (+3% in Germany vs. -6.5% in Greece)? Would the countries that implement progressive capital taxation not risk losing their last pawn in the game of promoting growth? Unfortunately, Piketty's framework does not answer these legitimate questions, as it does not contain any extended analysis of the growth-capital relationship but only an account of the meager neoclassical narrative inspired by HDS, Piketty and Saez (2013) propose a theory of optimal capital taxation, but they take the rate of return on capital,  $r$ , as an exogenous datum. Furthermore, the theory relies entirely upon neoclassical premises, the great analytical vulnerability of which has been recalled in footnote 10 *supra*). Responding that the fiscal burden during the "Trente Glorieuses" did not slow down growth—which is, of course, true—does not prove the case.

Such an approach would have lead the author to consider seriously the various "peaks" of natural resource utilization, and hence to start thinking about the way our economies will have to learn selective degrowth in the coming decades.<sup>35</sup> Piketty's book is not concerned with the possible conditions of reverse growth either. Piketty implicitly believes that we can take it for granted in order to focus on the least unsatisfying way of redistributing its fruits, if ever there are any. Faced with primary distribution inequalities before taxation, the "fundamental laws of capitalism" seem to have nothing to offer.<sup>36</sup> One reply to this criticism often put forward by Piketty

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<sup>35</sup>Fortunately, lucidity forces Piketty to take note of the fact that we won't experience the growth rates which characterized the thirty years following WWII any time soon. This is a sobering warning at a time where some economists are championing the role in future growth of technological progress. One chapter (p. 159) of the book is rightly devoted to convincing the reader that a society with a 1% yearly *and per capita* growth rate is rapidly changing. However, the median scenario of the United Nations upon which the whole book relies is an annual growth rate of 1.5% *full stop*—which makes a *big* difference.

<sup>36</sup>By contrast, Wilkinson and Pickett (2010) stress how the reduction of primary inequalities, via democratization of the firm in particular, is a vital imperative for our societies' health. And Gadrey (2013) reminds us: believing that a fair fiscal redistribution is possible in a society that

is the following (cf. Piketty (2014b)): the tax system does not only impact the secondary distribution of wealth, but also its primary distribution. For instance, the reduction of the tax burden on incomes, at least in the U.S., which started in the 70s', must have been responsible for the huge wage increase of North-American top-managers. This argument, however, is again paradoxical, to say the least: were it true, it would mean that an increase within taxes must induce a decrease in wages... The change in corporate governance of big companies seems a much better explanation of the explosion of salaries of top-managers. And such a change is linked with much deeper structures within society than the mere tax level.

## 7 Conclusion

In conclusion, the analytical criticisms of this paper are by no means a denial of the considerable interest of the historical and political perspective brought by *Capital in the Twenty-First Century*. It is well possible to rightly identify important economic phenomena with a fuzzy theoretical apparatus. This opens a research avenue consisting in formulating the "right" conceptual framework where the data accumulated in Piketty (2014a) and elsewhere can be interpreted. So far, such a framework is lacking.

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creates inequalities is not a utopia, it is an illusion. For example, tax increases as such have never prevented one to double its wage/salary, just to "compensate"...

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