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Thomas Piketty and the Search for *r*

Michael Roberts
Independent Researcher
bobmckee99@yahoo.com

Abstract

Thomas Piketty's magnum opus on the accumulation and distribution of wealth over the last 200 years has been greeted with the biggest noise from mainstream (and heterodox) economics of any economics book. Piketty shows that inequality of wealth and income is inherent to capitalism and it is getting worse. The reason for the rise in the inequality of wealth is a rise of income going to capital in the form of profits, rent and interest. Inequality is not due to higher-skilled labour getting higher income than the lower-skilled. The central question for Piketty's thesis is whether rising inequality is the central contradiction of capitalism and thus its gravedigger. Is it a tendency for a rising net return on capital (Piketty) or is it the tendency for a falling rate of profit (Marx) that is the key contradiction of capitalism in the twenty-first century?

Keywords

inequality – wealth – income – profit – Marx – *Capital* – capitalism – growth

Thomas Piketty's magnum opus on the accumulation and distribution of wealth over the last 200 years has been greeted with the biggest noise from the great and good in mainstream (and heterodox) economics of any economics book, possibly ever.[1] It has become an Amazon non-fiction bestseller.

1 Thomas Piketty's *Le capital au* XXI*e siècle* was published in French in August 2013. But until it was published in the language of modern imperialism, English, it did not get much coverage except among non-English-speaking economists. The English-language version (Piketty 2014a) was translated by Arthur Goldhammer and published by Harvard University Press; all page-number references are to this edition.

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There has been a profusion of reviews, televised debates and interviews with the man of the moment. In the Anglo-Saxon world, it has been greeted rapturously. Branko Milanovic, the expert on the inequality of wealth in the world, called it 'one of the watershed books in economic thinking'.[2] The guru of liberal Keynesian economics, Paul Krugman, writing in *The New York Review of Books*, said it was 'truly superb'.[3] Martin Wolf of the *Financial Times* called it 'extraordinarily important' and 'awesome'.[4] John Cassidy, in *The New Yorker*, said 'Piketty has written a book that nobody interested in a defining issue of our era can afford to ignore'.[5]

Rising Inequality

As Piketty says in his Preface, this book is the culmination of 15 years of research in collaboration with other great scholars of inequality of wealth and income in modern economies, including Anthony Atkinson and Emmanuel Saez. That research has shown that, particularly since the early 1980s, inequality of income and of wealth has increased significantly in most advanced economies, particularly in the US and the UK.[6] Indeed, globally, Credit Suisse and the United Nations economists find that just 85 people own as much wealth as the poorest one-half of the world's people, 3.5 billion.[7]

Piketty's book is bursting with data – and this is all to the good. The merit of Piketty's opus is that it compiles evidence and tries to develop a theory and laws therefrom. For example, as he says,

> [A]ll social scientists ... and especially all citizens should take a serious interest in money, its measurement, the facts surrounding it, and its history. Those who have a lot of it never fail to defend their interests. Refusing to deal with numbers rarely serves the interests of the least well-off.[8]

2 Milanovic 2014.

3 Krugman 2014.

4 Wolf 2014.

5 Cassidy 2014.

6 See Piketty and Zucman 2013.

7 Oxfam International 2014. Actually it is probably only 67 people since Oxfam's data were compiled, according to the website of the independent-left Senator Sanders of Vermont – see Moreno 2014.

8 Piketty 2014a, p. 577.

However, compiling lots of data can lead to errors of measurement, difficulties in interpretation and bias in analysis. And this is exactly where recent criticism of Piketty's book has concentrated.[9]

Data are always inadequate and often inconsistent and it is also easy to make simple mistakes. But it is better to try and provide evidence and, above all, release sources and your workings for all your data so that others can check and, even better, try and replicate your results. That is the scientific method. At the very least, he puts all his data and workings on line for people to consider.[10] He has been more transparent that most with his evidence. Piketty also argues that more recent work on inequality of wealth by his colleagues, Emmanuel Saez and Gabriel Zucman, using different measurement methods 'confirm and reinforce my findings'.[11] Thus Piketty reckons that any mistakes or biases in his own data 'will not have much of an impact on the general findings'.[12]

But in this book Piketty goes much further than just reiterating the statistical evidence that he and others have compiled on inequality. He sets out to show that there are some powerful laws in capitalism that he has identified which forecast that inequality of wealth will rise through the rest of this century to levels not seen since before the end of the nineteenth century.

Far from modern economies becoming more meritocratic and reducing the inequalities of the past through increased economic growth and technological advance, as predicted by Simon Kuznets and other mainstream economists,[13] the degree of inequality is returning to the levels of 'patrimonial capitalism' when a small oligarchy of landowners and financiers took the lion's share of

9 The *Financial Times*'s economics editor Chris Giles has gone through the data used by Piketty. Giles found that Piketty had made some simple mistakes in transcribing some of his data. He also claimed that Piketty made 'arbitrary' changes in some of his estimated data without explanation. Piketty was alleged to have 'cherry-picked' his data sources, using different measures in different countries at different times. Giles made new calculations with other data sources and found that there is no 'obvious upward trend' in inequality of wealth in Europe.

10 Piketty has vigorously defended his work from Giles's critique. See Piketty 2014b.

11 See Saez and Zucman 2014.

12 In a ten-page open letter posted online, Piketty defended his use of data and his overarching conclusion. He argues that apparent transcription errors were deliberate adjustments and he defends his use of certain data sources over others. See Piketty 2014c.

13 Kuznets 1955. Kuznets predicted that inequality in economies would take the form of a bell curve: rising inequality as market economies emerged, then as they matured, falling inequality. In contrast, Piketty sees a U-curve: high inequality with a brief period of lower inequality and then a return to high inequality. See Piketty 2014a, p. 13.

wealth while the rest were impoverished. Piketty calls this future 'potentially terrifying'.[14]

Following Marx?

The title of Piketty's book is a clear allusion by him to Karl Marx's book of the same name, *Capital*, published in 1867. Piketty is suggesting that he is updating (and indeed correcting) Marx's analysis of nineteenth-century capitalism for the twenty-first century.

Piketty was brought up in Clichy in a mainly working-class district and his parents were both militant members of Lutte Ouvrière [Workers' Struggle] – a Trotskyist party which still has a significant following in France. On a trip with a close friend to Romania in early 1990, after the collapse of the Soviet empire, he had a revelation: 'This sort of vaccinated me for life against lazy, anti-capitalist rhetoric, because when you see these empty shops, you see these people queuing for nothing in the street', he said, 'it became clear to me that we need private property and market institutions, not just for economic efficiency but for personal freedom.'[15] Thus, Piketty rejected what he saw as Marxism for social democracy. He was an adviser to Ségolène Royal in 2007, when she was the Socialist candidate in the presidential elections.

According to Piketty, Marx needs correcting because, despite his clever intuition that 'private capital accumulation could lead to the concentration of wealth in ever fewer hands',[16] he got the whole mechanism for this development totally wrong. Marx thought that capitalism would have an 'apocalyptic' end but thanks to 'modern economic growth and the diffusion of knowledge' that has been avoided. But there is still the problem of the 'deep structures of capital inequality'. Piketty goes on: the basis of Marx's prediction of an apocalyptic end to capitalism was that 'either the rate of return on capital would steadily diminish (thereby killing the engine of accumulation and leading to

14 'This inequality expresses a fundamental logical contradiction. The entrepreneur inevitably tends to become a rentier, more and more dominant over those who own nothing but their labor. Once constituted, capital reproduces itself faster than output increases. The past devours the future. The consequences for the long-term dynamics of the wealth distribution are potentially terrifying' (Piketty 2014a, p. x).

15 Interview with Matthew Iglesias (Iglesias 2014).

16 Piketty 2014a, p. 1.

violent conflict among capitalists) or capital's share of national income would increase indefinitely until the workers went into revolt.'[17]

Marx reckoned that wages would be stagnant or falling. This was wrong because 'like his predecessors Marx totally neglected the possibility of durable technological progress and steadily increasing productivity, which is a force that can to some extent serve as a counterweight to the process of accumulation and concentration of capital'.[18] Unfortunately, you see, Marx failed to use the statistics available in the nineteenth century and 'devoted little thought' to how a non-capitalist society might work. If he had done so, he might have sorted out his mistakes.

Already, it will be clear to a student of Marx's analysis of a capitalist economy that Piketty is unaware that Marx saw the drive to raise the productivity of labour through technological advance as the flipside of the accumulation of capital. Instead, as usual, Piketty adopts the neoclassical distortion that Marx's theory is based on an 'iron law of wages' and a zero rise in productivity: 'Marx's theory implicitly relies on a strict assumption of zero productivity growth over the long run'.[19]

This is not surprising when we learn that Piketty admits that he has never read the very book that carries the same name as his:

> I never managed really to read it. I mean I don't know if you've tried to read it. Have you tried? ... *The Communist Manifesto* of 1848 is a short and strong piece. *Das Kapital*, I think, is very difficult to read and for me it was not very influential ... The big difference is that my book is a book about the history of capital. In the books of Marx there's no data.[20]

Capital versus Wealth

But no matter, for now, let us consider Piketty's 'superior analysis' of the laws of motion of capitalism in the twenty-first century. To do that, we must first consider Piketty's definition of capital. For Piketty, 'Capital is defined as the sum total of nonhuman assets that can be owned and exchanged on some market. Capital includes all forms of real property (including residential real estate) as well as financial and professional capital (plants, infrastructure, machinery,

17 Piketty 2014a, p. 9.
18 Piketty 2014a, p. 10.
19 Piketty 2014a, p. 27.
20 Interview with Isaac Chotiner (Chotiner 2014).

patents and so on) used by firms and government agencies.'[21] In effect, for Piketty, capital and wealth (mainly personal wealth) are the same. 'To simplify the test, I use the word capital and wealth interchangeably as if they were perfectly synonymous'.[22]

This is clearly different from capital as defined by Marx. For Marx, capital is a social relation specific to the capitalist mode of production. It is self-expanding value. Value comes from the exertion of labour and is realised on a market. It is measured in labour time (and in its monetary expression). Under the capitalist mode of production, the owners of the means of production put workers and machinery to work to produce things or services that people need (use-values) but they only do so if value is also created (specifically, surplus-value).

Under the capitalist mode of production, things and services that people need are produced simply as a money-making exercise, but this money comes from value created by the exertion of labour power, with the surplus over and above the living needs of labour appropriated by the owners of capital. Thus the circuit of capital, for Marx, is M–C … P … C1 to M1, namely capitalists have money-capital (M) which is invested in commodities (C), means of production and raw materials, which are used by labour in production (P) to produce commodities (C1) for sale on the market for more money (M1). Capital (M) expands value to accumulate more capital (M1). But only labour created that new value.

For Piketty, this process and its social relation are ignored. Capital is wealth and wealth is capital. Wealth existed before the capitalist mode of production became dominant in the world, so wealth is not specific to capitalism. Indeed, wealth is really a measure of accumulated assets, tangible and financial. Wealth/capital is in all societies.

So for Piketty, the capital process is M … M1. Money accumulates more money (or wealth). It does not matter how and so there is no need to define capital as different from wealth. This is what Marx called 'vulgar economics', i.e. failing to see the underlying process of accumulation and just observing the appearance – indeed seeing things from the point of view of the holder of wealth. As he says, in the novels of Jane Austen or Balzac, all the characters who are holders of wealth live off the income from that wealth.[23] All they were interested in was the return on that wealth, not how it was generated (whether by slaves, land rents or interest on consols).

Piketty specifically rules out the approach of the classical economists and Marx: 'Some definitions of capital hold that the term should apply only to those

21 Piketty 2014a, p. 46.

22 Piketty 2014a, p. 47.

23 Piketty 2014a, p. 53.

components of wealth directly employed in the production process . . . this limitation strikes me as neither desirable nor practical.'[24] '[So] I ruled out the idea of excluding residential real estate from capital on the grounds that it is "unproductive" unlike productive capital used by firms and governments . . . the truth is that all these forms of wealth are useful and productive and reflect capital's two major economic functions'.

Well, residential property is obviously useful to the user. It has use-value, as Marx would say. But this form of wealth is not productive of new value (or profit), unless it is owned by a real estate company which rents it out as a business. Nevertheless, Piketty concocts a way for this wealth to deliver income: 'residential real estate can be seen as a capital asset that yields "housing services" whose value is measured by their rental equivalent.'

Now Piketty might say: does this distinction matter? For Piketty, it does not, because income is income and wealth is wealth wherever it comes from. But it does matter if we are to understand better the laws of motion of capitalism. By including residential property, net financial assets and land in his definition of capital, Piketty reaches opposite conclusions from Marx on the return on capital, or what Marx called the rate of profit. And that matters. For a start, it means that Piketty is interested in the distribution of wealth and not in how it is generated. For him, the former provides the key contradiction of capitalism, while for Marx it is the latter.

The Contradictions of Capitalism

This brings us to what Piketty designates grandiosely as 'the first fundamental law of capitalism', namely that the capital/income ratio β is related to the capital share of income α, where r is the net rate of return on capital.[25]

This is an accounting identity. $\alpha = r \times \beta$. Capital's share of national income α is equal to the capital/income ratio β in an economy times the net rate of return on capital, r. So inequality of wealth, as expressed by capital's share of income, will rise if the rate of return on the existing wealth ratio (the capital/income ratio) rises. Alternatively, the wealth ratio will rise if capital's share of national income rises.

Piketty's r is central to this simple but illuminating analysis. And for him, his r is better than Marx's. As he says: 'the rate of return on capital is a central concept in many economic theories. In particular, Marxist analysis emphasises

24 Piketty 2014a, p. 48.

25 Piketty 2014a, p. 52.

the falling rate of profit – a historical prediction that has turned out to be quite wrong, although it does contain an interesting intuition.'[26] His net rate of return is a 'broader' notion than the rate of profit as it incorporates interest, rent etc. as well as profit. Piketty does not realise that Marx's rate of profit (as surplus-value divided by capital) is just as broad because surplus-value is divided into (not composed of) rent, interest and profit too.

However, argues Piketty, Marx was wrong because he reckoned that r would fall over time and that this causes recurrent crises. Instead, Piketty tells us that actually r does not fall over time but rises or at least stays pretty steady. So the issue for twenty-first-century capitalism is that: if r grows faster than g (net real national income growth), then capital's share of income will grow and the global capital/income ratio will eventually reach unsustainable levels. The crisis of capitalism is thus one of 'terrifying' social instability, not one of contradictions within the capitalist mode of production.

Indeed, there is little or nothing in Piketty's 685 pages about booms and slumps, or about the Great Depression, the Great Recession, or other recessions, except to say that the Great Recession was a 'financial panic' (as claimed by Ben Bernanke) and was not as bad as the Great Depression because of the intervention of the central banks and the state. There is nothing about the waste of production, jobs and incomes. Piketty adopts the usual neoclassical explanation that these events, like wars, were exogenous 'shocks' to the long-term expansion of productivity and economic growth under capitalism.[27] Crises are just short-term shocks and we can revert to his fundamental law instead 'as it allows us to understand the potential equilibrium level toward which the capital/income ratio tends in the long run when the effects of shocks and crises have dissipated'. Keynes might retort, 'We are all dead in the long run!'

The central crisis for capitalism is thus a distributional one as the net rate of return on capital outstrips the growth of net national income. 'The inequality r > g in one sense implies that the past tends to devour the future: wealth originating in the past automatically grows more rapidly, even without labour, than wealth stemming from work which can be saved.'[28] So even an 'apparently small gap between the return on capital and the rate of growth can in the long run have powerful and destabilising effects on the structure and dynamics of social inequality'.[29]

26 Ibid.

27 Piketty 2014a, p. 170.

28 Piketty 2014a, p. 348.

29 Piketty 2014a, p. 77.

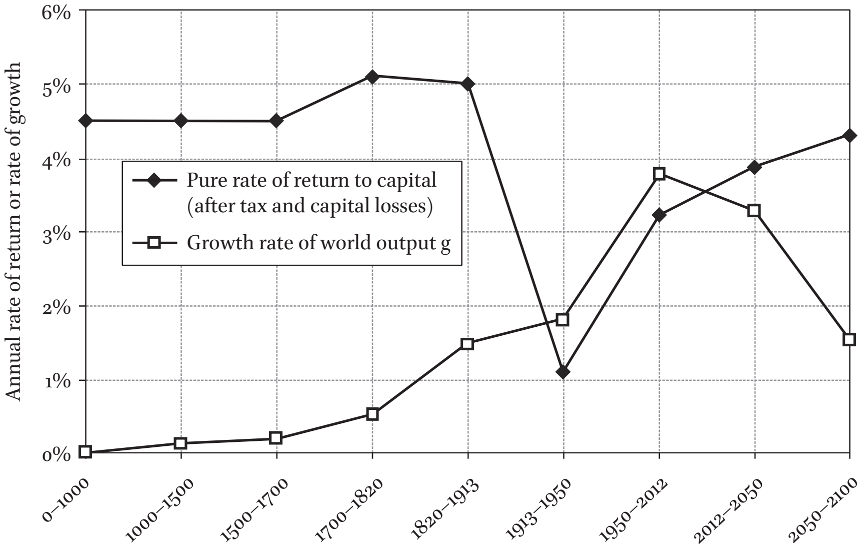

FIGURE 1 *After tax rate of return vs. growth rate at the world level, from antiquity until 2100*

The Nature of Piketty's *r*

For Piketty, a higher r than g is a tendency that is sometimes overcome by counter-tendencies, a divergence sometimes countered by convergence. For example, between 1913 and 1950, r fell sharply and so in the period after the war, g rose faster than r and inequality fell (Figure 1). Piketty prefers this temporal, even dialectical, approach to an economic law. Of course, this has been frowned upon by mainstream-economics reviewers who want the 'rigour' of some unrealistic dynamic stochastic equilibrium model that can then be tested against the evidence.[30]

The other side of the coin in Piketty's forecast that r will exceed g for the rest of this century and thus increase capital's share of income and inequality is the growth of net income, g. In a table on p. 63, of per-capita global income

30 Thus Brad DeLong writes: 'What are the serious complaints? … (2.) That Piketty's framework conceptualizes the issues in an unclear and counterproductive way by speaking of "tendencies" that can be counteracted, rather than doing the normal MIT economics thing – calculating a steady-state equilibrium growth path to which the economy converges over time, and then calculating how that equilibrium steady-state growth path can and does jump in a comparative-statics should the background economic conditions that determine where it is located shift.' (DeLong 2014.)

growth, Piketty shows that output per head has averaged 1.6% a year since 1700, half due to population growth and half to productivity growth. Growth rates of 3–4% only existed for brief periods. Also 'population growth is slowing from 1.3% a year to 0.4% by the 2030s' and 'there is no historical example of a country at the world technological frontier whose growth in per capita output exceeded 1.5% over a lengthy period of time'.[31]

So we cannot expect the world economy to grow at more than 1.2% a year. The twentieth century saw emerging economies such as Japan, Korea, China and India 'catch up' with slowing advanced economies and so keep the global rate high by historic standards. But in the twenty-first century there are no catch-up economies of any size left.[32] Economies have reached the end of the technology frontier.

Piketty's g is determined by historical evidence and forecasts. Similarly, Piketty's r is not some theoretical construct derived from the rational behaviour of economic agents, but based on his interpretation of historical data. That is its strength, but also its weakness.

Piketty claims that his r 'is pretty much steady around 4–5% but varies over time and between asset classes.'[33] The problem is that it does vary. Piketty's r seems to be an historic average of various returns on bonds, but is this return based on risk-free bonds or does it incorporate a risk premium? Historically, the return on equity capital is higher than the return on so-called risk-free bonds by around four percentage points. So on average, the yield on capital would usually have to be as high as 6–7%. But the long-term return on interest-bearing and dividend-bearing financial capital has been falling, not rising since the 1930s.[34] On current trends, it is heading for zero by 2050, not over 4%, as Piketty projects.[35]

But then, Piketty's r incorporates a synthetic return from 'housing services' (rents). Without that, Piketty's r would be falling, not rising. Indeed, the size of land and housing 'capital' in Piketty's global data was more than half by 2010 compared to much less than half in the 1940s. This is what affects r. The overall value of r has not changed because land has been replaced by capitalist-

31 Piketty 2014a, p. 93.

32 Piketty 2014a, p. 97.

33 Piketty 2014a, p. 55.

34 See Ibbotson and Sinquefield 2010.

35 Barry Eichengreen refers to IMF data that show real interest rates on bonds have been falling for three decades and, at 2–3%, are hardly above the potential growth rate of the major OECD economies. See Eichengreen 2014.

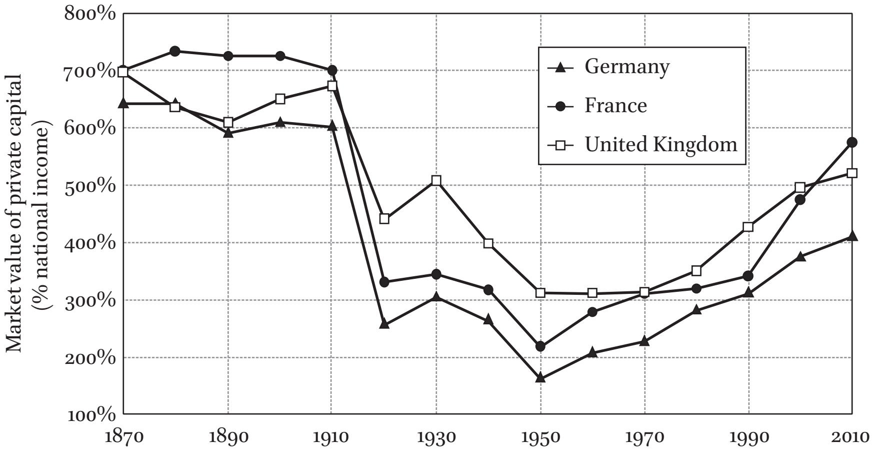

FIGURE 2 *The capital/income ratio in Europe, 1870–2010*

sector capital *but* mostly by housing.[36] Farmland was two-thirds of capital in the eighteenth century but hardly more than 2% in France and the UK now: 'once it was mainly land but has become primarily housing plus industrial and financial assets (half in half)'.[37] Publicly-owned assets are tiny: this is a capitalist society.

This has concerned other reviewers.[38] If capital includes net financial assets as well as tangible assets, then capital value can be volatile and deliver a net rate of return that is not steady. Piketty's data show that the biggest reversal of the inexorable rise in the capital/income ratio in the twentieth century took place during the Great Depression and the ensuing world war. This delivered a U-shape to the movement of the global capital/income ratio (Figure 2).

During the period 1929–46, the value of both physical and financial capital was decimated. Piketty's r fell because synthetic rents and returns on financial assets plummeted. The value of household wealth in financial and residential property also fell back sharply during the Great Recession of 2008–

36 Picketty 2014a, p. 118.

37 Picketty 2014a, p. 122.

38 James Galbraith contends that Piketty 'conflates physical capital equipment with *all* forms of money-valued wealth, including land and housing, whether that wealth is in productive use or not. He excludes only what neoclassical economists call "human capital," presumably because it can't be bought and sold. Then he estimates the market value of that wealth. His measure of capital is not physical but financial.' This leads to problems of measurement as asset prices are volatile, although Piketty claims that they are not over the long run. See Galbraith 2014.

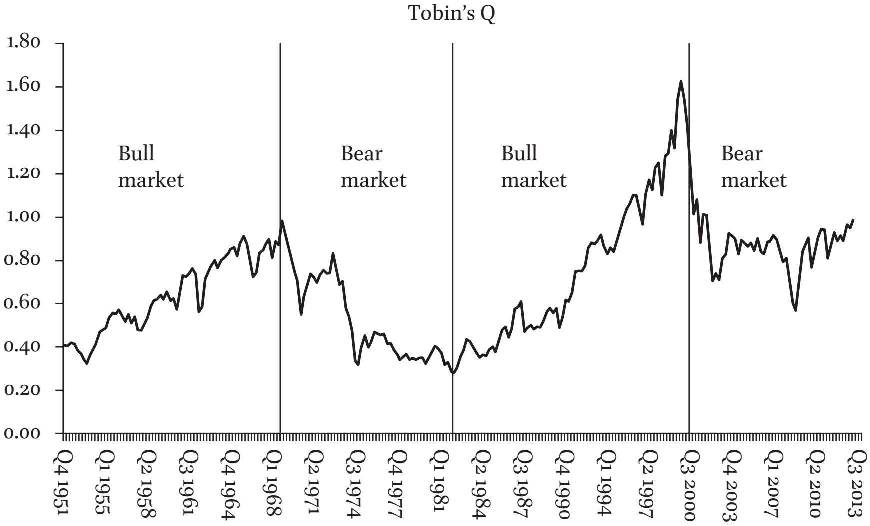

FIGURE 3 *Tobin's Q*

9. Households are still recovering that value. Piketty, of course, is aware of this and devotes some considerable space to arguing that over the very long run, the volatility of asset prices works itself out. Bubbles in asset prices take place, but there is still 'a long term trend at work'.[39]

Using Tobin's Q (which measures the market price of financial assets against the book value of corporate tangible assets), Piketty admits that an asset-price bubble accounted for one-third of the increase in national capital to national income in this period.[40] The period in which Piketty finds such a rise in his r, from the 1980s onwards (and thus a big jump in inequality), is precisely when financial-asset prices boomed (see Figure 3). However, over the long run, he expects Tobin's Q to be around one. It would have to be a very long run, because in the last 60 years Tobin's Q has been all over the place and hardly ever near one.

Will Inequality Rise?

This brings us to what Piketty, again rather self-importantly, calls 'the second fundamental law of capitalism'. This is $\beta = s/g$; in words: the capital/income ratio is equal to the savings rate divided by the growth rate . . . over the long

39 Piketty 2014a, p. 173.

40 Piketty 2014a, p. 191.

run. Piketty uses this law to project that the global capital/income ratio will rise from its current level of 4.5 times income to 6–7 times income, levels not seen since the days of 'patrimonial capitalism'. This happens if we assume that the net savings rate will be steady at 10% and g, the growth in net national income, will be 1.5%.[41]

The overall savings rate is composed of household savings plus the retained earnings of companies, after depreciation. But net national savings rates are nowhere near 10% globally right now. And how can we assume that the net savings rate will stay at 10% as growth in net national income slips to 1.5% as Piketty forecasts?

Piketty reckons that his 'second law' provides the explanation of why the global capital/income ratio will rise: net income growth (g) will slow while the net rate of return r will stabilise at a significant level above the growth rate, and the net savings rate will reach an equilibrium level over time much higher than now.

Here, Piketty turns to the traditional neoclassical aggregate-production function model developed by Robert Solow.[42] In this model, all 'factors of production' make a contribution to growth. If there is an increase in one factor relative to another in contributing to output, then its 'marginal productivity' will fall. Abundance of a factor, capital, will lead to diminishing returns on that factor. 'Too much capital kills the return on capital … it is natural to expect that the marginal productivity of capital decreases as the stock of capital increases'.[43] But Piketty reckons that r will not drop fast enough to stop the share of capital income from rising. The neoclassical model assumes infinite elasticity of substitution between capital and labour so the return on capital stays fixed.

This is a bogus assumption, to say the least, as many critics of this model of growth have shown. The great debate between the Cambridge economists of Massachusetts (Solow, Samuelson) and those of Cambridge, England (Robinson etc.) ended in defeat for the former. If capital is a physical entity in machines, plant, etc., it cannot be valued in money and it cannot be infinitely substituted for labour.[44] An economy's growth could still be wracked by short-term instability to take it off the 'equilibrium growth path'.

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41 Picketty 2014a, p. 173.

42 Solow 1956.

43 Piketty 2014a, p. 173.

44 Stephan Bergheim writes: 'At least since Wicksell it is well known that capital goods cannot be measured and aggregated in physical units because of their heterogeneity: how does one add up an airplane and a printing machine? Therefore valuation measures must be used. The value of a capital good can be the cost of its production or the value of the

Piketty's answer is to turn to the facts. The Cambridge debate could not be resolved because of a 'lack of data'. It does not matter who was right because the capital/income ratio has been rising in recent decades and that is all we need to know. 'This implies that the capital share in income is rising faster than the net rate of return is falling'.[45]

In effect, Piketty dispenses with his aggregate production model that aims to justify a long-run equilibrium savings rate through the rest of this century and adopts an institutional explanation, namely that the wealthy control government and ensure that they collect more rent, not their 'just' marginal return on capital. 'There is every reason to believe that r will be much greater than g in the decades ahead because of "oligarchic divergence"'.[46] This divergence is even greater because the rich hide their wealth in tax havens.[47]

The Nature of Marx's *r*

Piketty argues that Marx's r falls because in his model of capitalism there is 'an infinite accumulation of capital' and 'as ever more increasing quantities of capital lead inexorably to a falling rate of profit (i.e. return on capital) and eventually to their own downfall, while growth in net income (g) falls to zero.'[48]

Here Piketty imposes a marginal productivity theory of capital accumulation on Marx; abundance of capital leads to its diminishing returns. Actually, Marx rejected this scarcity theory.[49] For Marx, the movement in r is to be found not in infinite accumulation but in the rise in value of the means of production relative to the value of labour power. Piketty says that after World War II, capital was scarce and so the return on capital was high. Marx would have said capital values had been destroyed (both physically and in value) so the rate of profit was high. It was not scarcity of 'capital'.

Piketty reckons that only a robot society can have a return on capital never returning to zero because then there is no labour to substitute for capital. Marx

output that it will produce in the future. Both approaches require an interest rate (discount rate), but that interest rate is usually determined by using the amount of capital in relation to output. The circularity is clear. Kaldor (1975, p. 348) noted that the difficulty of isolating or measuring the change in the quantity of capital "makes it impossible to attribute to capital a marginal productivity of its own."' (Bergheim 2008, p. 28.)

45 Piketty 2014a, p. 173.

46 Piketty 2014a, p. 463.

47 Piketty 2014a, p. 466.

48 Piketty 2014a, p. 228.

49 Marx 1976, pp. 130–1.

FIGURE 4 *World rate of profit (simple mean) %*

would say that a robot economy is one where the rate of return does reach zero because there is no living labour employed to create value (not use-value)! Piketty criticises Marx's anecdotal evidence that more than half a firm's added value went in profit as ridiculous. Well, actually, studies show that the rate of surplus-value in some economies has been close to or equal to 100%.[50]

We can even check if Marx's law of the tendency of the rate of profit to fall bears out in reality over the long run. There are many studies that show just that,[51] the latest being that of Esteban Maito from Argentina.[52] Maito estimates the Marxian rate of profit in 14 countries in the long run going back to 1870, using national historical data for each country. His results show a clear downward trend in the world rate of profit, although there are periods of partial increase (Figure 4). There is a secular tendency for the rate of profit to fall under capitalism and Marx's law operates.

Maito uses Piketty's historical data for Germany to get a rate of profit for that economy. Unlike Piketty, Maito leaves out residential property and correctly categorises capital as the value of the means of production owned and

50 Maito 2014a and Moseley 1988.

51 For example, see Carchedi and Roberts 2013, which also references many other studies on p. 114.

52 Maito 2014b.

FIGURE 5 *Net rate of return on capital in Germany from 1951 to 2011* (%)

accumulated in the capitalist sector. The result is not some steady r, but a falling rate of profit *à la* Marx. There is a long-term decline, but with a rise from the 1980s to 2007.[53]

Actually, Piketty's r for Germany also falls from 1950 and then stabilises from the 1980s too (Figure 5). This is because Germans generally have a much lower ownership of residential properties. Only 44% of German households own their own homes, compared with 70–80% in Greece, Italy and Spain.

So even Piketty's r does not stay stable over a 60-year period in Germany and matches a Marxian r, when volatile residential property and financial-asset values are not in the equation.

53 See Piketty's tables for Germany; Piketty-Zucman income data set, Germany Tables DE in Piketty statistical appendix at <http://piketty.pse.ens.fr/fr/capital21c>. The graph was calculated by the author.

Piketty's Contribution

The merit of Piketty's opus is that it compiles evidence and data and tries to develop a theory and laws therefrom. He does not construct some unrealistic model of 'representative agents' and try to fit facts to it. And Piketty usually employs tendencies and countertendencies to explain the laws of the motion of capitalism. But when Piketty relies on neoclassical models and on the neoclassical definition of capital, his argument is fatally weakened.

Piketty shows compellingly that inequality of wealth and income is in the DNA of capitalism (to use that hackneyed fashionable cliché) and it is getting worse. Piketty has been criticised from the right for using tax data rather than consumer surveys to obtain his wealth figures and for not pointing out that rising inequality does not mean falling real incomes. He has firmly defended his data on inequality.[54]

Most important, he shows that the reason for the rise in the inequality of wealth is a rise of income going to capital in the form of profits, rent and interest. Inequality is not due to higher-skilled labour getting higher income than the lower-skilled. Corporate chief-executive pay comes from bonuses, share options and is really capital income.

Moreover, this rising capital share in income is a product of a rising capital/income ratio that is driven mainly by inherited wealth, not the result of entrepreneurial flair, as it was in the 'belle époque' at the turn of the nineteenth century. From rags to riches is not the story of capitalist wealth; it is more from father to son or from husband to widow. 'We are almost certainly overcounting entrepreneurs among today's super-rich and undercounting their descendants and past entrepreneurs'.[55]

Piketty's policy answer is democratic intervention through a progressive tax system, and in particular, a global wealth tax. Piketty recognises that it is utopian to expect the wealthy who control governments to agree to the reduction of their own wealth to save capitalism from future social upheaval. So it will require democratic action. But he never thinks to suggest another way to achieve such a redistribution, namely to raise wage-income share through labour struggles and to free trade unions from the shackles of labour legislation.

54 See Note 10.

55 Interview with Matthew Iglesias (Iglesias 2014).

The Gravedigger of Capitalism: Inequality or Crises?

The central unanswered question for Piketty's thesis is this: Is rising inequality the central contradiction of capitalism and thus its gravedigger? Say a global wealth tax was introduced and labour managed to turn back the rise in capital's share of income through struggle, would this more equal society mean a harmonious expansion of living standards along with an ecologically and environmentally safe planet?

Is it a tendency for a rising net return on capital (Piketty) or is it the tendency for a falling rate of profit (Marx) that is the key contradiction of capitalism in the twenty-first century? If it is the former, then all we need to do is to introduce a progressive tax system. We do not need to bury capitalism, as we can save it.

But if it is the latter, then the main contradiction in the capitalist mode of production would not be resolved. There would be recurring slumps in investment and output, huge increases in unemployment and losses in wage income and even a descent into long depressions. The solution then is one of replacing the capitalist mode of production.

Which is the right r?

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