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# Inequality: what is at stake 2/4

## Pro-Piketty and Anti-Piketty: A review of the literature in 20 topics

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Document for the exclusive attention of professional clients, investment services providers and any other professional of the financial industry

"Piketty has transformed our economic discourse; we'll never talk about wealth and inequality the same way we used to do"

*Paul Krugman, New York times May 8, 2014*

"Although Piketty's book (Capital in the 21st century), has been praised by those who advocate income redistribution, his thesis rests on a false theory of how wealth evolves in a market economy, a flawed interpretation of U.S. income-tax data, and a misunderstanding of the current nature of household wealth"

*Martin Feldstein, 2017*

"Piketty's social theme is a narrow ethic of envy. His politics assumes that governments can do anything they propose to do. And his economics is flawed from start to finish. It is a brave book. But it is mistaken"

*Deirdre N. McCloskey, 2014*

# Inequality: what is at stake 2/4*

## Pro-Piketty and Anti-Piketty: A review of the literature in 20 topics

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May 2021

*(*) This article is a review of the literature on the "Piketty vs. anti-Piketty" debate. It is part of a series of four Discussion Papers on inequality. It complements in particular the Discussion Paper on "inequalities and poverty: ongoing challenges" to be released soon.*

## Abstract

No one is disputing that Piketty's books are groundbreaking, that his research and his team's research are fundamental, or that their databases and reports are invaluable. Moreover, this research puts economics back in history, which is highly commendable. According to Piketty, the relatively egalitarian world of the "Thirty Glorious Years" following the world war II is being replaced by once again very unequal societies, with a force of inertia notably in terms of wealth inequalities. He concludes that the best way to counter this trend is to implement a progressive global capital tax. However, the World Bank, the IMF, multiple academics, Fed surveys, and the US Bureau of Labour Statistics among others have all challenged Piketty's findings on inequality. The main arguments of the anti-Piketty camp refer to many different fields. Problems with data and methodology, tax cuts, interclass transfers, human capital, liberalisation of the US economy, facts on heritage, the role of private debt, income volatility and the instability of the richest 1% segment are all factors that weaken or disprove Piketty's findings. The theoretical framework is also debated, especially regarding the three fundamental laws of capitalism: i) the share of capital income in total income equals the rate of return on capital multiplied by the capital income ratio (Law # 1); ii) the rate of growth of national output equals the savings rate out of national output (net of depreciation) divided by the capital-output ratio (Law # 2), and iii) the rate of return on capital systematically exceeds the rate of growth (Law # 3). As a consequence, all Piketty's recommendations are also under scrutiny. This article is a review of the literature on the main debates around Piketty's theses.

**Keywords**: inequality, Piketty, anti-Piketty, income inequality, return on capital, extreme inequality, heritage.

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# Executive summary

1. No one is disputing that Piketty's books ("Capital in the 21st century" and "Capital and ideology") are ground-breaking, that his research and that of his team (including E. Saez, G. Zucman, F. Alvaredo and L. Chancel) are fundamental, or that their databases and reports (https://widworld/) are invaluable. Moreover, as noted by a former planning commissioner (P-Y Cossé), this research "*puts economics back in history*", which is commendable. Piketty's book rests on **three pillars**: 1) the idea that there is a constant, relentless uptrend in the share of wealth going to the richest members of the population; 2) the idea that r > g leads to a scenario in which the rich gradually absorb all economic output; 3) the idea that a wealth tax is a logical response to these conditions. This article is a review of the literature on the "Piketty vs. anti-Piketty" debate. It is part of a serie of 4 Discussion Papers on inequality. It complements in particular the Discussion Paper on "inequalities and poverty: ongoing challenges" to be released soon.

**2. The three fundamental laws of capitalism.** The book "*Capital in the 21st century*" uses as a framework for its data what Piketty calls the "*two fundamental laws of capitalism*". The first law (the "profit share law") states that the share of capital income in national income (α) is equal to the average rate of return on capital (r) multiplied by the ratio of the capital stock to national income (ß), i.e. **α = r.ß**. The second law (the capital income law) provides that in the long run the ratio of the capital stock to income (ß) tends in the long run towards the ratio of the savings rate (s) to the growth rate of the economy (g), i.e. **ß = s / g**. Piketty estimates that the ratio of capital to income ß was 6 or 7 in the 19th century, that it dropped to 2 after World War II, and that it is now back to a level close to the 19th century with a value of 5 or 6. Moreover, Piketty finds that over a long period the average return on capital (r) is greater than the growth rate of the economy (g): **r > g**. This inequation ("*the central contradiction of capitalism*", according to Piketty) implies that the owners of capital get richer more quickly than the rest of the population.

**3. Piketty highlights the resurgence, as massive as it is recent, of the growing weight of capital (relative to economic activity) and of strong inequalities in the distribution of income.** The relatively egalitarian world of the "Thirty Glorious Years" (1945 -1975) is being replaced by once again very unequal societies, with a force of inertia notably in terms of wealth inequalities. According to Piketty, these developments respond to a logic of capital accumulation that has been effective for a long time, but the effects of which were delayed, in the 20th century, by the succession of wars, tax policies not very favourable to rentiers and strong growth in the post-war period. As these three favourable factors more or less disappeared in the 1990s, it is to be feared that inequalities will widen very sharply. Piketty concludes that the best way to counter this trend is to implement a progressive global capital tax.

**4. Many criticisms have appeared on the theoretical framework** used by T. Piketty. Its use of neoclassical theory, its "laws" on the share of profits and on the determination

of the capital / income ratio would be, according to some detractors, three major weaknesses of his approach, and therefore of his conclusions and recommendations.

**5. Multiple studies have picked apart Piketty's thesis and highlighted the mistakes made by the author (according to them), some of which can be attributed to data and methodology, the causality of relations, the definition of capital and others economic or ideological in nature.**

**6. The integrity of the data** used in Piketty's research has been challenged (R. Sutch (2017), C. Giles (2014), C. Goes (2016), etc.).

**7. The causality of the two fundamental "laws" of capitalism advocated by Piketty is not unanimous either**. According to Piketty's "law", the capital income share ($α_t$) depends on the average rate of return on capital $r_t$ and the capital / income ratio $C_t$ / $R_t$ (noted $ß_t$): $α_t = r_t. ß_t$. It is usually written as: $r_t = α_t / ß_t$, i.e. the classic definition of the rate of profit. Even if this equation is a tautology (which Piketty readily admits), it is poorly posed in Piketty's book. The rate of return on capital is in reality a result of the production process, and not something given elsewhere, a sort of guaranteed rate of profit, which it would suffice to apply to capital. Piketty choses a different causality.

According to the second "law", the capital / income ratio ß depends on the savings rate s and the growth rate of the economy g, i.e. $ß = s / g$. Note this relation was initially used by Harrod and Domar in the 1940's as $g = s / ß$. Piketty has also inverted this relation to propose his second "law". The status of "fundamental law" accorded to it by Piketty comes from the empirical observation. Krusell and Smith have shown that this relation is based on an extreme and unrealistic assumption about the savings behaviour of agents. Piketty postulates that "the saving rate does not decrease as much as growth decreases", an essential argument in his thesis. Boyer (2014) wonders about the relevance of the equation ($β = s / g$) and underlines in particular that in the borderline case of an economy in stagnation ($g = 0$), the equation becomes absurd. With this equation, the economic force that produces very long-term growth is only the accumulation of capital. Neither raw materials (especially energy), nor human capital, nor institutions ... contribute to growth, except through their influence on what drives capital over the very long term. To use the expression of Giraud (2014), "*what intelligence of capital does Piketty offer us*?"

**8. The central assertion of Thomas Piketty's "Capital in the 21st century" is that the rate of return on capital (r) is greater than the rate of income growth (g).** According to Piketty, the basic inequality $r > g$ means that, even if capital-holders reinvest just a fraction of their capital income, and their wealth (and associated income) will grow faster than the rest of the economy. As a result, they will end up owning almost everything while the vast majority of those living only on the income from their jobs will basically have nothing. Inheritance accentuates this inequality and the rich can be seen as rentiers. According to Piketty, growing inequality is locked into the very DNA of capitalism.

**9. The $r > g$ inequality is widely disputed**. Some authors even consider the inequality $r > g$ is nonsense in the long run. It is even a misunderstanding (Delsol (2017).

It is evident that the fortunes of a few cannot increase indefinitely in proportions much greater than those of growth. Data tend to confirm that r-g is declining with economic development and might turn definitely negative should we extrapolate long data (Schmelzing (2020)). And even if r > g, it does not necessarily mean that inequality will rise. Milanovic (2017) explains that the transmission mechanism between r > g and higher income inequalities requires conditions with low probability to be met. Acemoglu - Robinson (2015) also confirms that the rule r > g does not necessarily imply an increase in inequalities. The quests for general laws ignore both institutions and politics, and the flexible and multifaceted nature of technology, which make the responses to the same stimuli conditional on historical, political, institutional, and contingent aspects of the society and the epoch. Any plausible theory of the nature and evolution of inequality must include political and economic and monetary institutions. In other words, the income inequality observed in many advanced economies over the past decades can be explained by factors other than the gap between r and g.

**10.** The increase in the percentage of capital in long-term income can be single-handedly attributed to higher prices in the real estate sector (M. Rognlie (2015)). In other words, **take real estate out of the equation and Piketty's findings cannot be replicated**.

**11. Piketty's definition of wealth does not include human capital**, owned by the workers, which has grown in rich countries to be the main source of income. Excluding human capital from capital artificially forces the conclusion Piketty wants to achieve, that inequality has increased, or will, or might, or is to be feared. McCloskey noted that "*the neglect of human capital on the Problems side of the book is doubly strange because on the Solutions side Piketty recommends education and other investments in human capital*".

**12. Piketty did not include risk and income instability when calculating return on capital**. According to research that does include these factors (Auerbach-Hassett (2015)), the apocalyptic r > g 'exploding wealth inequality' scenario does not look especially likely. In fact, the rate of return after tax using the highest marginal tax rate is significantly lower than the after-tax rate. In addition, the alternative rate of return after tax is systematically lower than the GDP growth rate.

**13. Other research has shown that rents have a bigger impact on the rise of inequality than return on capital**, as opposed to what Piketty suggests (Furman – Orszag (2018).

**14. Newer evidence suggests that much of the rise in earnings inequality represents the increased dispersion of earnings *between* firms rather than *within* firms** (Barth – Bryson – Davis – Freeman (2014), Song – Price – Guvenen – Bloom – von Wachter (2019), Furman – Orszag (2018)).

**15. Piketty's methods have also come under fire**: reading his research and the looking at the host of data provided, there is a strong sense that inequality has increased. That said, critics are sceptical because Piketty does not conduct basic regression analysis

to validate his proofs. He evades the causation problem (is the rise of inequality a cause or effect?). With the help of econometric testing on several countries, some authors (Acemoglu-Robinson (2015)) have found an insignificant negative correlation between the gap between return on capital and the growth rate (r-g) and the rise of inequality.

**16. It is also important to stress that Piketty uses income before redistribution in his proofs**. However, the very purpose of tax schemes and employee benefits is to reduce basic inequality (or inequality in the distribution of primary income).

**17. Actually, given that tax schemes and employee benefits are constantly evolving, it is undoubtedly better to measure the change in inequality using consumption expenditure rather than income**. However, a survey conducted by the American Enterprise Institute showed that, between 2000 and 2010, the consumption levels of different population quantiles were stable in the US. This finding is very different from Piketty's.

**18. Thanks to the rise of progressive tax, the richest members of the population have seen their income grow much less than suggested by Piketty.** If all taxes are taken into consideration, the effective tax rate of the richest 10% has climbed, but has fallen for the remaining 90%. According to Auten-Splinter (2019), inequality changed very little between the 1960s and 2015: the share going to the richest 0.1% and the richest 10% remained stable (3.5% and 30%, respectively).

**19. All data disprove Piketty's thesis that the rich inherited their wealth**. Statistics don't lie: between 1989 and 2013, 77% of wealth was and just 23% can be considered as earned from inheritance (Wolff (2017)). 83% of the richest 1% are self-made men and just 17% inherited their wealth! This completely contradicts Piketty's assertion. Wealth is not set in stone and thus does not tend to grow indefinitely. We would also point out that of the 400 wealthiest Americans (Forbes (2019)), 254 founded their own company and nearly half did so by the age of 30 (85% by the age of 40).

**20. The people Piketty overlooked.** Of the 200 wealthiest Americans (wealth > $3.3 billion), 115 came directly from the upper middle class, the working class and the underprivileged class, i.e. 57% of the panel (versus just 12% for rentiers). These are the people overlooked by Piketty.

**21. The fact that composition of the richest 1% (or 5% or 10%) is not stable over time (a new wealth is created, and another wealth is destroyed) also significantly alters Piketty's findings.** Rank and Hirschl (2015) published a study on mobility among the wealthiest 10%. This research contradicts Piketty's thesis, whereby the rich inherited their wealth, and continue accumulating wealth their whole lives. According to Rank and Hirschl, 53% of Americans have been counted during their lifetimes, for at least one year on average, among the wealthiest 10% (in terms of assets), 11% of Americans have been counted among the wealthiest 1% for at least one year, and by the age of 60, 70% of wage earners will spend at least one year in the top 20% of the income bracket.

**22. Private debt has part of responsibility in the rise of inequality**, as emphasized by D. Stelter (2014). Piketty considers the role of debt to be neutral in the evolution of inequalities. It takes into account net worth, that is, the total wealth reduced by debt. In doing so, Stelter considers that he sees only one symptom and ignores the real cause of inequality: the increase in debt over the past 30 years. People who have access to cheap money and financial markets have been able to take on debt to increase their wealth. According to Piketty, the real cause of the increase in wealth inequalities is that the return on capital exceeds the rate of economic growth, and the wealthy earn extra returns because of their management skills. Stelter's analysis is different: wealth inequalities stem from the cheap money policy orchestrated by central banks and the increase in debt. It is access to (cheap) credit that feeds the growth of wealth.

**23. Piketty's solutions under question**. He does not describe the costs of his redistributive program in any way and rejects entirely the consequences that an increase in taxes on income and wealth can have on entrepreneurs and risk taking. Arriving at "confiscatory" tax rates of income and property has been the subject of very many criticisms, in particular on the denial of meritocracy and on the sincerity of tax evasion or brain drain to more tax-friendly countries. Asked about the possible tax evasion that the tax rates he proposes would produce, Piketty argues that these ideas are "*fantasies*".

**24. Thomas Piketty stresses that returns on capital rise faster than growth, then entrepreneurs turn into rentiers and the past devours the future**. Allègre considers the causality is the opposite: "*it is because entrepreneurs manage to transform themselves into rentiers that they can derive an excessive return on their capital*". The difference is significant, in terms of results and analysis, but also and especially in terms of public policy recommendations. **The ex-post taxation of capital** (already proposed by M. Kalecki in 1943), **even when it is deemed necessary, would then perhaps only be a second choice**: *"we must first remove the constraints of scarcity and be concerned with the definition of property rights as well as of the rights of owners and non-owners*".

**25. Rich people are part of the solution, not necessarily the problem.** Considering the role of redistribution, wealthy people are essential. How to ensure that the enrichment of some can best serve the interests of a collective without using confiscatory measures? This is the ambition of public policies. Piketty thinks about the appropriation of wealth but forgets the development of wealth. This is why his proposals are unrealistic. And without the protection of private property, there is no innovation; without innovation, no growth.

**26. Inequalities follow long cycles**. While T. Piketty considers the reduction in inequalities that took place between World War I and 1970 is linked to a political awareness, W. Scheidel (2017) considers it is linked to the shock wave of the 1914-1918 war and the communist revolution. Likewise, the current phase of rising inequalities would be linked to the situation of peace which reigns since the World War II. He puts in perspective all the periods of reduction in inequalities in the context of long cycles.

The history of inequality can be summed up as long periods of growth in inequality alternating with shorter periods of reduction - often brutal. Periods of reduction in inequalities correspond to phases of destruction of wealth: he thus puts forward four factors: war, revolution, the collapse of states and pandemics (the "Four Horsemen of Levelling"). When they emerge, they ruin all populations and even more so the populations who hold capital. There are phases of massive reductions in extreme inequalities. A constant throughout history.

**27. In sum, the main arguments of the anti-Piketty camp refer to many different fields.** Problems with data and methodology, confiscatory tax cuts, the importance of interclass transfers, the absence of human capital, the progressive liberalisation of the US economy, facts on heritage, the role of private debt, income volatility and the instability of the richest 1% segment are all factors that weaken or disprove Piketty's findings. The theoretical framework is also debated, especially regarding the three fundamental laws of capitalism: i) the share of capital income in total income equals the rate of return on capital multiplied by the capital income ratio (Law # 1); ii) the rate of growth of national output equals the savings rate out of national output (net of depreciation) divided by the capital-output ratio (Law # 2), and iii) the rate of return on capital systematically exceeds the rate of growth (Law # 3, considered by Piketty as "*the central contradiction of capitalism*"). The inversion of existing relations adopted by Piketty (the inversion of the definition of the rate of profit in Law 1, the inversion of the Harrod – Domar equation in Law 2), and the questionable link between $r > g$ (Rate of return on capital ($r$) > Income growth rate ($g$)) and inequality have been the subject of numerous theoretical and empirical studies which thwarted Piketty's results. Piketty's analysis can also be criticised for focusing on the "1%" enrichment and sometimes exaggeratingly overlooking the "99%" enrichment.

# Introduction

One of the great merits of T. Piketty is certainly to have (re) put the theme of inequalities at the centre of public debates. It cannot be ignored, however, that the work (theoretical but also empirical) on inequalities is not recent. One can quote for example Henry George or Charles Spahr, who, respectively in 1879 and 1896, had studied the distribution of the incomes and the patrimonies in the United States. Sparh had notably shown that 1% of households held more than the remaining 99%, or that 7/8$^{th}$ of households held only 1/8$^{th}$ of the national wealth. Henry George even proposed the abolition of all taxes except taxes on land values (the implementation of a single-tax world). By taxing land values, society could recapture the value of its common inheritance, raise wages, improve land use, and eliminate the need for taxes on productive activity. According to him, a major source of inequalities came from the fact that landowners had the possibility of capturing an undue share of the wealth created. No doubt: T. Piketty is indeed one of their heirs, as well as A. Atkinson, one of the great contemporary authors (and his PhD Thesis director) on the subject of inequalities.

The debate on inequalities had disappeared with the neoclassical theory, which put forward "natural laws". For John Bates Clark (one of the inspirers of the neoclassical theory of capital) and his "followers," in the absence of friction, each productive agent ends up receiving the amount of wealth that he or she has helped to create. Inequalities would therefore be the result of temporary "frictions". In the 1950s, the Kuznets curve (1955) – initially known as the Inverted-U Hypothesis) - put again a heavy blow on the debate. Despite all the reservations expressed by its author himself who considered that his own results came from "*5% empirical information and 95% speculation, some of it possibly tainted by wishful thinking*", the success of this approach was immediate. According to this "law", inequalities first increase, then are reduced with growth. So, it was not a social issue anymore, but a transitory evil. As the inequalities of income and wealth widened, the debate resurfaced in the 1990s and 2000s. The Kuznets curve was replaced by the Kuznets waves. But it was not sufficient.

While inequalities have reduced considerably over time (access to education, health, culture, gender equality, longevity, etc.), extreme inequalities remain strong. Piketty is banking on taxation to correct this shortcoming in capitalism, which he says can only grow.

Inequalities are no longer limited to differences between countries or within countries. It is now a question of inequalities between social classes, between working and retired, between men and women, between employees and managers ... The issue has entered ESG approaches as a factor of discrimination between companies. It is therefore no coincidence that the subject of inequalities is the subject of numerous studies by economists. If this began in the 19$^{th}$ century, we have really witnessed a strong acceleration in research and works over the past fifteen years, the theme becoming central in social and political life.

The book "*Capital in the 21st century*" uses as a framework for its data what Piketty calls the *"two fundamental laws of capitalism*". According to the first "law", the share of capital income in national income (α) is equal to the average rate of return on capital (r) multiplied by the ratio of the capital stock to national income (ß), i.e. α = r.ß. According to the second "law", the ratio of the capital stock to income (ß) tends in the long run towards the ratio of the savings rate (s) to the growth rate of the economy (g), ie ß = s / g.

Piketty estimates that the ratio of capital to income ß was 6 or 7 in the 19th century, that it dropped to 2 after WWII, and that it has now returned to a level close to the 19th century with a value of 5 or 6. He further finds that the average return on capital (r) is higher (over a long period) than the rate of growth of the economy (g), which implies that the holders of capital get richer faster than the rest of the population.

On the whole, **Piketty's book rests on three pillars**:

- The idea that there is a constant, relentless uptrend in the share of wealth going to the richest members of the population;
- The idea that r > g leads to a scenario in which the rich gradually absorb all economic output;
- The idea that a wealth tax is a logical response to these conditions.

With his two books ("*Capital in the 21st century*" (2014) and "*Capital and Ideology*" (2020)), the various research works carried out in his laboratory, but also their databases and reports (https://widworld/), Piketty went much further than his predecessors (and most of his contemporaries). His great merit is that inequality became a central subject in social and political matters. But like H. George or Ch. Spahr with John Bates Clark, T. Piketty very quickly had his detractors[1].

One of the big criticisms is about the central assertion of Thomas Piketty's "Capital in the 21st century". The basic inequality r > g means that, even if capital-holders reinvest just a fraction of their capital income, their wealth (and associated income) will grow faster than the rest of the economy. As a result, if true, they would end up owning almost everything while the vast majority of those living only on the income from their jobs would basically have nothing. Inheritance accentuates this inequality and the rich can be seen as rentiers. According to Piketty, growing inequality is locked into the very DNA of capitalism.

"*Capital and ideology*", published in 2020, completes the previous book, its ambition being not to deal only with rich countries, but also of all countries, and on the other hand to present an analysis of unequal ideologies.

Multiple studies have picked apart Piketty's theses and highlighted the mistakes made by the author (according to them), some of which can be attributed to theoretical

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[1] *A very important academic literature has been published for about fifteen years, and the bibliography presented at the end of the article refers to some of these publications. In addition to academic work, many books have also been published. Among the many pros and cons Piketty's books, some even extol the virtues of inequality (de Vos (2017)), others consider equality a "French fantasy" (de Rosen (2020)) ...*

framework, methodology, data and others economic or ideological in nature. This article (in 20 topics) is a review of the literature on the "Piketty vs. anti-Piketty" debate.

## 1st debate. Piketty's theoretical framework - an abuse of neoclassical theory?

Piketty's body of theory was criticized early on. In 2010, for example, B. Guerrien criticised him for his *"strange fascination with neoclassical theory"* in his book "*The Economy of Inequalities*". He admitted to being surprised by the energy deployed by Piketty to defend the idea of substitutability between labour and capital as well as between the various forms of labour (according to their qualification), an idea closely associated with that of decreasing marginal productivity of factors. It should be remembered that the substitutability between the factors of production is generally put forward to justify, in the name of economic efficiency, a distribution where each is remunerated according to his marginal productivity.

In other words, it seems futile (for workers) to want to modify it. Otherwise, it would come at the expense of economic efficiency, and therefore ultimately collective well-being. Guerrien notes that "*Piketty does not go so far as to say that struggles for better wages are unnecessary, if not harmful. Besides, this must go against his deep convictions*"... even if he retains the main conclusion from neoclassical theory: the efficiency of remuneration at marginal productivity.

The definition of capital is not a trivial matter, no more in Piketty's work than in economic theory. It is at the very basis of a great controversy, between the English school of Cambrige and the American school of Cambridge in the years 1950-1960. Cambridge "UK" (Sraffa, Pasinetti, Robinson in particular) considered one cannot group together under the term capital forms as different as buildings, machines, land, financial assets ... This amounted to contesting the validity of the theories of neoclassical macroeconomic analyses of Cambridge "US", represented in particular by Samuelson and Solow, both Nobel Prize winners. Without going into details, the British considered that with such a definition it became impossible to explain the return on capital. After many years of controversy, Samuelson has come to agree that Cambridge UK is right. In Piketty's book, capital means any form of property, any kind of asset (tangible and intangible) likely to provide its holder with wealth (high income and large wealth) and power.

According to Guerrien, this fascination to the neoclassical theory is simply due to the fact this theory serves his interests. It allows to "*justify his central thesis: only taxation makes it possible to achieve a certain social justice while preserving economic efficiency. It is therefore in the field of taxation, to the exclusion of all others, that the fight to reduce inequalities must be waged*". An absurd thesis, according to him.

R. Boyer (2014) regrets that, after having criticised the hypothesis of marginal productivity, the representative agent model and the intertemporal decision model with an infinite horizon, Piketty finally calls on these same hypotheses and these same models in his reasoning.

Gaël Giraud (2014) also criticises the interest of Thomas Piketty's work in terms of analysing the causes of inequalities. He disputes the model used because of its affiliation with neoclassical theory: it does not take into account neither the currency (which prevents the taking into account of financial deregulation), nor natural resources, nor feedback from the climate on the economy.

### 2nd debate. Piketty's theoretical framework - the 1st fundamental law of capitalism: the profit share "law" ($r_t = \alpha_t / ß_t$)

The writing of his first "law" suggests that the share of profits $\alpha_t$ depends on the evolution of the rate of profit $r_t$ and the capital / income ratio $C_t / R_t$ (noted $ß_t$): $\alpha_t = r_t . ß_t$. It is usually written as: $r_t = \alpha_t / ß_t$, i.e. the classic definition of the rate of profit. Even if this equation is a tautology (which Piketty readily admits), it is poorly posed in Piketty's book. The rate of return on capital is in reality a result of the production process, and not something given elsewhere, a sort of guaranteed rate of profit, which it would suffice to apply to capital. Piketty choses a different causality. So**,** the central question is how to read this equation: what is determinant, causal …? In other words, how to write such an equation?

Husson (2014) and Bihr - Husson (2020) recall that the accounting tautology is the one used by Marxist theory (ß or C / R would correspond to what Marx called the organic composition of capital) and by all the great classical authors of political economy: "*In the formula $r_t = \alpha_t / ß_t$, the profit share $\alpha_t$ is a good indicator of the exploitation rate, and $ß_t$ or $C_t / R_t$ would correspond to what Marx called the organic composition of capital*". The capitalists seek to maximize the rate of profit by exploiting salaried work as much as possible, while avoiding that the accumulated capital weighs too heavily on the profitability of capital. But the rate of return on capital is a result of the production process, and not something given elsewhere, a sort of guaranteed rate of profit, which it would suffice to apply to capital. Even if this equation is a tautology, it is poorly posed in Piketty's book. The relationship is the reverse: "*Piketty thinks the other way around when he makes the return on capital depend on the starting value of capital. Rather, it is by discounting the expected return generated by capital goods in the minds of entrepreneurs who combine them productively that an estimate of the value of capital can be obtained.*" (Vargas Llosa (2017).

The inverted equation is frequently presented as an "*absurd representation, since it would then suffice to accumulate capital to derive additional profit from it*". "*The inversion operated by Piketty is therefore problematic from a theoretical point of view*" (Husson "2014)).

"*While he is making the history of a social relationship which allows a small layer of society to appropriate a growing share of the national income, Piketty in practice renounces the central involvement of the social factors of this permanent struggle for the sharing of wealth*" (Bihr-Husson). Admittedly, Piketty underlines that "*this upward trend [the increase in the share of capital] is consistent not only with an elasticity of substitution greater than one, but also with an improvement in the bargaining power of capital vis-*

*à-vis of work in recent decades*" (p.351). In other words, Piketty could therefore have chosen to combine the technological explanation ("an elasticity of substitution greater than one") and the social explanation ("an improvement in the bargaining power of capital"). But this is not the case. Reversing the accounting equation is a shortcut.

One of Piketty's contributions would be to show that $\alpha_t$ (and $\beta_t$) is not long-term invariant. This is not really a big surprise, even if, for a long time, it seemed to evolve in a fairly stable way in time and space. Likewise, $\beta_t$ is not a long-term constant either. In 1961, Nicholas Kaldor believed he had identified six "stylized facts"[2] (2) which included the long-term constancy of $\alpha$ and $\beta$. He showed that $\alpha_t$ evolves in a fairly stable manner between 0.3 and 0.4 in time and space. Note that Kaldor never claimed that these variables were constant, but he showed that they evolve around an average value. The fact that $\alpha$ fluctuates and is not invariant in the long term poses a problem insofar as they invalidate a postulate which is omnipresent there in a large part of the macroeconomic literature: namely, if the relative shares of capital ($\alpha$) and labour ($1 - \alpha$) in national income is constant, then the description of production by a Cobb-Douglas type function is equivalent to a trivial accounting equation. Since the fact that $\alpha$ is not long-term invariant is crucial in Piketty's analysis, we can really regret that it was not attempted to propose an alternative production function to the one most often used in "classic" macroeconomics.

### 3rd debate. Piketty's theoretical framework - the 2nd fundamental law of capitalism: the capital / income ratio (ß = s / g)

According to the second "law" (initially used by RF Harrod (1900-1978) and E. Domar (1914-1997), two great authors on economic growth models), the capital / income ratio ß depends on the savings rate s and the growth rate of the economy g[3]: "*if a country saves a proportion s of its income indefinitely and if the growth rate of its national income is equal to g permanently, then its capital / income ratio tends to approach more and more ß = s / g, then stabilises at this level*".

The status of "fundamental law" accorded to it by Piketty comes from the empirical observation, supported in Piketty-Zucman (2013), according to which this law is

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[2] *As regards the process of economic change and development in capitalist societies, Kaldor (1961) suggested the following "stylized facts" as a starting point for the construction of theoretical models:*

- *The continued growth in the aggregate volume of production and in the productivity of labour at a steady rate; no recorded tendency of a falling rate of growth of productivity.*
- *A continued increase in the amount of capital per worker ...*
- *A steady rate of profit on capital, at least in the 'developed' capitalist societies ...*
- *Steady capital-to-output ratios over long periods; at least there are no clear long-term trends, either rising or falling, if differences in the degree of utilisation of capital are allowed for ...*
- *A high correlation between the share of profits in income and the share of investment in output; a steady share of profits (and of wages) in societies and/or in periods in which the investment coefficient (the share of investment in output) is constant.*

[3] *In the textbooks, the capital-to-income ratio is not {ß = s / g} but rather {ß = s / (g + ∂)}, where ∂ is the rate at which capital depreciates.*

approximately verified over the very long term in a number of key countries. It is important to underline that this "law" is nowhere verified at a given moment: one of the explanations comes from the fact that we live in a monetary world while the approach of Harrod-Domar-Solow is part of a world where money plays no role.

According to Piketty, this law is therefore only valid in the long term. This relation cannot be used obviously in the short term, since ß would have a negative value in each recession, when g becomes negative. This fundamental law can therefore only be used to compare different periods for a single country, or different countries for the same period.

Harrod and Domar, who sought to lay the groundwork for a growth theory, wrote this relationship the other way around what Piketty does: g = s / ß. The growth rate g depends on the propensity of the economy to invest s and the capital coefficient ß (The capital / income ratio is not inferred from growth, it is the other way around).

Empirically, the validation of this "law" over the long term is not that evident. Piketty - Zucman show that between 1970 and 2010, the relationship (β = s / g) can only explain 60% of the evolution of β. In other words, 40% remain unexplained. The authors believe that this "residual" is explained, precisely, by the recent explosion in the relative prices of capital. Over the period 1870-2010, the equation (β = s / g) accounts for 90% of the evolution of β in France and the United Kingdom. The results are however less convincing for the United States and Germany

Krusell and Smith also criticised this basic law. In particular, they showed that it was based on an extreme and unrealistic assumption about the savings behaviour of agents. They were interested in the hypothesis that "the saving rate does not decrease as much as growth decreases", an assumption which leads to the intermediate conclusion that when growth decreases, the ratio of capital to GDP increases. This result is an essential argument in Piketty's thesis. Their work (and that of Goes) does not allow a conclusion in favour of Piketty's hypotheses: "*we are not sure why Piketty has chosen such an extreme assumption on saving. We have looked in the source materials underlying the book for a test of his assumption, and a comparison with the obvious alternative, and standard, theories, but did not find a clear test or comparison. What is clear, however, is that what lies behind his extreme predictions is his extreme – and, we think, unrealistic – assumption about saving.*"

In his Piketty's book review, Robert Boyer regrets an excessive use of the inductive method. He wonders in particular about the relevance of the equation (β = s / g) and underlines in particular that in the borderline case of an economy in stagnation (g = 0), the equation becomes absurd.

In Piketty's work, the economic force that produces very long-term growth is only the accumulation of capital. Neither raw materials (especially energy), nor human capital, nor institutions ... contribute to growth, except through their influence on what drives capital over the very long term. To use the expression of Giraud (2014), "*what intelligence of capital does Piketty offer us?*" It is that of an autonomous

economic logic (an accumulation which is not compatible with the Harrod - Domar - Solow corpus (HDS), but whose meaning nevertheless depends on this theoretical background), and disturbed in the short and medium term by exogenous shocks from political history (wars and fiscal policies). "*There is still the need to articulate the short and medium term variations in the relative price of capital with its underground dynamics of accumulation. But this is an impossible task to achieve within the theoretical framework (HDS) upon which Piketty depends, which is that of a moneyless economy*".

## 4th debate. Piketty's theoretical framework: the 3rd fundamental law of capitalism - Rate of return on capital (r) > Income growth rate (g)

According to Piketty, the history of inequality is the result of a simple and absolute formula: r > g in which r represents capital income and g economic growth. "*This fundamental inequality [...] will play an essential role in the book. In a way, it sums up the overall logic,*" he writes. It is considered as "*the central contradiction of capitalism*". Piketty considers that capital income has always been greater than economic growth and has allowed the infinite increase in inequalities.

### Is r > g correct?

According to Piketty, the XXIst century would be doomed to weak growth because of the slowdown in demography and innovation. Such a fact is a permissive condition for r > g. However, it is a (Malthusian) postulate. There are still potential engines for intensive development with the growth of the world population, the emergence of new powers, reindustrialisation, the new middle classes in the world, the shift towards an economy of the knowledge ... Having said that, let's concentrate on r > g.

K. Marx's thesis is based on laws of great simplicity[4], including the law of the downward trend in the rate of profit, which governs the dynamics of capitalism and should lead it to its decline. As we have just seen, Piketty's thesis is also based on "simple" laws (at the formulation level), and in particular a surprisingly simple inequality: the real return on capital "r" is greater than the growth rate of the economy "g", therefore r > g. Note that this relationship (r > g) is not very original. One can even say that it is an almost obvious assumption in the economic theory of growth. This is a compensation for investors for risk taking, a compensation for renouncing immediate consumption.

The inequality r > g is therefore a plausible or even "natural" relationship in economic life, at least in "normal" times. According to Piketty, one can quickly see that it

[4] *We can mention three laws in the Marxist theory of capitalism:*

- *The general law of the downward trend in the rate of profit: as capital accumulates, the rate of profit decreases.*
- *The general law of accumulation. In its strong form, real wages are stagnant. In its weak form, there would be a collapse in the share of national income going to the labour (as a production factor).*
- *The general law of the downward trend in competition: as capital accumulates, industrial concentration increases.*

influences - directly and immediately - the distribution of income between those who receive capital income and those who receive wages. On the one hand, the share of capital increases while the salary share decreases. On the other hand, the relationship between wealth and (labour) income tends to increase in our society, as does the relationship between inheritance and (labour) income. The society is thus becoming more and more capitalist, with losers (the beneficiaries of labour income), and winners (the holders of capital). Social determinism (education, relationships, recourse to counsellors, etc.) also accentuates inequalities. In short, the rich get richer even faster than the poor get out of poverty. Society splits in two, and all because of $r > g$. It's simple, it's clear. But is this true?

As Mankiw (2015) illustrates through a standard model that integrates taxation and capital depreciation, even if $r > g$, we can arrive at a steady-state inequality that does not evolve into an endless spiral of inequality.

As demonstrated by MIT Economist Matthew Rognlie, the increase in the percentage of capital in long-term income can be single-handedly attributed to higher prices in the real estate sector (Rognlie (2015)). In other words, take real estate out of the equation and Piketty's findings cannot be replicated.

On the other hand, *"savings are consistently smaller than the sum of all capital income. The wealthy consume substantial parts of their income"* … Thus, the growth rate of wealth lies significantly below the interest rate. In other words, "*the fact that the interest rate exceeds the rate of economic growth in no way implies that wealth grows faster than the economy*" (Sin (2017)).

**Would r be impacted by a decrease in g?**

Acemoglu-robinson points to some limitations of Piketty's approach. In particular, Piketty argues that r should not be greatly impacted by a decrease in g because the elasticity of substitution between capital and labour is high (above 1), resulting in an increase in the share of capital in national income. These two authors recall that the vast majority of existing estimates indicate a short-term elasticity of substitution well below one. This is the case with the work of Hamermesh (1993), Mairesse - Hall - Mulkay (1999), Chirinko - Fazzari - Meyer (1999), Krusell - Ohanian - Rios-Rull - Violante (2000), Chirinko (1993), Antràs (2004), Klump - McAdam - Willman (2007), Oberfield - Raval (2014) … "*The ability to substitute capital for labour is in fact limited in the short run, with rare examples of production*" (without labour, production most often falls to zero). And although this elasticity may be higher in longer time horizons, Chirinko (2008) and Chirinko - Mallick (2014) also find it significantly lower than 1 in the long term.

Karabarbounis - Neiman (2014) are among the rare authors to have estimated an elasticity of substitution greater than one, but as Rognlie (2014) points out, even an elasticity of substitution markedly greater than one would not be sufficient to reach the conclusions Piketty reaches.

**r > g: a non-sense in the long run?**

**Some authors consider the inequality r > g is nonsense in the long run**. It is even a misunderstanding. It is evident that the fortunes of a few cannot increase indefinitely in proportions much greater than those of growth. Very quickly the capitalists would no longer find sufficient goods corresponding to their enrichment. According to J.-P. Delsol (2017), "*if over the past twenty centuries, wealth had grown by 4% per year on average while growth oscillated at rates below 0.5%, it would quickly have become clear that the available wealth was insufficient to satisfy the demand for an increase in assets that savings would have required in investment. Or at the very least the rates of return would have fallen much faster than Piketty imagines. Clearly, the latter's formula is inapplicable in the long term*". In reality, the rate of capital growth is clearly below its rate of return because the rich consume a lot and savings are relatively low, notes Hans-Werner Sinn (2017) who adds that "*the capital / income ratio cannot increase permanently*", contrary to what Piketty would suggest.

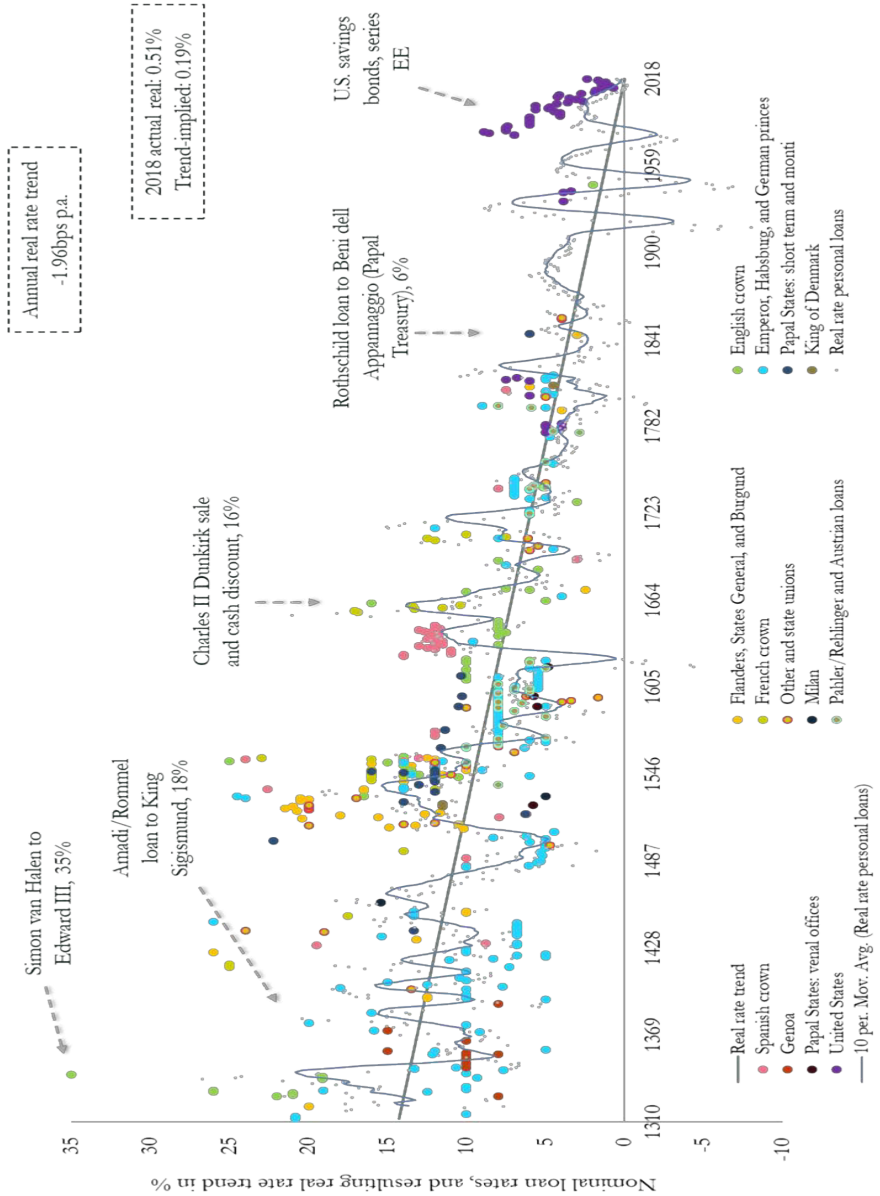
**Is r > g stable?**

Is Piketty right when he suggests a "virtual stability" of returns on capital and thus virtual stability of r-g? To answer this question, we will use the work of P. Schmelzing, who reconstructed global real interest rates on an annual basis dating back to the 14th century, and covering 78% of the GDP of advanced economies over time. It clearly shows that real interest rates have not been "stable" at all, and that since the great monetary upheavals of the end of the Middle Ages, a downward trend between 0.6 and 1.8 basis points per annum prevailed. It also identifies a steady increase in real negative rates of return in advanced economies. If we extricate very long-term trends, we can even fear that real rates will definitely enter negative territory. The r-g series extradited from this large database (and therefore plausible in the long run over the last 800 years) also show a downward trend over the same period. In fact, if historical trends are extrapolated, r-g will soon reach definitively negative territory - a first since at least medieval times[5]. It is difficult to believe in a "virtual stability" of returns on capital, and to argue that Piketty's policy implications are supported by historical data. The general downward trend in returns on capital in all asset classes - demonstrated by Schmelzing - would require a totally disproportionate increase in the capital stock to generate higher absolute returns for owners of capital. This is not the case.

All in all, Schmelzing concludes that there is no reason to expect a "plateau" in rates, to suggest that "the global neutral rate could settle around 1% in the medium and long term", or to proclaim that "the predictions that the real rate will get stuck at values equal to or less than zero seem unwarranted", as some have suggested ((Hamilton – Harris – Hatzius – West (2016); Rachel – Smith (2017)).

[5] *Note that the r-g deviation has been the subject of a specific analysis by O. Blanchard (2019). He postulates that a negative value (i.e. a GDP growth rate higher than real interest rates) would indicate a higher tolerance for public debt.*

## Chart 1: Europe - nominal rate data, 1310-1810, and real rate trend



It is also difficult to predict a return to "normal" levels, assuming you know what a "normal" rate is. Observation of Schmelzing's long-term historical data (Chart 1) suggests that the underlying forces have been indifferent to both monetary and political regimes, regardless of the environment (modern democratic environments, eras feudal...), whether central banks exist or not... and regardless of changes in public debts or public spending. Alongside the development of economies, the price of goods plummets, and so does the price of money.

### 5th debate. The gap (r-g) and rising inequality: not as simple as generally thought

Is there a causal relationship between r > g and the increase in inequalities?

**Piketty highlights the resurgence, as massive as it is recent, of the growing weight of capital (relative to economic activity) and of strong inequalities in the distribution of income.** He analyses the last two centuries to highlight his conclusions. According to his observations, the sequence presented above is verified for the period preceding the First World War, as well as since the 1970s. Between 1918 and 1970, it is not valid, the two World Wars as well as the political situation of the interwar period having radically cut capital income. On the other hand, the post-war boom and exceptional economic growth - called "Wirtschaftswunder" in Germany, and the "Trentes Glorieuses" in France - had "crushed" the r > g relationship. The relatively egalitarian world of the "Thirty Glorious Years" (1945 -1975) might be replaced by once again very unequal societies, with a force of inertia notably in terms of wealth inequalities.

So, according to Piketty, the evolution of capitalism since industrialisation can be divided into three phases: two "normal" phases of widening inequalities and the predominance of capital (before 1914 and from the end of the 1970s until today), and an "abnormal" phase, notably the period of very strong economic growth (1945-1975). In sum, the "normal" phases correspond to the logic of capital accumulation that has been effective for a long time, but the effects of which were delayed, in the 20th century, by the succession of wars, tax policies not very favourable to rentiers and strong growth in the post-war period. As these three favourable factors more or less disappeared in the 1990s, it is to be feared that inequalities will widen very sharply. A return to "normal" simply means a worsening of inequalities, and why not a return to the post-1914 inequalities ... if the public authorities are not careful.

Piketty sees this probable development as a great threat to democracy, via the return of "patrimonial capitalism", a capitalism that does not pay for skills, merit, risk taking, performance, but the fortune inherited or amassed throughout life. It is therefore necessary to intervene to re-establish meritocracy, through taxation, in the form of confiscatory taxes for high incomes and important inheritances, as well as a considerable annual tax on capital. Socialist and neo-Marxist supporters share Piketty's analyses, conclusions and recommendations, but many lament that he does not want to do away with performance-based capitalism, but offers to rebuild it. The best way to counter the accumulation and rising inequality would be to implement a progressive global capital tax, not to make a clean sweep of capitalism.

Economists have also used Piketty's data to further analyse the relationship between return on capital and economic growth, and inequality. Some of them have adopted an approach by sector and by level of openness to competition. In a study published in June 2014, **Xavier Timbeau and Guillaume Allègre, economists at OFCE, explain the same phenomenon as Piketty ... but with reverse causality**. Piketty set out to demonstrate that the return on capital (r) is higher than economic growth (g), which has the almost inevitable consequence that inherited patrimonies dominate the established patrimonies and that the concentration of capital reaches extremely high levels. According to the authors, **Piketty seeks macroeconomic foundations (r > g) for inequalities while the usual explanations are microeconomic**. Moreover, Allègre and Timbeau show that one can interpret the facts described according to a different causality, the inequalities resulting from the (imperfect) functioning of markets, scarcity rents and the establishment of property rights. According to this interpretation, it would not be the inequality r> g that would have transformed entrepreneurs into rentiers, but rather the establishment of mechanisms allowing the extraction of a perpetual rent which would explain the historical constancy r> g. "*If, for Thomas Piketty, returns on capital rise faster than growth, then entrepreneurs turn into rentiers and the past devours the future. I think the causality is the opposite: it is because entrepreneurs manage to transform themselves into rentiers that they can derive an excessive return on their capital*" (Allègre, FigaroVox, May 13, 2014). The difference is significant, in terms of results and analysis, but also and especially in terms of public policy recommendations. **The ex-post taxation of capital** (already proposed by M. Kalecki in 1943)**, even when it is deemed necessary, would then perhaps only be a second choice**: *"we must first remove the constraints of scarcity and be concerned with the definition of property rights as well as of the rights of owners and non-owners*".

Milanovic (2017) explains that the transmission mechanism between r > g and higher income inequalities requires that three conditions be met: i) savings rates must be sufficiently high; ii) income from capital should be distributed more unevenly than income from labour; and iii) a strong correlation between earning income from capital and being at the top of the income distribution. He actually shows that this transmission mechanism is blocked because the negative responses of the savings rate to (r - g) shocks violate the first condition, thus avoiding inequalities of higher levels compared to those observed before increases in r - g.

In an econometric study published in 2015 in the Journal of Economic Perspectives, Daron Acemoglu (Massachusetts Institute of Technology) and James A. Robinson (University of Chicago) also criticise Piketty's methods: based on their interpretation of his book and the multitude of data provided, they clearly see an increase in inequality but remain sceptical because Piketty does not conduct basic regression analysis to validate his proofs (is the rise of inequality a cause or effect?). **Using econometric testing on several countries,** Acemoglu - Robinson (2015) **found an insignificant negative correlation between the gap between return on capital and the growth**

**rate (r-g) and the rise of inequality.** "*It is unclear whether r > g is a force towards income divergence through the distribution of income, or towards convergence towards a new, more unequal distribution of income.*"

According to them, "*Piketty goes wrong for exactly the same reasons that Karl Marx, and before him David Ricardo, went astray. These quests for general laws ignore both institutions and politics, and the flexible and multifaceted nature of technology, which make the responses to the same stimuli conditional on historical, political, institutional, and contingent aspects of the society and the epoch, vitiating the foundations of theories seeking fundamental, general laws*". Any plausible theory of the nature and evolution of inequality must include political and economic and monetary institutions. "*The quest for general laws of capitalism is misguided because it ignores the key forces shaping how an economy functions: the endogenous evolution of technology and of the institutions and the political equilibrium that influence not only technology but also how markets function and how the gains from various different economic arrangements are distributed. Despite his erudition, ambition, and creativity, Marx was led astray because of his disregard of these forces. The same is true of Piketty's sweeping account of inequality in capitalist economies*".

In other words, this means that the income inequality observed in many advanced economies over the past decades can be explained by factors other than the gap between r and g. As noted, "*Piketty's Third Law (r > g) has been known to economic theorists for at least 50 years, and no economic theorist has ever suggested that it "explains" rising inequality. Because it doesn't. It can't, because the models that generate this finding are fully compatible with stable inequalities of income and wealth. You need something else to get at rising inequality*". Francese and Mulas-Granados (2015) argue that recent trends in inequality are not linked to the distribution of national income between factors of production but mainly to growing inequality in labour income. Among the explanatory factors of inequalities (note that none refers neither to the capital-income ratio, nor to the relationship (r > g) of the main causes of inequality models, Acemoglu - Robinson mention:

- Higher qualification bonuses in recent decades (Dabla-Norris – Kochhar – Suphaphiphat – Ricka – Tsounta (2015));
- Lower unionisation rates (Dabla-Norris – Kochhar – Suphaphiphat – Ricka – Tsounta (2015)), Jaumotte and Buitron (2015));
- The role of innovation and the associated remuneration which, according to Aghion – Akcigit – Bergeaud – Blundell - Hemous (2015), explains about a fifth of the higher inequalities observed in the United States since 1975;
- Women's qualifications "*have greatly improved and endogamy, by level of qualification, more and more, governs the formation of couples*" (Maillard (2016). The rich (in human capital) marry the rich (in human capital). Human capital is expected to be transformed into physical or financial capital. A typical situation since the beginning of the second part of the twentieth century, and a factor of inequality.

- "Assortative mating" (ie the probability that someone will marry another person with a similar socio-educational background), which has increased in tandem with the rise in income inequality everywhere in US in the recent decades (Mare (2016) and Greenwood – Guner – Kocharkov - Santos (2012));
- The quality of institutions: if the basic rules of economic behaviour are not symmetrically enforced, the rich will have a higher chance to extract economic rents, thereby increasing inequality (Chong - Gradstein (2007));
- The distribution of skills in society, indirectly determining inequality patterns is also linked to economic institutions (Acemoglu - Robinson (2015))
- ...

### 6th debate. Piketty's data have been challenged

Since the publication of the book "Capital in the 21st century", Thomas Piketty's experimental methods have been regularly contested, even accused of data manipulation. Richard Sutch (California University) and Chris Giles (Financial Times) deproved that there were **many errors in Piketty's database**, especially involving data on the richest 1%.

In 2014, a Financial Times survey pointed to errors by indicating that "*certain data are selected or constructed without an original source*". Chris Giles notes that the share of wealth held by the richest 10% is 44% according to the Office for National Statistics and 71% according to Thomas Piketty. According to Chris Giles, the errors and approximations he found call into question two major results of the book: the increase in wealth inequalities over the past 30 years and the fact that wealth inequalities are greater in the United States than in Europe. In other words, **the findings do little to support the thesis that an increasing share of total wealth is held by the richest**. A few days later, in response to the Financial Times survey, Piketty said he used "*a very diverse and heterogeneous set of data sources … [on which] it is necessary to make a number of adjustments to the raw data sources*". Piketty points out that if the existing data on wealth are imperfect, the data on declarations of inheritance are more reliable and point in the same direction. According to him, the remarks of the Financial Times do not change the conclusions of the book. As for Chris Giles' proposal on the evolution of wealth inequalities in the United Kingdom, he considers the methodological choices of the Financial Times journalist as highly questionable. Indeed, it relied on survey data rather than tax data. However, survey data underestimate high wealth. The Washington Post's Matt O'Brien and economist Howard Reed defend the data presented by Thomas Piketty. Reed (The Guardian, 2014) also highlights important mistakes made by the Financial Times journalist. Finally, on his blog, Paul Krugman defends Piketty.

However, in a paper published in October 2017 in the journal Social Science History (Cambridge University Press), Richard Sutch accuses Thomas Piketty of having artificially modified the data in order to "*dramatise*" the results: "*The heavily manipulated data, the lack of clarity about the procedures used to harmonize and average the data, the insufficient documentation, and the spreadsheet errors are*

*more than annoying. Very little of value can be salvaged from Piketty's treatment of data from the nineteenth century.*" More severely, Robert P. Murphy, go so far as to speak of "*inventions of historical facts in order to support his narration*".

For his part, IMF Economist Carlos Goes conducted detailed statistical and econometric analyses, proving that **Piketty's findings offered little more than "*some apparent correlations*."** He has tested Piketty's hypotheses on the drivers of income inequalities. A test carried out over a period of 30 years in 19 advanced economies concludes "*there is no empirical evidence to show that the relationship between capital and growth evolves as suggested by Thomas Piketty." "Results are robust to several alternative estimates of r-g*". In 75% of cases, the widening inequalities do not hold true according to the hypotheses put forward by Thomas Piketty.

Methodologically, some of the authors assert that there are **very questionable choices of data and regrettable omissions**. Martin Feldstein (2017), professor at Harvard University underlined that to "*justify an increase in inequalities in the United States, Thomas Piketty uses tax returns without taking into account the significant changes which took place in the tax rules (...) that it does not take into account the redistribution transfers*". Inequalities have been greatly reduced in terms of access to education or care, and correspondingly in terms of longevity. **Piketty's analysis can therefore be criticised for focusing on the enrichment of the "1%" and for forgetting the enrichment of the "99%" a little too quickly.**

In the same vein, B. Zimmern recalculated the median American income between 1979 and 2007: according to his calculation, the median income has not increased by 3%, as Piketty claims, but by almost 10% when taking social transfers into account, or even by 18.2% when also taking into account includes the benefits of health insurance paid by the employer or by the state. Similarly, for the valuation of heritage, Piketty does not take pensions into account.

In 2014, Piketty took these shortcomings into consideration, admitting: "*I have no doubt that my historical data sets can and will be improved in the future ... but I would be very surprised if any of these basic conclusions about the long-term evolution of the distribution of wealth would be greatly affected by these improvements*".

### 7th debate. Capital: a fetishistic concept, ignoring human capital

D. McCloskey wrote in Autumn 2014 a very interesting analysis of T. Piketty's book. Amongst different criticisms addressed to "Capital in the 21st century", McCloskey recalls that Piketty's definition of wealth "*does not include human capital, owned by the workers, which has grown in rich countries to be the main source of income, when it is combined with the immense accumulation since 1800 of capital in knowledge and social habits, owned by everyone with access to them*". (...) According to the author, Piketty's world without human capital was "*approximately our world, that of Ricardo and Marx, with workers owning only their hands and backs, and the*

*bosses and landlords owning all the other means of production". But since 1848, the world has been transformed by what is between the workers' ears*".

**The result of excluding human capital from capital is to artificially force the conclusion Piketty wants to achieve**, that inequality has increased, or will, or might, or is to be feared. She also noted that "*the neglect of human capital on the Problems side of the book is doubly strange because on the Solutions side Piketty recommends education and other investments in human capital*".

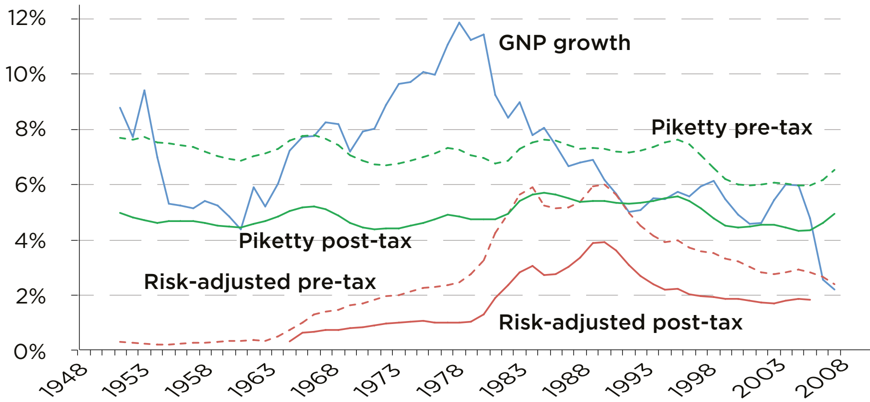
Giraud (2014), in particular, deplores that the concept of capital adopted by Piketty includes both heritage and productivist infrastructures, which makes his analysis of the causes of inequalities illegible. Bihr and Husson (2020), among others, also criticise Piketty's definition of capital used in "Capital and Ideology". Capital means any form of property, any kind of asset (tangible and intangible) likely to provide its holder with wealth (high income and large wealth) and power. "*He adopts a fetishistic conception of capital: on the one hand, he reifies it (he confuses it with its material support (means of production, money, credit or property titles) and, on the other hand, he deifies it (like a superhuman or even supernatural power)*".

### 8th debate. Risk-taking and income instability are not addressed in Piketty's research

Alan Auerbach (University of California-Berkeley) and Kevin Hassett (American Enterprise Institute) demonstrated that **Piketty did not include risk and income instability when calculating return on capital**. In their article (using the NBER TAXSIM model), they put together an alternative chronological series on rates of return after tax in the US including the risk-taking and income instability.

Chart 2 presents this alternative series and the series on capital returns (before and after tax) extracted from Piketty and Zucman's research (2014). It is clear that the rate of return before tax, using the alternative specification, is much lower than the rate of return in series based on national accounts in Piketty and Zucman's research (2014). Similarly, the rate of return after tax using the highest marginal tax rate is significantly lower than the after-tax rate. In addition, the alternative rate of return after tax is systematically lower than the GDP growth rate. "*From this perspective, the apocalyptic r > g 'exploding wealth inequality' scenario does not look especially likely.*"

**Chart 2: r-g: Four separate approaches**




*Source: Authors' calculations, Global Financial Data (2014), Federal Reserve Economic Data, Piketty and Zucman (2014)*

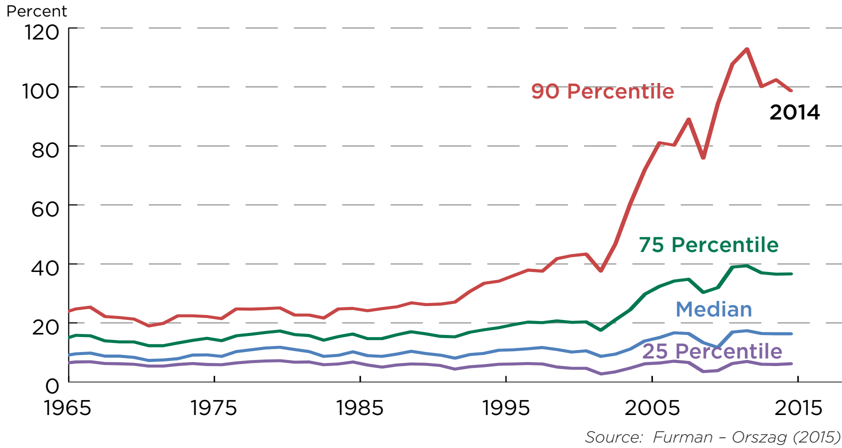
According to Holcombe, Piketty writes as if the return to capital were automatic: all a capitalist would need to do is invest his money and rewards will flow to him at a fixed rate. Precisely the opposite is the case: "*The general idea—that capital does not just earn a rate of return, but has to be employed in productive activity by its owner—plays no role in the way Piketty analyses his extensive data set on inequality. Piketty makes it appear that earning a return on capital is a passive activity.... But capital has value only because it provides a flow of income to its owners, and it only provides that flow if the owners employ it productively (Holcombe 2017)*. There lies a problem with Piketty's entire approach to capital theory.

## 9th debate. Rents and inequality: a strong correlation

Peter Orszag and Jason Furman (Chair of the Council of Economic Advisors, and former head of the Congressional Budget Office) also proved that **rents have a greater impact on the rise of inequality than the return on capital**, contradicting Piketty's assertion.

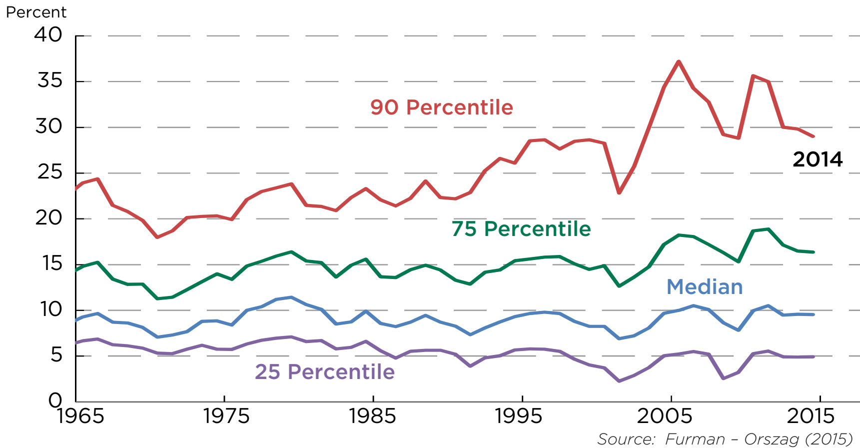
Another major point: newer evidence suggests that much of the rise in earnings inequality represents the increased dispersion of earnings *between* firms rather than *within* firms (Barth et al. 2014 and Song et al. (2019)). For Furman – Orszag, "*This is consistent with the combination of a rising dispersion of returns at the firm level and the inter-industry pay differential model, as well as with the notion that firms are wage setters rather than wage takers in a less-than-perfectly-competitive marketplace.*" In other words, a more "global" argument is either biased or overlooks this reality.

## Chart 3: ROIC excluding goodwill – Listed US non-financial companies (as a %)




Source: Furman – Orszag (2015)

## Chart 4: ROIC including goodwill – Listed US non-financial companies (as a %)




Source: Furman – Orszag (2015)

The underlying question is whether or not another perspective on inequality trends – consistent with the data presented, but not the only consistent explanation – is that

- A rising share of firms are earning super-normal returns on capital;
- Workers at those firms are both producing and sharing in those super-normal returns, driving up wage inequality;
- The high returns to labour and capital at those firms reduces labour mobility by discouraging workers from leaving firms that earn higher rents.

This is what Furman and Orszag suspect and attempt to prove.

### 10th debate. Questionable long term prospects

Piketty's work is not just about analysing past or present inequalities. It also has the ambition to present long-term trends. Even if it is shown that the relationship r / g is not stable, or even incompatible with the conclusions of Piketty for relatively long periods, the author uses r > g for long-term prospects, until 2050 and even until the XXIInd century. Is it really legitimate? Probably not, because to do this Piketty postulates growth rates and rates of return on capital safeguarding r > g, and at levels similar to those which prevailed before the First World War (gradually declining to these levels). Hypotheses with an obviously debatable basis.

The question of long cycles, labour productivity, for example, or even of the risks of secular stagnation are absent from his analysis … while these themes are currently the subject of a large and solid literature. As early as 2013, R. Boyer mentioned that Piketty's foresight efforts "*clearly show the fragility of the theoretical bases of the work*". This "*only contains accounting equations, and not structural relationships between key variables*". This is all the more annoying as the "simulations" performed are not just illustrations: Piketty's reform proposals rest on these fragile theoretical foundations. Boyer (2013) and Husson (2014) consider that "*the poverty of the theory is regrettable in view of the richness of the data*".

### 11th debate. Inequality in the distribution of primary income vs. post-transfer inequality: a much different reality, and very different findings

**It is also important to stress that Piketty uses income before redistribution in his proofs. However, the very purpose of tax schemes and employee benefits is to reduce basic inequality (or inequality in the distribution of primary income).**

It doesn't make much sense to only look at primary income, because there is significant redistribution in the US economy (like other economies), as opposed to what some observers might think: the richest 1% earned 19% of total income but paid 38% of all income tax in 2013 as estimated by The Tax Foundation. If we include all other types of taxes, the richest 1% paid 25% of taxes but earned 15% of pre-tax income in 2015, as reported by the Congressional Budget Office.

The US has more than 100 aid programmes aimed at reducing poverty. In 2012, families in lowest 25% of income received an average of $27,000 in transfers while families in the highest 25% paid $87,000 more than they received from the government.

**Actually, given that tax schemes and employee benefits are constantly evolving,** it is undoubtedly better to measure the change in inequality using consumption expenditure rather than income. However, a survey conducted by the American Enterprise Institute showed that, between 2000 and 2010, **the consumption levels of different population quartiles were stable in the US: the share of overall consumption fell from 8.9% to 8.7% for the poorest 25%, and from 17.3% to 17.1% for the second 25%, but climbed from 37.3% to 38.6% for the richest 25%…**

**This evolution is diverging significantly from Piketty's statistics** (which showed a sharp rise in inequality over the same period).

## 12th debate. Progressive taxation has reduced inequality

Piketty's findings are also disputed in another study by Gerald Auten and David Splinter, economists with the Joint Committee on Taxation (US Congress) and the Office of Tax Analysis (US Treasury Department). They use the same IRS tax data as Piketty, finding that the top 1 percent's share of national income, after taxes are taken into account, rose from 8.4% in 1979 to 10.1% in 2015, a 20% increase, but more than doubled according to Piketty's calculations. Why such a large difference? According to the authors, it can be attributed to income redistribution. The top federal tax rate for individuals may have fallen from 91% to 39.6% between 1960 and 2015, but the many reforms aimed at expanding the base and decreasing the use of tax shelters raised the effective tax rate for the top 1% from 14% to 24%

**If all taxes are taken into consideration, the effective tax rate of the richest 10% has climbed, but has fallen for the remaining 90%.** Thanks to the rise of progressive tax, the richest members of the population have seen their income grow much less than suggested by Piketty. According to the authors, inequality barely budged between 1960 and 2015: **the share of the richest 0.1% and the richest 10% held steady at around 3.5% and 30%.**

## 13th debate. Do the rich really inherit their wealth? No: many are entrepreneurs and self-made men

Another big question is whether observed data confirm Piketty's findings — a world of relatively do-nothing heirs content to reinvest their wealth — or the opposite, i.e. a world of entrepreneurs who build their fortunes through strategy and risk-taking?

In "A Century of Wealth in America" (2017), economist Edward Wolff (Yale, Harvard) disputes Piketty's thesis that the rich have inherited their wealth. Statistics don't lie: between 1989 and 2013, 77% of wealthy people earned it with their own activities and 23% can be considered as earned from inheritance. **83% of the richest 1% are self-made men and just 17% inherited their wealth! This completely contradicts Piketty's assertion**. Wealth is not set in stone and thus does not tend to grow indefinitely.

Forbes, which ranks the 400 richest people in the world (based on assets, companies, real estate, artwork, yachts, etc.), has also developed a "self-made score" from 1 to 10 with 1 designating silver-spooners and 10 boostrappers that overcame obstacles to pull themselves out of poverty.

- Of the resulting 10 groups, groups 1 to 5 comprise people who inherited some or all of their fortune, including those who earn all of their income from dividends (the first two groups).
- However, the last three groups include wealthy people from the upper middle class, the working class and the underprivileged class (see inset below).

We would also point out that of the 400 wealthiest Americans, 254 founded their own company and nearly half did so by the age of 30 (85% by the age of 40).

Economist G. Nicoulaud (2016) took a closer look at the 200 richest Americans, i.e. those boasting net assets of no less than $3.3 billion. Of the resulting 10 groups, groups 1 to 5 comprise people who inherited some or all of their fortune (66 out of 200), including those who earn all of their income from dividends (two groups of 24 people, i.e. 12% of the total). However, **the rich who hail from the upper middle class (67), the working class (29) and the underprivileged class (19) total 115 out of 200, i.e. 57% of the panel (compared with "pure" rentiers, totalling 24 out of 200 or 12% of the total). These are the people overlooked by Piketty,** which is unfortunate: the wealthiest Americans are not rentiers. Quite the contrary. To be more complete, note that William Nordhaus (2004) has calculated that inventors and entrepreneurs nowadays earn in profit only 2 percent of the social value of their inventions. Rich people such as entrepreneurs, inventors are not the problem, they are the solution in terms of value, jobs cretion, investment in capacity to redistribute ...

**Box 1 - 10 groups in the Forbes self-made score**
(sources: Forbes, G. Nicoulaud)

- **Group 1: Inherited fortune but not working to increase it (13 people).**
  Most of the members of this group are women (12 out of 13) who inherited their wealth or are widows of entrepreneurs (Walmart, Cargill, Loews, Disney, Apple, etc.).
- **Group 2: Inherited fortune and has a role managing it (11 people).**
  This is also a predominantly female group, made up of heiresses, daughters or granddaughters of company founders not content to sit back and collect dividends and do not act like rentiers.
- **Group 3. Inherited fortune and helping to increase it marginally (10 people).**
  This group is mostly made up of men running and expanding the business founded by their father or grandfather (Cook Group, Fidelity Investments, Hyatt Hotel, etc.).
- **Group 4. Inherited fortune and increasing it in a meaningful way (10 people).**
  This group includes entrepreneurs who have made the family business prosper (e.g. Walmart) or who decided to start their own company in a different sector (e.g. one of the Kellogg heirs).
- **Group 5. Inherited small or medium-size business and made it into a ten-digit fortune (22 people).**
  This is the final category of heirs in the Forbes ranking, but who are definitely not rentiers (Trump, Koch, U-Haul, etc.).
- **Group 6. Hired or hands-off investor who didn't create the business (5 people).**
  This is a small category including employees who have been with the company from the beginning, such as Steve Ballmer (Microsoft), Eric Schmidt (Google) and Jeff Skoll (eBay).

- **Group 7. Self-made who got a head start from wealthy parents and moneyed background (14 people).**
- **Group 8. Self-made who came from a middle- or upper-middle-class background (67 people).**

  This group includes names such as Bill Gates (father: lawyer, mother: businesswoman), Mark Zuckerberg (father: dentist, mother: psychiatrist) and Michael Bloomberg (father: accountant), alongside Warren Buffet, Jeff Bezos, Larry Page, Phil Knight, Michael Dell, Paul Allen, Elon Musk, George Lucas and Steven Spielberg.
- **Group 9. Self-made who came from a largely working-class background; rose from little or nothing (29 people).**

  Larry Ellison (Oracle) is the son of a pilot that he never knew and a mother who abandoned him at the age of 9 months; Sergey Brin (Google), is the son of a Soviet maths professor who escaped the USSR; John Paulson, born in Queens and orphaned at 15; Ralph Lauren, a kid from the Bronx ... Bruce Kovner (hedge fund) ...
- **Group 10. Self-made who not only grew up poor but also overcame significant obstacles (19 people).**

  This group includes Sheldon Adelson (real estate, casinos), who grew up under the poverty line in Boston (selling newspapers on the street as a teen), George Soros (who barely escaped the nazis in Budapest), Carl Icahn (son of a substitute teacher in Queens), Kieu Hoang (who grew up in the rice fields of Vietnam), Neil Bluhm (real estate, casinos), abandoned by his father at the age of 13 ...

| Self-made score | Number (total = 200) | Fortune (median – US bln) | Age (average) |
|---|---|---|---|
| 1 | 13 | 5,0 | 63 |
| 2 | 11 | 5.0 | 71 |
| 3 | 10 | 3.7 | 55 |
| 4 | 10 | 5.0 | 64 |
| 5 | 22 | 5.9 | 76 |
| 6 | 5 | 7.6 | 65 |
| 7 | 14 | 4.25 | 71 |
| 8 | 67 | 5.0 | 62 |
| 9 | 29 | 4.8 | 72 |
| 10 | 19 | 5.4 | 72 |

For comparison's sake, according to the Forbes France ranking, the number of French billionaire entrepreneurs is 23 (57.5%), versus 17 heirs.

## 14th debate. The nature and the significant variation in the composition of the top 1% or 5% must be taken into account

**The significant variation in the panel of super-rich (Forbes 400) disqualify Piketty's findings.** Many people have a static view of wealth, making the mistake of believing that when a person becomes wealthy, he will always be rich, and each succeeding generation

will become even richer - forever. According to J.R. Rallo (2017), "*Thomas Piketty tries to demonstrate in his deliciously misguided book, Capital in the 21st Century, that there is a tendency within capitalism to set capital return above the growth rate of the economy; the capitalist class, thereby, accumulates an ever-increasing portion of national income, thus aggravating social inequality". Worse yet, "Piketty seems to think that the richest individuals within the capitalist class have greater opportunities to get a higher rate of return than capitalists of more modest means. Thus, the natural tendency of capitalism permits the super-rich (and their heirs) to seize increasing portions of the total wealth*".

While it may be interesting to provide statistics on the top 1% or 5%, **the fact that the composition of these segments is not stable *over time* (new fortunes are created, others are destroyed) also significantly disqualifies Piketty's findings**. Although the wealth of the richest stratum of society rose at an average annual rate of return of 6.8 percent between 1987 and 2010, that does not mean that the rich people of 1987 are the same as those in 2010. Rallo (2017) give some examples. According to his analysis of Forbes400 data, the richest person in the world in 1987 was Japanese (Yoshiaki Tsutsumi), with a fortune estimated at $20 billion. Since 2006, he is not in the Forbes400 list anymore (list of the richest persons in the world). His wealth dropped by 96% since 1987. According to Piketty, it should have multiplied by 6 (Rallo, 2017). The second richest man in the world in 1987 was Taikichiro Mori ($15 billion). In 2016, the combined inheritance of his sons has dropped 80%. The numbers 3 and 4 in the list were also Japanese (S. Kobayashi and H. Yoshimoto), and they had mostly invested in the Japanese housing sector, which has tumbled in the deflationary period. The number 5 was from Saudi Arabia (Salim Mahfouz): in 2009, his fortune was drastically reduced (-72%). The number 6, two American brothers (Hans and Gad Rausing), earned an annual real rate of return of 2,7% over the period (1987 – 2106), far from the 6,8% suggested by Piketty. In 7th place were the Reichman brothers: $6 billion in 1987 and $100 millions in 1993 due to a bankruptcy. In 8th place, another Japanese, Y. Iwasaki, who lost 50% in 5 years. To sum up, lots of richest persons in 1987 lost part of their wealth, or were not able to capture a real rate of return of 6,8% per year. "*Contrary to what many people imagine and what Thomas Piketty claims to show, it is not easy to conserve assets in a market economy. Assets are at the mercy of changing consumer preferences, the emergence of new competitors, and the possible overvaluation (and ultimate collapse) of asset prices. It is simply wrong to say that there is a threshold at which capital accumulation takes place at an almost automatic pace*" (Rallo, 2017).

In 2015, Rank and Hirschl (Washington University in Saint Louse and Cornell) published a study on mobility among the wealthiest 10%. This research contradicts Piketty's thesis, whereby the rich inherited their wealth, and continue accumulating wealth their whole lives. According to Rank and Hirschl:

- 53% of Americans have been counted during their lifetimes, for at least one year on average, among the wealthiest 10% (in terms of assets);
- 11% of Americans have been counted among the wealthiest 1% for at least one year;
- and by the age of 60, 70% of wage earners will spend at least one year in the top 20% of the income bracket.

- In addition to this fluidity, Rank and Hirschl state that very few people remain in the super-rich class for long (new large fortunes are created quickly, and new contenders emerge each year) … to the detriment of other super-rich (who lose some of their fortune… or worse). In 2019, some of the super-rich lost $2bn, i.e. half of their fortune: each of the Fertitta brothers (Casinos) has lost $2bn, i.e. -50%; Phillip Frost (pharmaceuticals) lost nearly $1bn (-30%); Nick Caporella (beverages) lost 65% as did David Zalik (Fin Tech) …

All in all, focusing on the ultra-rich leads to two biases, on the one hand because they represent a separate category (the progressivity of the tax works for the majority of the population), and on the other hand because that the content of this category is much volatile than you might think. Statistics published for example by the University of Michigan, the PSID (Panel Study of Income dynamic), which tracks 25,000 American households, show very clearly that it is difficult to stay on top. The annual Forbes survey of America's 400 richest (billionaires) shows that a large portion of those who make the list a year, drop out quickly. We can even distinguish the rich who are entrepreneurs and the rich who are simply employees. We can clearly see that being an entrepreneur can go up from the lowest income quintile to the highest but also fall from the highest decile to the lowest from one survey to the next. On the other hand, it is impossible to climb so fast or descend so quickly when you are an employee. In other words, wealth measured by income or assets is intimately associated with entrepreneurial risk-taking and not with the relative security of an employee. This is even more obvious in countries with few civil servants and few jobs that are virtually guaranteed for life.

It is therefore no coincidence that there is a large proportion of entrepreneurs in the wealthiest categories. The Federal Reserve's Survey of Consumer Finances conducted every three years since 1983 on the income and wealth of Americans shows the weight of entrepreneurs in the rise of the wealth of the richest. A 2006 study by Cagetti and de Nardi using data from the Fed showed four key features:

- In income distribution, the highest 1% of income was made up of two-thirds entrepreneurs;
- The percentage of entrepreneurs declines as you move down the income ladder.
- We find the figure of two-thirds of entrepreneurs for the richest 0.002% who represent the category of billionaires.
- So, it seems very difficult to be in the richest 1% without being an entrepreneur.

### 15th debate. Reduced inequality does not lead to reduced poverty

It is very important to check the status and change in inequality, but also to ask whether or not it is possible/easy to pull yourself out of extreme poverty.

- First and foremost, this is a question of absolute inequality: the fight against poverty, exclusion, insecurity;
- Next, it is a question of relative inequality: the poorest learning to better manage any smaller increase in income and assets, encouraging the sharing of added value (employees vs. shareholders), managing executive pay …

Reduced inequality does not lead to reduced poverty. However, the opposite is true. The fight against poverty is mostly separate from the fight against inequality. Moreover, inequality is a relative concept and poverty (minimum subsistence) is an absolute concept.

## 16th debate. How the super-rich behave: dividends, risk-taking … And foundations, philanthropy…

According to Piketty, rich people are individualist, useless, except to accumulate money … most often passively. Moreover, inheritance makes it possible to consolidate single inequalities, and to amplify them. As a consequence, one can get over the rich, tax them at 90% would not have any disadvantages, and removing the right to inheritance would be necessary. The behaviour of the super-rich, castigated by "egalitarians" or organisations like Oxfam (for example) needs to be clarified:

- Some of the super-rich support virtually excessive taxes, as seen in Roosevelt's New Deal. In that sense, they agree with the recommendations of certain politicians and economists (e.g. Piketty). This is not entirely new. A little over a year ago, a small group of American billionaires including businessman George Soros, Facebook co-founder Chris Hughes and heirs of the Hyatt and Disney empires among others, published a letter to support the idea of a wealth tax. More recently, last July, a group of 83 billionaires called for more taxing the richest on the planet, "immediately" and "permanently" to help recovery from the crisis generated by the COVID19 pandemic.
- Many have foundations allowing them to develop philanthropic programmes. Forbes has also created a philanthropy score (see table below), which shows that most of the rich are involved in philanthropy: a score of 5 (respectively 1) indicates significant (respectively insignificant) philanthropic activity;
- It is misguided to suggest that the rich spend all their time just waiting to collect dividends. For example, Jeff Bezos (Amazon) recently announced the creation of a $10bn fund aimed at preventing global warming.
- Lastly, some of the super-rich have signed a "giving pledge" in 2011, which is a commitment to leave at least half of their fortunes to charity. Giving pledges have been signed by Bill and Melinda Gates, Warren Buffet, Mark Zuckerberg, Larry Ellison, Michael Bloomberg, McKenzie Bezos, Carl Icahn, etc.

**Table 1: A few details on the 40 richest Americans**

| Ranking | Last name | First name | Source | Wealth ($ bn) | Age | Philanthropy score |
|---|---|---|---|---|---|---|
| 1 | BEZOS | Jeff | Amazon | 114.0 | 55 | 2 |
| 2 | GATES | Bill | Microsoft | 106.0 | 64 | 5 |
| 3 | BUFFET | Warren | Berkshire Hathaway | 80.8 | 89 | 5 |
| 4 | ZUCKERBERG | Mark | Facebook | 69.6 | 35 | 5 |
| 5 | ELLISON | Larry | Oracle | 65.0 | 75 | 4 |
| 6 | PAGE | Larry | Google | 55.5 | 46 | 4 |

| Ranking | Last name | First name | Source | Wealth ($ bn) | Age | Philanthropy score |
|---|---|---|---|---|---|---|
| **7** | BRIN | Sergey | Google | 53.5 | 46 | 4 |
| **8** | BLOOMBERG | Michael | Bloomberg | 53.4 | 77 | 5 |
| **9** | BALLMER | Steve | Microsoft | 51.7 | 63 | 4 |
| **10** | WALTON | Jim | Walmart | 51.6 | 71 | 4 |
| **11** | WALTON | Alice | Walmart | 51.4 | 70 | 3 |
| **12** | WALTON | Rob | Walmart | 51.3 | 75 | 1 |
| **13** | KOCH | Charles | Koch Industries | 41.0 | 83 | 4 |
| **14** | KOCH | Julia | Koch Industries | 41.8 | 57 | - |
| **15** | BEZOS | McKenzie | Amazon | 36.1 | 49 | - |
| **16** | KNIGHT | Phil | Nike | 35.9 | 81 | 4 |
| **17** | ADELSON | Sheldon | Casinos | 34.5 | 86 | 4 |
| **18** | DELL | Michael | Dell Computers | 32.3 | 54 | 4 |
| **19** | MARCH | Jaqueline | Candy, pet food | 29.7 | 80 | 1 |
| **20** | MARCH | John | Candy, pet food | 29.7 | 84 | 2 |
| **21** | SIMONS | Jim | Hedge funds | 21.8 | 81 | 5 |
| **22** | POWELL JOBS | Laurene | Apple, Disney | 21.3 | 55 | 5 |
| **23** | MUSK | Elon | Tesla, SpaceX | 19.9 | 48 | 3 |
| **24** | MURDOCH | Rupert | Newspapers, media | 19.1 | 88 | 1 |
| **25** | LAUDER | Leonard | Estee Lauder | 18.8 | 82 | 4 |
| **26** | DALIO | Ray | Hedge funds | 18.7 | 70 | 4 |
| **27** | BLAVATNIK | Len | Other | 18.3 | 62 | 3 |
| **28** | WALTON | Lukas | Walmart | 18.1 | 33 | 2 |
| **29** | SCHWARZMANN | Stephen | Investments | 17.7 | 72 | 3 |
| **30** | ICAHN | Carl | Investments | 17.6 | 83 | 4 |
| **31** | PETTERFY | Thomas | Discount brokerage | 17.5 | 75 | - |
| **32** | BREN | Donald | Real Estate | 17.0 | 87 | 4 |
| **33** | SCHMIDT | Eric | Google | 14.2 | 54 | 3 |
| **34** | JOHNSON | Abigail | Fidelity | 14.0 | 57 | 3 |
| **35** | COHEN | Steve | Hedge funds | 13.6 | 63 | 3 |
| **36** | OMIDYAR | Pierre | eBay, PayPal | 13.1 | 52 | 5 |
| **37** | NEWHOUSE | Donald | Media | 12.8 | 90 | 2 |
| **38** | GRIFFIN | Ken | Hedge funds | 12.7 | 51 | 4 |
| **38** | TEPPER | David | Hedge funds | 12.0 | 62 | 3 |
| **40** | MOSKOVITZ | Dustin | Facebook | 11.6 | 35 | 5 |

*Source: Forbes (2019)*

Two comments:

- **First, these efforts vary considerably from country to country. If, on average, philanthropic donations represent 2% of GNP in the United States, they represent less than 0.15% in Germany and a little more than 0.30% in France, or respectively 15 and 6 times less.** The difference is of course in the behavior of the ultra-rich, but also in the fact that donations come from almost all segments of the US population, which is not the case in many countries.

This explains why the United States is a special case in this area. And again, the figure mentioned above only counts the money paid, not the time spent managing foundations and philanthropic works. This "American tradition" is indicative of the role played by solidarity (in the form of money, energy, or time spent) in certain societies and certain forms of capitalism (Protestant capitalism, for example). As M. de Rosen (2020) notes, such a tradition, which is too underdeveloped (especially in France), "*should be highlighted by the media, by local authorities, by the State itself. A rich person who is taxed more feels robbed. He then readily considers moving abroad. A rich person who gives to a cause of general interest is proud of it. He makes his contribution, he can participate in the action that he defines as urgent*". But many are those, in Europe, who consider these moral intentions as signs of vanity … (see the comments of many media with regard to the intentions of the ultra-rich who mobilised for the reconstruction of Notre-Dame de Paris, destroyed by fire in April 2019).

- **Second, even if donations and foundations are numerous in the United States, the debate is intense between billionaires**. Those who are generous and plead for a heavier tax are well-known: Bill Gates, Warren Buffet, George Soros, Michael Bloomberg, Ray Dalio (Bridgewater), Eli Broad (Kaufman and Broad), Marc Benioff (Salesforce) … but they represent only a small portion of America's 600 billionaires. Many of them are silent on the subject, while others clearly have more individualistic views, going so far as to relocate their businesses to another American state in order to pay less tax (in Florida for Carl Icahn, David Tepper (Appaloosa Management) …).

Initiatives, bringing together billionaires or multinational firms, are emerging elsewhere. Thus, in France, Serge Weinberg and Denis Duverne launched in December 2018 an initiative entitled "Change through donation / "Changer par le don", directly inspired by The Giving Pledge. The ambition is to encourage the wealthiest people to donate at least 10% of their income or wealth to philanthropic works. The then CEO of Danone, Emmanuel Faber, has also created a platform, "Business for Inclusive Growth" (B4IG) bringing together around forty multinationals. Launched at the G7 summit in Biarritz on August 23, 2019, the B4IG coalition is hosted at the OECD office in Paris. Its goal is to fight inequalities, identify and fund the best social innovation projects. In May 2020, in response to the health crisis caused by COVID-19, members of the coalition announced unprecedented financial support, and launched a collective call for an inclusive recovery, to help underprivileged children, women and low-income workers who bear the brunt of the crisis.

### 17th debate: The role of private debt in inequality

For German economist Daniel Stelter (2017), Piketty, observing only one symptom, failed to grasp the real cause of inequality. According to him, "*Thomas Piketty ignored the real cause of inequality: the increase in debt for 30 years.*" This is an original

contribution to the debate on inequalities. Already in 2014, G. Giraud highlighted an important cause of wealth inequalities: the real estate sector, and particularly in large cities, where bubbles form. The rise in real estate prices increase the capital of the richest households, those who have easier access to credit. This situation allows them in particular to carry out financial transactions with a high leverage effect.

**Stelter challenges the model that in the long run the growth of fortunes exceeds that of the economy. According to him, this only happens in an extremely short period of time**. We cannot conclude that inequalities are growing by limiting ourselves to data before taxes and social transfers, which in fact reduce these inequalities. Even more serious, according to Stelter and Giraud, is the fact that Piketty considers the role of debt to be neutral in the evolution of inequalities. It takes into account net worth, that is, the total wealth reduced by debt. In doing so, he sees only one symptom and ignores the real cause of inequality: the increase in debt over the past 30 years.

People who have access to cheap money and financial markets have been able to take on debt to increase their wealth. According to Piketty, the real cause of the increase in wealth inequalities is that the return on capital exceeds the rate of economic growth, and the wealthy earn extra returns because of their management skills. Stelter's analysis is different, and he considers that **wealth inequalities stem from the cheap money policy orchestrated by central banks and the increase in debt. It is access to (cheap) credit that feeds the growth of wealth.**

Piketty's solution to inequalities goes through redistribution from the rich to the state and through confiscatory taxes. In his approach, he is (only partially) interested in public debt, and he completely ignores private debt. It also ignores the role of implicit debts, that is to say the financing promises linked to demographic aging. One of the big decisions of political decision makers at the moment is how to solve the debt problem, to decide who is going to pay or not... The issue of inequalities changes singularly as soon as we put in debt - public but also private - at the centre of the debates. That's the interesting point of Stelter's approach.

### 18th debate. Fair vs. unfair inequality: we must promote merit and fight against privileges, not euthanise capital

Any research on inequalities should question the nature of these inequalities. Are they (systematically) unfair, can they be fair? Beyond this crucial question obviously arises the very origin of inequalities. This will determine how to reduce them without negatively impacting social cohesion, the productive apparatus, motivation or merit.

In his Theory of Justice (1971), J. Rawls, a philosopher or equality, conceded that there can be fair inequalities, that is, inequalities which reconcile the demands of freedom, equality and responsibility[6]. This original thesis comes down to considering the

[6] *According to J. Rawls, social and economic inequalities must meet two conditions: i) they must first be attached to functions and positions open to everybody, under conditions of fair equality of opportunity; ii) they must provide the greatest benefit to the most disadvantaged members of society.*

problem of the effectiveness of inequalities in terms of social justice. The idea is to only accept inequalities that serve the goal of social justice.

In a purely liberal approach, everyone's situation is strictly a matter of individual choices. Social inequality is directly linked to the particular merit of the recipient and the inadequacies of the recipient. There would therefore be no privileged, but more talented, more efficient, more voluntary, more ambitious people, able to take more personal risks and make more personal sacrifices ... Benefits (not privileges) are associated to such a situation. Income inequality will thus be said to be "fair" provided that the transactions at the origin of these inequalities are not dishonest, and that they reflect real merits. There is an idea of merit behind the concept of justice (giving everyone what is due).

A benefit would therefore be unfair if it is not deserved: one cannot deny the inadequacies of such a conception of justice. No one is in control of their choices, which are sometimes very strongly determined by birth, education, training ... i.e. "*social contingencies*" (Rawls (1971)). In this sense, in real life, all inequalities are not fair. The republican doctrine of equal opportunities through school clearly expresses this sensitivity: individual merit does not cease to be a good criterion of justice, but one has to ensure that the social context allows it to play this role. Equality of opportunity is ensured when the social status of individuals of one generation does not depend on the moral, ethnic, religious, financial and social characteristics of previous generations, but only on the service they can provide to society. The equality of opportunity favours the development of fair inequalities, those which are legitimized by the personal efforts of the individual and the accomplishment of the work which is asked of him.

Access to education, health, culture, redistribution policies are all avenues taken to reduce inequalities linked to social determinism, and to improve initial chances and support equal opportunities (promote social ladder) Some are more radical, going so far as to advocate confiscatory tax measures (on income, capital, wealth, inheritance, etc.), or even the outright abolition of inheritance. Piketty can be considered as a person recommending radical solutions (see below, 19$^{th}$ debate).

Note that egalitarianism induces the euthanasia of capital and the violation of fundamental rights; it infringes the right to property, and it is detrimental to the efficiency of the production apparatus.

It should also be noted that the adoption of drastic measures would not eliminate all the initial inequalities, because we do not all have the same aptitudes (talent, will, taste of effort and sacrifices, ambition, luck, etc.), which the philosopher John Rawls calls "*natural contingencies*". The only effect of these measures would be to spare the deserving (and "successful") individual the suspicion of having been backed by a class advantage. But the negative effects (on motivation, innovation, investment ...) would outweigh the positive effects.

Natural inequalities do exist, and they are in no way linked to any law of capitalism. D. Maillard (2016) recalls the importance of beauty or size on activity income, the

importance of the social environment on the awakening of children[7] ... is it fair, unfair? What is certain is that we cannot correct this ... except to eliminate not only the inheritances, but also the family (Munoz-Dardé (2001)).

Not without humour, J. Stiglitz (2018) for his part indicated that "*the best thing to do for a career is to choose good parents at birth*". D. Maillard is clear: if we want to improve the condition of our children, there are "two levers: saving and improving human capital, his own and that of his children. In short, to be rich, you have to do what the rich do; for children to be rich, you have to do what rich parents do". The state cannot do everything, even if it is obvious that it can help improve the chances of the less privileged classes. Access to the labour market is often a major cause of failure to realize the potential of children from poor and modest families.

Reducing inequality does not necessarily mean levelling up, but rather it is raising the bottom. It is not a question here of redistribution (even of assistantship or alms), or of setting up social classes against each other, but of creating opportunities, motivation, hope for people in need. An asset in terms of social cohesion..

## 19th debate: How to curb inequality? Piketty's proposals under question

Piketty's work has deservedly received rave reviews. His work has become a sort of social phenomenon, and as Y. Allaire and Firsirotu (2014) point out, his book "Capital in the 21st century" became "*the darling of the American, even global, left*". The methodology, data and conclusions have, however, as we have just seen, been the subject of much criticism, as have the measures proposed to correct the inequalities. Nor does Piketty justify the need to put inequalities at the centre of the problem. Michael D. Tanner, of the Cato Institute, criticises Piketty for taking for granted the misdeeds of inequality, and only the misdeeds (Tanner (2017)). The rise in inequalities (appearance of ultra-rich categories, widening of the differences in wages and wealth between the poorest and the richest, ...) goes hand in hand with a considerable reduction in poverty (this is currently the case in countries emerging markets, particularly in China). To say that growth creates inequality is reductive. In economies that are much more productive than one or two centuries ago, everyone can have access to goods and services (health, education, culture ...) which were not even available to the richest a few decades ago.

In his book "Capital and Ideology (2020), Piketty wanted to show that it is the fight for equality and education, and not the "*sanctification of property*", that has enabled economic development and human progress. Drawing on the lessons of global history, he imagines a participatory socialism for the twenty-first century: a new egalitarian horizon with a universal aim, a new ideology of equality, social property, education and sharing of knowledge and powers. Looking at France, Th. Piketty thus offers different

[7] *D. Maillard (2016) recalls the results of a study by the University of Texas indicating that very young children in the upper class hear on average 2,100 words per hour, against 1,200 words in the middle class and 600 for recipients of social assistance. At three years old, a child from the upper classes would have heard 30 million more words than a poor child.*

avenues (a sort of summary of his previous recommendations) to put an end to the concentration of capital. According to him, it would be necessary to **modify the social ownership and co-management of companies**: employees should receive 50% of the seats on the boards of directors and the voting rights of the largest shareholders should be capped by law (as a for example, the largest shareholders should not have more than 10% of the voting rights in large companies). **The notion of temporary property should also be introduced**: a progressive annual tax on property should be created, the rates of which would range from 0.1% for small patrimonies (up to 100,000 euros) to 90% for higher patrimonies (i.e. higher to 2 billion euros). **Creating a universal capital endowment and promoting the circulation of property** are essential for curbing inequalities: at 25, everyone should receive the equivalent of 60% of average wealth, or 120,000 euros, financed by the progressive property tax. **Higher income and inheritance tax rates** should be raised (Piketty mentions the figure of 90%). **An effective and verifiable rebalancing of educational expenditure in favour of disadvantaged areas** would improve justice in education. In the fourth part of "Capital in the 21st Century", Piketty also proposed the establishment of **a progressive capital tax** applied simultaneously, with the same rate and base, on the whole planet. A utopian proposal when we know that the establishment of such a tax would require perfect coordination at the global level (at the risk of promoting tax evasion in the direction of countries that have not adopted this type of tax). A "*useful utopia*," conceded Piketty ... provided the tax rate is not once again confiscatory. "*The euthanasia of capital, which claims to build an improbable capitalism without capitalists, kills growth and jobs". "In a market economy, capital does not have the primary function of producing rich people, but of financing investment that incorporates the advancement of technology and knowledge*" (N. Baverez (2013)). The confiscation and abolition of capital leads to egalitarianism, not social justice. In the same way, property spoliations reduce the space that allows an individual to develop his life projects. This is why Piketty's extreme measures are strongly contested (and why the conceptions of J. Rawls are globally more consensual than those of Piketty).

"Confiscatory" tax rates of income, capital and property has been the subject of very many criticisms, in particular on the denial of meritocracy and on the sincerity of tax evasion or brain drain to more tax-friendly countries. Asked about the possible tax evasion that the tax rates he proposes would produce, Piketty argues that these ideas are "fantasies", a somewhat abrupt answer. Moreover, this desire to "sanction" billionaires (to abolish them, to use the expression of Elizabeth Warren, candidate during the last American presidential campaign) comes up against practical constraints. To ensure the payment of the tax in question, billionaires would have to sell a very large part of their wealth, which would undoubtedly lead to a collapse in prices (who to buy these assets?), ultimately penalizing everyone. Doesn't such a measure run the risk of creating a certain confusion between wealth, heritage, patrimony and productive capital? According to The Economist (2014), Thomas Piketty "*asserts rather than explains*" why decreasing the concentration of wealth should be the

priority (compared to other economic policies). He would not describe the costs of his redistributive program in any way and would reject entirely the consequences that an increase in taxes on income and wealth can have on entrepreneurs and risk taking.

One should nevertheless admit that the progressivity of the tax does exist well … but up to a certain threshold. Landais – Piketty and Saez have shown this progressivity becomes regressiveness for the 5% of the richest French and especially the 1% of the richest. In total, the progressivity works for the vast majority of households, but it is no longer progressive enough. This explains why the work of Piketty and his team focuses on the ultra-rich.

In an article co-authored with Firsirotu and Dauphin (2014), Yvan Allaire, executive president of the Institute on Governance of Quebec, also expressed strong reservations about Thomas Piketty's proposals. These authors propose different measures likely to have a clear and significant impact on economic inequality, in particular a quality education system accessible to all (regardless of family situation), and the modification of certain taxes relating to executive compensation. They do not promote any "confiscatory" tax rates of income and property. They recommend less "spectacular" measures, in particular i) a change in the tax provisions to eliminate tax arrangements where they favour executive compensation schemes in the form of stock options and restricted stocks, ii) the gradual elimination by corporate boards of stock options as a form of compensation, as well as any other form linking compensation to the value of the corporation's stock, iii) limits set by the board of directors on the ratio of the CEO's compensation to the firm's median compensation, iv) Implementation of compensation schemes which are sensitive to social issues of income inequality within society. Governments should also calibrate the tax on capital gains according to the holding period: the shorter the holding period, the higher the tax rate on capital gains.

### 20th debate. Decline in inequality – "Four horsemen of levelling" (Schiedel) vs. conscious political rupture (Piketty)?

Apart from Piketty's book, other authors are interested in the long history of income and wealth inequalities. We can mention for example Jared Diamon or Walter Scheidel.

Geographer and biologist J. Diamon (2000) wanted to explain why wealth and power are distributed so unequally between areas and countries, and why it is not the natives of America, Africans and Australian aborigines who have decimated, enslaved or exterminated Europeans and Asians. The author draws on several disciplines such as genetics, molecular biology, linguistics, epidemiology, archeology, the history of technologies, biogeography … and his observations span several millennia. A large-scale job. According to him, it is the differences of environment (geography, more or less favourable, the unity of a country (sometimes a drawback), and political centralisation (often a handicap)) which are responsible for the development of techniques and political systems, not genetic or climatic differences. He concludes that the causes of the inequalities of the modern world are to be found in the state of the world as it had become in the 15th century, well before the advent of modern capitalism.

Historian W. Scheidel published in 2017 an essential work for understanding inequalities, a saga on the history of inequality, from the Stone Age to the 21st century. Its objective was to identify the factors of liquidation of extreme inequalities and of progression of equality. Scheidel is a historian: he is not constrained by any theoretical construction, underlying assumptions, a theoretical corpus, causal links of equations … or considerations of economic policy. This is not the subject of his work. But while Piketty considers the reduction in inequalities that took place between World War I and 1970 is linked to a political awareness of the problem, Scheidel puts in perspective all the periods of reduction in inequalities in the context of long cycles. The history of inequality can be summed up as long periods of growth in inequality alternating with shorter periods of reduction - often brutal -. According to his work, long periods of growing inequalities correspond to periods of peace, allowing the accumulation of capital and wealth and promoting economic prosperity. On the other hand, periods of reduction in inequalities correspond to phases of destruction of wealth: he thus puts forward four determining factors: war, revolution, the collapse of states and pandemics, what the author calls the "Four Horsemen of Levelling". When these horsemen appear, they ruin all populations and even more so the populations who hold capital. A constant throughout history is that there are phases of massive reductions in extreme inequalities. Scheidel also shows, like Piketty, the persistence of certain forms of inequality, but his message is different: the phase of reducing inequalities that we experienced between 1918 and the 1970s would not be linked to any political awareness whatsoever, but to the shock wave of the 1914-1918 war and the communist revolution. Likewise, the phase of rising inequalities that we are currently experiencing would, on the other hand, be linked to the situation of peace which has reigned since the Second World War. Knowing that the phases of increase in extreme and relative inequalities also go hand in hand with an enrichment of the less privileged classes and a reduction in poverty and extreme poverty, it is probably better to rejoice in the phases of peace than phases dominated by the four horsemen of leveling …

# Conclusion

T. Piketty highlights the resurgence, as massive as it is recent, of the growing weight of capital (relative to economic activity) and of strong inequalities in the distribution of income. The relatively egalitarian world of the "Thirty Glorious Years" (1945 -1975) is being replaced by once again very unequal societies, with a force of inertia notably in terms of wealth inequalities. According to Piketty, these developments respond to a logic of capital accumulation that has been effective for a long time, but the effects of which were delayed, in the 20th century, by the succession of wars, tax policies not very favourable to rentiers and strong growth in the post-war period. As these three favourable factors more or less disappeared in the 1990s, it is to be feared that inequalities will widen very sharply. Piketty concludes that the best way to counter this trend is to implement a progressive global capital tax.

No one is disputing that Piketty's book is ground-breaking, that his research and that of his team (E. Saez, G. Zucman, F. Alvaredo and L. Chancel ... among others) are fundamental, or that their databases and reports (https://widworld/) are invaluable. Moreover, as noted by a former French planning commissioner (P.-Y. Cossé), this research "*puts economics back in history*", which is commendable. Deirdre McCloskey (2014) is highly critical, but she nevertheless considers that "*Piketty's great splash will undoubtedly bring many young economically interested scholars to devote their lives to the study of the past. That is good, because economic history is one of the few scientifically quantitative branches of economics. In economic history, as in experimental economics and a few other fields, the economists confront the evidence (as they do not for example in most macroeconomics or industrial organization or international trade theory nowadays)".*

As D. Gordon noticed, "*proclaimed a masterpiece by Paul Krugman and worthy of a Nobel Prize for its author by Larry Summers, it perfectly encapsulated and extended a familiar narrative of anti-capitalist propaganda*".

However, the World Bank, the IMF, multiple academics, and the US Bureau of Labour Statistics have all challenged Piketty's findings on inequality. Paul Krugman is often presented as a supporter of "Capital in the 21st century", "*an awesome work. At a time when the concentration of wealth and income in the hands of a few has resurfaced as a central political issue, Piketty doesn't just offer invaluable documentation of what is happening, with unmatched historical depth. He also offers what amounts to a unified field theory of inequality, one that integrates economic growth, the distribution of income between capital and labour, and the distribution of wealth and income among individuals into a single frame*" (Krugman 2014). However, P. Krugman is also sceptical about Piketty's findings: "*I am more or less persuaded by Piketty's explanation of the surge in wage inequality, though his failure to include deregulation is a significant disappointment. But as I said, his analysis here lacks the rigor of his capital analysis*" (Krugman 2014). Deirdre McCloskey (2014) goes further, considering Piketty's book as "*a brave, but a mistaken book*".

The evolution of market economies has allowed an unprecedented decline in poverty, especially at the global level, and an extraordinary reduction in other inequalities, particularly in terms of access to consumption, education, health, longevity, gender … Market economies have made - and still allow - many people to enrich themselves and escape poverty. The case of Asia over the past 20 years is enlightening in this regard. Piketty's analysis can be criticised for focusing on the "1%" enrichment and sometimes exaggeratingly overlooking the "99%" enrichment. How to ensure that the enrichment of some can best serve the interests of a collective without using confiscatory measures? This is the ambition of public policies. Piketty thinks about the appropriation of wealth but forgets the development of wealth. This is why his proposals are unrealistic. And without the protection of private property, there is no innovation; without innovation, no growth.

The purpose of this Discussion Paper was to present the main debates around Piketty's theses. As seen in the different chapters, the main arguments of the anti-Piketty camp refer to many different fields. Problems with data and methodology, confiscatory tax cuts, the importance of interclass transfers, the absence of human capital, the progressive liberalisation of the US economy, facts on heritage, the role of private debt, income volatility and the instability of the richest 1% segment are all factors that weaken or disprove Piketty's findings. The theoretical framework is also debated, especially regarding the way the neoclassical theory is used, and regarding the three "so-called" fundamental laws of capitalism: i) the share of capital income in total income equals the rate of return on capital multiplied by the capital income ratio (Law 1); ii) the rate of growth of national output equals the savings rate out of national output (net of depreciation) divided by the capital-output ratio (Law # 2), and iii) the rate of return on capital systematically exceeds the rate of growth (Law # 3, considered by Piketty as "*the central contradiction of capitalism*"). The inversion of existing relations (the inversion of the definition of the rate of profit in Law 1, the inversion of the Harrod – Domar equation in Law 2), and the questionable link between inequality and $r > g$ (Rate of return on capital (r) > Income growth rate (g)) have been the subject of numerous theoretical and empirical studies which thwarted Piketty's results.

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