Book Review: Capital

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Capital, by Thomas Piketty, is a book that had to be written. Both he, and his translator Arthur Goldhammer, have come together to produce a text that is insightful, interesting, challenging, and clear to the public.

I don't agree with all of the book (especially when it strays from its central thesis), have reservations about the descriptive conclusions, have strong reservations about the normative conclusion, feel that some logical conclusions were ignored for the sake of the central claim, and felt there are compelling alternative hypotheses that could explain the same data.

As an exploratory analysis of the amazing data set that Piketty, and others, have put together it was a well structured book. As an explanatory analysis, it provides a good starting point - but in truth it raises many more questions than it answers.

In section one I will summarise what I took to be the core thesis of the book. In section two I will discuss some of my concerns with assumptions in the first two parts of the book. In section three I will discuss part three of the book. In section four I will discuss part four. In section five I will briefly note some alternative hypotheses that could have been discussed for explaining the data. In section six I will give my final thoughts.

I will generally avoid small issues in the book which I disagreed with, but don't have a substantive impact on the main thesis - each of the issues I will discuss are, in my view, centrally related to either the description involved or the appropriateness of the prescriptions that are put forward.

1 Summary of book and my concerns

Piketty 2014 [17] is focused specifically on the two most aggregate factors of production: capital and labour. Capital is more than just financial wealth or plant and machinery. In this context capital includes land, and includes residential property. Fundamentally, capital is seen as "the sum of all non-human assets that can be owned and exchanged on sum market". Within this broad framework, Piketty is interested in asking what will happen to capital and labour income shares over the 21st Century, and what normative significance this has.

Although Piketty compares his analysis to that of Marx, I see more similarities to theories from Keynes with regard to income concentration in Piketty's discussion - with Piketty's concern largely about *excessive concentration in wealth and income*, and his solutions based on managing capitalism and globalisation instead of replacing it. It reminds me of the following from Keynes [11]:

> For my part I think that capitalism, wisely managed, can probably be made more efficient for attaining economic ends than any alternative system yet in sight, but that in itself it is in many ways extremely objectionable.

The key difference being that, while Marshall and Keynes believed that entrepreneurs children would run down the stock of capital they'd inherited [15], Piketty takes the opposite view that rates of return for those with large inherited capital is higher - removing a presumed force of convergence and allowing for entrenched inheritance.

The core argument about what we can expect during the Twenty-First Century can be, arguably, boiled down to the following:

1. In the long-run, the rate of growth g is given, and the savings rate s is determined primarily by social-cultural factors (and so can be seen as effectively constant).
2. g is made up of a per capita growth rate and a growth rate in population. The population growth rate is going to fall. Therefore, g will decline over the long-term.
3. With both s and g effectively given ("macrosocial" variables), and g lower in the future, the capital to output ratio (β) must rise in the long run - what Piketty terms the *Second Fundamental Law of Capitalism* (SFLC), $\beta = \frac{s}{g}$.
4. A dual argument that either i) the net return on capital r is effectively macrosocial, and can be taken as given or ii) the elasticity of substitution between labour and capital is greater than 1. With elasticity of substitution greater than 1, capital incomes share of total income will rise. This lift is due to the *First Fundamental Law of Capitalism* (FFLC) the share of income going to capital $\alpha = r\beta$, an elasticity of substitution greater than 1 implies that the decline in r (determined in the market for savings and investment) will not be enough to offset the exogenous lift in β from the SFLC.
5. Historically these four points held, however the combination of two world wars, government appropriation and regulation, and a long but transitory lift in population growth led to a decline in capital income shares.
6. Capital income is distributed more unevenly than wage income, and will continue to be following these shifts.
7. Capital income, in "excess", is less "moral" than wage income - the case for the immorality could be the change in the character of the individual/social groups, the threat to democracy involved, a social preference for egalitarianism, or a lack of opportunity/mobility.
8. A coordinated global capital tax, given the prior assumptions of fixed s, and the response of r, can reverse this - and is normatively "right" policy.

This argument is based on a large set of historical data, and Piketty's specific interpretation of it.

In parts one and two of the book, Piketty argues for why capital to output ratios will rise, and why this in turn will lead to higher factor income paid to capital owners in aggregate. A derivation of the first result can be found in [16][1], while a discussion of optimal capital tax is in [18].

[1] Although assuming constant factor shares in this case

Within this context, my concerns fall into two categories - concerns of omission, and concerns of truth[2].

Omission

1. The omission (or potentially downplaying) of the fact that taxing savings/investment will fundamentally lower output.
2. The general focus on forms of inequality, without reference to "why" or to the level of income itself - simply performing the opposite error that Piketty claims most economists make by focusing and reporting on levels/averages and not the distribution.
3. The fact a higher capital stock, and higher flows of savings per person, imply higher wages.
4. A lack of a definition of what "excessive" really means, and in what context, with relation to capital earnings.
5. A focus on the heterogeneity of returns, without asking about the heterogeneity of individuals.

Truth

1. The appropriateness of an elasticity of substitution greater than one.
2. Treating savings (and potentially the real rate of return) as an exogenous "macrosocial" variable, rather than as something that is influenced by the choices and incentives of people in the economy.
3. The use of adult personal income as a comparitor to wealth.
4. The use of adult personal income as a indication of inequality with reference to an egalitarian distribution.
5. The use of the description of historical events, namely Britain post-Napoleonic wars, post WWII, and 19th Century views on poverty, justice, and merit.
6. The strength, and form, of the value judgments around types/size of income used to justify policy recommendations.

Note: There is a side theme of growing *supermanager* salaries, and increasing marginal tax rates on high labour incomes. This is not as developed as the central capital theme, and deserves a separate discussion and analysis.

Note 2: There is a side theme on public debt, QE, and inflation. Again, I think this deserves separate discussion. Unlike the discussion of income taxes I largely agree with what Piketty says here - apart from the points where he equates QE to money printing. Some of the issues involved in this are related to the central thesis, and I will try to pick them out cleanly below.

Note 3: The review will accept all of Piketty's data as given. In the book, Piketty shows a keen understanding of the data sources, what they mean, and how they can be used. He also has a stellar reputation for accumulating and

[2]This is not to say that the assumptions may not be true, or appropriate. They are just assumptions used for analysis that I think can be strongly questioned

reporting on data. As a result, this appears to be more than a fair assumption.

With regards to the central theme, let's see if we can flesh out these ideas a little more concretely.

2 Comments on part one and two

2.1 Labour income: On what goes unsaid

Piketty is describing the long-run steady state rates of growth and accumulation in the economy, a point he makes early on. His analysis presupposes that the rate of population growth and the rate of technological growth is exogenous, and that technological growth is neutral[3], a fair assumption for his exercise.

As it is a long-term steady-state analysis, it assumes full employment, and as a result the quantity of labour is essentially fixed. But while Piketty uses this as an opportunity to discuss changes in the return to capital (r), the ratio of capital to output (β), and the share of income going to aggregate capital (α) he does not discuss the corresponding changes in the return to labour w.

This is strange. Given his assumptions, it is true that the share of total income going to labour falls. However, the fact that capitalists have increased the capital stock, for a lower rate of return, implies that the level of output is higher. Given the larger capital stock per person wages rise.

This is not just saying that the rate of return on labour (w) is relatively higher than the rate of return on capital r in Piketty's example. The actual absolute value of wages are higher, due to Piketty's forecast of a period of significant capital deepening!

Note that he obfuscates this point, by constantly referencing the low rate of increase in wages during the 18th and 19th century. However, this is a red herring. The stagnation in wages during this period was due to a mixture of market power in labour markets and the growing urbanisation of major centres. As a matter of principle, falling population growth should really imply rising absolute wages, given that the relative scarcity of labour is intensifying.

Example

We can think about this issue with reference to a constant elasticity of substitution production function with constant returns to scale. This captures much of the essence of what he is analysing[4]. Here the production function takes the form:

[3] Where technological change is Hick's neutral - such that a change in technology does not change the ratio of capital and labour

[4] Post writing this I found that he does use a CES framework to discuss this issue on page 38 of the technical appendix http://piketty.pse.ens.fr/files/capital21c/en/Piketty2014TechnicalAppendix.pdf

$$Y = [aK^{\rho} + (1-a)L^{\rho}]^{\frac{1}{\rho}} \tag{1}$$

K (the capital stock) is determined by the accumulation of capital through the savings rate, and L (labour supply) is set by utility maximising households. Asking what would happen when population growth slows in this context is akin to asking what would happen if L exogenously declined.

Rewriting in terms of the elasticity of substitution, σ we can say:

$$Y = [aK^{\frac{\sigma-1}{\sigma}} + (1-a)L^{\frac{\sigma-1}{\sigma}}]^{\frac{\sigma}{\sigma-1}} \tag{2}$$

Which implies that the marginal product of both factors is:

$$MP_L = (1-a)\left[\frac{Y}{L}\right]^{\frac{1}{\sigma}} \qquad MP_K = a\left[\frac{Y}{K}\right]^{\frac{1}{\sigma}} \tag{3}$$

Assuming competition, these marginal products give us our return to labour and capital per unit.

We know that the Piketty's assumptions have given us a smaller $\frac{Y}{K}$, as the capital to output ratio is greater.

Furthermore he tells us that, given an elasticity of substitution greater than one, capital owners will be making a greater income in this case - not just in relative terms, but also in absolute terms.

Labour incomes are a bit trickier. What happens to the absolute return depends on what happens to w. This involves solving the model with assumed closure conditions which may drive our result.

However, we can ask a relatively specific question about the model - one that we can analytically solve from here. In the current example we know that L is given exogenously, and we are thinking about a policy response that changes the stock of capital - and we are also considering a savings rule that leads to an increase in the allocation of capital. As a result, we can simply ask what the marginal effect on w will be from an increase in K, taking competition as our benchmark.

This allows us ask what happens to $\frac{w}{r}$ (the relative return to labour) from a higher $\frac{K}{Y}$ ratio, and to ask what a change in K would do to the value of w.

$$w = \frac{\partial Y}{\partial L} \tag{4}$$

$$\frac{\partial w}{\partial K} = \frac{a(1-a)[aK^{\frac{\sigma-1}{\sigma}} + (1-a)L^{\frac{\sigma-1}{\sigma}}]^{\left(\frac{2-\sigma}{\sigma-1}\right)}}{L^{\frac{1}{\sigma}}K^{\frac{1}{\sigma}}} \tag{5}$$

Given a high elasticity of substitution (of the type assumed by Piketty), namely $\sigma = 1.5$[5], this is simply:

[5]Which corresponds to $\rho = \frac{1}{3}$

$$\frac{\partial w}{\partial K} = \frac{a(1-a)[aK^{\frac{1}{3}} + (1-a)L^{\frac{1}{3}}]^{-1}}{L^{\frac{2}{3}}K^{\frac{2}{3}}} \tag{6}$$

Which is positive (given a is between zero and one and K and L are strictly positive). As a result, a larger capital stock will increase wages - and a policy response that shrinks the capital stock will reduce wages. Also, since a lift in K increases the MP_L we know that $\frac{w}{r}$ will rise in this context.

Yes, the share of income going to capital rises, but there is more capital and more output - so even though the *labour share* falls, the increase in capital per person due to the high relative accumulation rate will by definition push up the *return to labour*!

Note: This is a basic illustrative example. Yes competition does not hold, and this would change the ratio of $\frac{w}{r}$ that occurs in the very long run. Yes, people are not fully rational, and the short-term adjustment paths will not look like this - something Piketty is at pains to point out when discussing the SFLC. But even within more complicated cases, this same tendency exists - the point of the example is just to highlight the full set of logical conclusions that come out of running through this exercise, in terms of the tendency of the economic system. It would be churlish to reject the conclusion of higher wages and hold to the conclusions Piketty gives - given they are stemming from the same central logic.

This is an old result. Solving the model in the case with an elasticity of substitution of 2 Solow 1956 [23][6] states with regards to population growth[7]: specifically:

> Here we see that in equilibrium growth the relative share of labor is the greater the greater the rate of increase of the labor force and the smaller the propensity to save.

Here Piketty is essentially instead asking 'what happens when the rate of increase in labour labour force slows'.

Now you may criticise the way I am framing this on the basis of later comments by Piketty, namely from page 373-374:

> It is important to note that the effect of the tax on capital income is not to reduce the total accumulation of wealth but to modify the structure of the wealth distribution over the long-run.

But this appears to presume that the capital stock is determined without reference to the rate of return on capital, a bold claim, and one that is a lot stronger than the claim that the elasticity of substitution between labour and capital is greater than one.

[6] Piketty touches on this paper briefly on page 11, where he appears to be downplaying the usefulness of the "balanced growth path" approach. However, I find this a bit strange, given this is an essential part of the description he uses when framing his own model

[7] There is further discussion on relative factor shares found in [3].

Why is this such a strong assumption? At face value the issue appears to be treating capital as an immovable chunk we can tax - essentially assuming that the price elasticity is zero. This is a massive assumption. Here we have a case where it is assumed the rate of return does not impact upon the accumulation of, or stock of, capital. However, this is not to say that the change in the stock of capital has no impact on the rate of return - and when Piketty says that the capital income share moves around less than the capital to output ratio he is specifically pointing out that the rate of return on capital is expected to fall. The purpose of the tax is to make it fall further. Simply assuming that it will not reduce the capital stock at this point is overtly optimistic, and akin to directly assuming that only redistribution matters.

2.1.1 With regards to the paper

In [16], a Cobb-Douglas production function is used and as a result the elasticity of substitution is set to one - and the factor incomes for capital and labour are constant.

His concern in this paper is instead that the issue of inheritance has been masked by a period of rapid population growth. Given the assumption that some inheritance is by mistake, or due to individuals accumulating wealth over their lifetime but not valuing it as an inheritance, [18] stating that we can tax this inheritance without hurting growth.

The debate about the equity impact of taxing inheritance is one that relies on views about equality of opportunity, and measurement of the actual change in behaviour due to inheritance taxes. But this shouldn't be confused to general capital taxation, and the concept that, since capital and labour coordinate to produce goods, taxing capital can end up just hurting labour[8]. As Piketty likes to say 'we will come back to this later'.

2.2 On assumptions

The above discussion of labour income took as given the assumptions made by Piketty. However, it is also useful to consider what assumptions his result relies upon and whether they are reasonable.

The chain of logic goes as follows:

- With a given savings rate (in this case net of depreciation) and growth rate, we can define the long-run ratio of capital to output.
- With a known change in the long-run ratio of capital to output, and a given elasticity of substitution between labour and capital, we can define the change in the long-run share of income accruing to capital.

As Piketty states, these are both trivially true. But in utilising these results, there are a couple of issues of concern: the elasticity of substitution between

[8]This is the fact that $\frac{\partial w}{\partial K} > 0$, or that a higher level of capital increases the marginal product/return to labour

labour and capital that has been used, and the implied behaviour around savings/capital accumulation.

2.2.1 An elasticity of substitution greater than one

The preceding discussion accepted the assumption that the elasticity of substitution (EOS) greater than one was valid. However, Piketty's claim that (page 221):

> On the basis of historical data, one can estimate an elasticity between 1.3 and 1.6

The justification for this is stated to be [19]. However, this paper merely notes that the data might be consistent with an EOS > 1.

When it comes to estimating the EOS, at least in terms of gross factors, the literature tends to point towards EOS < 1[9].

However, the literature is likely to be wildly inappropriate for estimating what Piketty is looking for. He is generally interested in net factors, rather than gross factors. Furthermore, his definition of the capital stock has been made to be as general as possible. In that context, it is intuitively unclear to me what the EOS should be.

We may be able to justify a rising EOS if we believe that technological change will increase the level of substitutability between labour and capital - this is an potential outcome I would not rule out, and one that may in turn justify a tax on capital. However, this is not the basis for Piketty's claims, and is certainly not the sort of change he appears to be discussing.

2.2.2 Capital markets, savings choice, deferred consumption

The savings rate is a net savings rate as he states on page 178. As a result, it is not independent of the stock of capital. Namely, as the capital stock increases (relative to output) a given depreciation rate will take up more of national income. As a result, gross savings must rise!

This may, on the face of it, seem like a niggely criticism. But it is symptomatic of the type of principles that seem to be missing if we just treat savings as "exogenous".

Much is made of the average return on investment in Capital. However, another key driving force of what is going on is the lack of behaviour with regards to savings. It may be true that savings rates will remain unchanged going forward, however to make sense of it and to normatively value what is going on we need to apply a reason why savings behaviour does what it does.

Generally, saving is viewed as deferred consumption. In that context, building up a larger stock of savings (sacrificing consumption now) appears strange unless we are going to consume it (including the return on savings) in the future.

[9] eg [26] for New Zealand, and [20] for the US - although the Spanish result is greater than 1

Furthermore, a market for borrowing and lending this savings should exist, and involve a price (the interest rate) which adjusts to this new savings reality.

Why is savings/capital accumulation not being affected by the net rate of return? What exactly occurred in historic evidence that makes this type of assumption palatable. Piketty notes that there are other reasons for saving (eg power accumulation, value of having wealth), and gives two key historic stories he uses to justify this assumption: British government debt during and after the Napoleonic wars and the post-WWII experience of higher rates of return with low levels of capital.

The Napoleonic story was as follows: During the war the British government required funds. It sold bonds on the open market that paid a 5% real interest rate in order to get hold of these funds. Wealthy Brits saw this as an attractive return, so they cut consumption and lent the funds - they both continued to invest while buying up public debt, further increasing their private capital stock. Under this view, the wealthy seem to hoover up investment opportunities with the target of increasing their dynastic wealth.

The discussion of government debt and wealth during and following the Napoleonic wars troubled me. Yes we did see wealth households lend to the government and continue investing - as they in turn cut back consumption. Essentially though, as Piketty notes, this was due to the government offering a very high rate of return on government bonds, increasing the private reward associated with delaying consumption.

This functioned as a wealth transfer to the upper classes from the British government. The issue here was not the existence of debt, or the schedule of returns on private investment that capitalists were responding to - but a public choice failure. The solution to this type of failure is for government not to do it in the future, rather than it being indicative of the sheer willingness for private investors to blindly increase their savings rates (which is the inference given in the piece).

The post-WWII story was part of the larger narrative about the two world wars. The World Wars (and to some extent the Great Depression) saw private wealth get destroyed. However, it was mostly a drop in the value of private wealth, rather than physical destruction, that led to this shift.

At first glance this seems very strange - rates of return were historically high, but the value of capital/wealth was historically low. Piketty notes that this was largely the result of policy - government regulation and direct confiscation of land and capital lead to a drop in the value of wealth.

Now to me this screams policy induced risk. The value of capital was low as the risk adjusted return was low, due to the fact that people genuinely feared they would have their capital taken off them. This type of narrative isn't one of an egalitarian society giving people opportunity - it is one of a world filled with fear and risk. The high rates of return in this context are to compensate for the fact the individual is taking on significant risk.

Neither of these two narratives tell us much at all about the fundamental nature of capitalism - in truth it is easy to read both as the result of government choice.

One thing I would say is that the existence of "too big to fail" implicit subsidies fit into the narrative of Napoleonic Britain, and may help to explain the lower observed rates of return. In this case, we might be able to argue that these shifts in capital ratios and observed rates of return are a function of the implicit tax or subsidy government actions place on capital owners. But this is not the story I read here.

Note: This is also where it is worthwhile discussing the Cambridge Controversy, which he rules out as relevant at the end of chapter 6 (pages 230-232). I like his summary, and in some I agree with him. But when we move on to discussing policy, and discussing the valuation of capital the concerns raised by Sraffa 1960 [24] (and discussed by in [14]) are extremely pertinent. The inability to *add up* diverse capital is a severe critique of aggregation - and is a strong critique of basing analysis so strongly off raw factor shares. However, I do not aim to go into detail on this - as many of the mainstream critiques of Piketty's thesis will be subject to the same criticism. In truth, it merely states that all sides need to look at a wider set of evidence, specifically in terms of groupings/types based on other types of characteristics.

2.3 Points to consider on parts one and two

This discussion leads us with several points that need consideration with regards to the description in the first half of Capital, and what to consider through the rest of the book:

1. In a world of slower growth, can we really expect the savings/investment rate to stay at these levels.
2. In a world of slower growth, and elevated savings, is it really consistent for the average return on capital to only adjust as far as Piketty is suggesting? What about in risk adjusted terms?
3. In this world, is the stock of capital really independent of the return on capital - or more specifically, how responsive is investment (and the ultimate capital stock) to changes in the rate of return?
4. In a world with slower growth, elevated savings, and a sizable return on capital, what role does government action have to play? Is this a result of the *natural tendency of capitalism* as Piketty states? Or is this really a story of government protecting wealth, and "socialisation of losses"?
5. In this world of rising wages, but with a class of people living off capital income, what normative principles will matter for our analysis - what layer of value judgments do we need to add to say this is a process we want to avoid.

3 Comments on Part three

3.1 The tyranny of aggregation

An underlying assumption of note here is the *tyranny of aggregation* when it comes to trying to discuss the relationship between historic and future data. Aggregation, and narrative around aggregate *types*, is both a blessing and a curse for analysis - and is something that we need to be more acutely aware of when thinking about how we can use data.

Piketty's analyses income distribution in a functional (macro) sense, and in a personal (micro) sense, in this book. However, the narrative and conclusions are primarily focused on the functional definition of income through income sources - capital and labour. As Atkinson and Bourguignon 2000 [4] note, in the time of Ricardo it seemed natural to assume there was a direct relationship between the functional and personal income distributions. However, in modern times it is not so clear, as income sources are more dispersed and income inequality "within" types of factor income have become more important.

Piketty, rightly, realises this, and spends most of section three trying to justify the link between functional and personal income distributions by discussing static personal income flows and stocks of wealth and relating that to the stylized fact of changing capital-output ratios and capital income shares that was discussed in parts one and two.

Essentially, part three is attempting to relate the stylized "types" of capital and labour to more disaggregated "types" of the personal income distribution - namely centiles and deciles.

This raises several areas we have to be aware of when trying to understand the historical data and its relation to the future:

1. What is our unit of analysis (eg individual, household, family, dynasty)? How does this unit of analysis help to describe the data? How does it relate to equity/fairness principles we may be discussing.
2. How do we deal with time horizons with our use of stocks and flows (eg for how long is our unit of analysis experiencing that flow during their lifecycle)? Are our comparisons of stocks and flows appropriate?

Even once we have this, if we want to think about policy, we need to then understand how behaviour changes and how the heterogeneity of agents influences this [13]. However, that is an issue for the next section.

3.2 The unit of analysis and inequality data

Although Piketty has made the data available for his analysis, I have run into errors whenever I've tried to download it. In this context, I am having to hazard a guess at what the data is based on the technical appendix pg43. Via this, it appears that the income distributions used are individual adult incomes.

This is a peculiar unit of analysis for incomes for a number of reasons:

1. Individual incomes tend to be much more dispersed than household/family incomes due to "labour sharing" in the household and the corresponding "economies of scale" for people living together.
2. Asset ownership (which is the key comparison) doesn't make much sense on an individual level.

In this context, a focus on the individual (instead of who has a functional claim on income resources) will exaggerate income inequality - pure and simple.

An additional point comes up when we consider Piketty's view of bequests and asset allocation. He talks a lot about a select group owning assets, assets they can pass on. However, by definition that implies that the value of the asset is split between the consumption value of the group who is currently holding it and the implied consumption value (from the asset) of the currently living group who will get access to it later on. If we take this into account, capital incomes over a lifecycle would be significantly more diverse!

One way to think about this is as follows. Your parents may own a house while you don't. In the data they hold this asset, however when they pass on they are likely to give you the property - not in all cases, but in many cases. As a result, both you and your parents are assets holders!

Now this is a difficult thing to estimate, as the data does not tend to include these types of links. However, it is an issue that we have to keep in mind when looking at the distribution of capital income - lifecycle elements are extremely important.

3.2.1 Deciles and prices

One additional point that needs to be mentioned is that the comparability of income declines through time doesn't necessarily make sense, when the relative price of the *basket of goods* of different deciles changes.

This is important for two reasons. On the one hand, if prices are, say, rising more quickly for higher deciles, and increase in income dispersion may not imply an increase in the inequality of people's claim on resources!

However, the lift in relative prices for goods predominantly purchased by higher deciles (especially some forms of status goods) could give us a indication of growing segregation in society and power between groups.

Piketty touches on this point when he discusses cross-country comparisons, but it is an important issue that deserves more investigation at the within country level.

3.3 Time horizons, stocks, and flows

If found myself specifically concerned about the comparison of inheritance wealth figures with the average income of the bottom 50% of the static income distribution. As Piketty notes on page 420, the figure he uses is equivalent to a lifetime on the minimum wage - a number that would be well below what the average of the bottom 50% of individuals earn over their lifecycle given what we know about the makeup of minimum wage employment[10]

Adding this to our earlier point on the unit of analysis and lifetime income effects, when it comes to capital income Piketty claims on pg 258 that capital income inequality is similar by age[11] (ruling out lifecycle effects). However, by page 405 we are being told that the stock of capital (with reference to a 50 year old) rises with age - instead of the "U" shape we may expect from income smoothing. Although these two facts could be consistent, they still do imply that lifecycle effects matter when doing these comparisons.

There are two things we need to keep in mind, with regards to ways that the inheritance wealth result is being exaggerated in Chapter 11.

1. The comparison with essentially the "minimum wage" does not provide a lifecycle vs lifecycle comparison of labour income to capital income - in fact it explicitly understates labour income.
2. The figures from capital "by age" do not take into account the fact that, as you get older, the probability you have inherited wealth rises!

3.4 Some early value judgments

There were a few quotes which, at this point, I felt were inappropriate. Furthermore they are views that help to drive the policy recommendations later on - so it is important to note them down here.

On page 416 Piketty states:

> Modern meritocratic society, especially in the United States, is much hard on losers [than nineteenth century society], because it seeks to justify domination on the grounds of justice, virtue, and merit

This is an astonishing claim. Although the argument that society may propergate injustice by pretending that luck is skill is a fair one, the claim about the nineteenth century does not bear scrutiny. As Ravallion 2013 [21] notes that we have gone from viewing issues such as poverty as a *social good* to now viewing them as a *social bad*.

Or moving towards Piketty's favoured medium of novelists, take the example of Oscar Wilde's The Picture of Dorian Gray [28], which was published in 1890. Written by a self avowed socialist[12], the book describes a situation where a beautiful, but simple, young man has a picture drawn of himself. His flawless beauty is taken by him, and those around him, as a sign of virtue. However, this picture captures the signs of avarice and mischief that would otherwise adorn his face - leaving him to look young and virtuous while he committed sin. The jarring of emotions in the book comes not from his unspeakable acts, but that

[10] Eg [1]

[11] At this point we are referred to the technical appendix, but as I can't get the excel sheets to open I could not verify this

[12] Oscar Wilde's "The Soul of Man under socialism" [27] - which is in a large part about having the state help to allow individuals grow, by pressing against the perceived injustice of the free market

that the beauty that was supposed to symbolise virtue had been manipulated - beauty, and his class status, was seen as a form of merit rather than the result of luck.

The fact that the claim that our external beauty represents our internal morality seems ridiculous in modern days, with beauty seen much more directly as a form of luck. As a result, along this dimension, we seem to have a fairer view of true merit than our earlier counterparts!

Then there is this from 443-444:

> The inequality $r > g$, combined with the inequality of returns on capital as a function of initial wealth, can lead to excessive and lasting concentration of capital: no matter how justified inequalities of wealth may be initially. ... A person who has good ideas at the age of forty will not necessarily still be having them at the age of ninety, nor are his children sure to have any. Yet his wealth remains.

These are strong normative judgments. Let us remember a few things here, the return on this initial capital is part of the incentive for deferring savings/taking risk initially. Furthermore, someone at the age of forty would like to save for their retirement, or to give a nest egg to their children - them having lower marginal product when they are old, or their children being less productive, does not change this incentive nor its appropriateness per se.

There is a nugget of truth in this, namely that when it comes to bequests there are three elements: a bequest you give accidentally, a bequest you give because you care about your children, and a bequest you give because you just enjoying having wealth. The impact of a capital tax on people's choices differs in all three cases, and the impact on social welfare also differs.

But it is a sizable step from this to essentially suggesting that bequests (including to your future self it seems) are inherently immoral. There is a tacit assumption here that only income that comes from supplying labour, within a near enough timeframe, has the appropriate moral content - this is an astonishingly strong assumption, and certainly not one I'd be willing to base policy (which is likely to also lower wages, but reduce inequality) on.

3.4.1 Heterogeneity

This raises an additional important point which will come up later - heterogeneity. Piketty is willing to use the heterogeneity of returns to agents, but seems to a prori take these differing returns as something that is *bad*.

However, this is not clear. Fundamentally, we may have a situation where differing returns may be viewed by society as a *good* thing in two ways:

1. The individuals/households involved are different, and value things in different ways (differing needs/desires).
2. The individuals/households involved are different, and have a differing ability to transform factors into returns.

3. The individuals/household involved are exactly the same except for their starting endowment, and imperfection in credit markets [5]

This is not a given, but it needs to be taken account when looking at the distribution of income. These fundamentally important issues when it comes to considering policy.

4 On Part four

Having discussed the description of the phenomenon in the first three parts of the text, Piketty is ready to move onto policy conclusion in part four. His main recommendations are:

1. Higher effective marginal tax rates on high labour incomes.
2. A global capital tax, on the stock of capital/wealth.

With regards to a capital tax, there is a very important theme that may get lost by those who may have an ideological bent against it. Piketty is suggesting the capital tax as a *broad-based* measure that does not require picking winners, or controlling people's actions/expenditure directly. Part of the reason why Piketty is so keen on a capital take is because he believes it allows many of the benefits that exist within capitalism (competition, people's ability to make choices that represent their preferences) to be maintained, while dealing with a negative tendency he believes exists in society at large.

4.1 On ideal taxation

As noted earlier on, the discussion of labour taxes and labour income distribution is really a side-thread of the book. Chapter 14's discussion of progressive taxes is not solely about labour, and does not provide enough meat to get to the issue. When it comes to considering this specific issue, I would note that Piketty's view is driven by [7]. However [12] note how fragile this result is to heterogeneity in individuals preferences for consumption vs leisure - a major issue. Furthermore, the fact that such a tax is explicitly justified on the basis of confiscation is not a small moral judgment to make! Finally, his discussion of education without reiterating the Tinbergen/Godin and Katz [8] education vs technology thesis as an appropriate counterfactual gave a bit misleading view of the role of education in improving opportunities.

As a result, we will leave this to the side. The key tax of interest is a tax on the stock of global capital.

The justification for such a tax is based on two principles:

1. **The Contributive principle**: For large wealth the return on capital creates retained earnings which are not taxed. As a means of contributing to society they should be.

2. **The Incentive principle**: The taxation of capital forces people who are accepting low rates of return to sell assets to those who can make a large economic rate of return.

I find myself troubled by both principles. The contributive principle needs to be clearer about what it means by contributing - yes retained earning will increase savings and have not been taxed, but in what way are we trying to get individuals to contribute? Under what ethical priviso? The incentive principle makes me a lot more uncomfortable - the economic return of an asset or good is not the entire value of it, if an individual is holding it and making a low rate of economic return it is because they get private value from doing so. Taxing with the aim of forcing them to transact to sacrifice this smacks of injustice.

A more general piece of the discussion that is missing here is the idea that a tax on capital income is a form of *double taxation*. Now Piketty disagrees with this, given his view on how we should view income, however given how often this argument is used it is worth considering.

When discussing the appropriate type of income to view for tax purposes, Piketty states on pg 497 that:

> If individuals were classified by centile of total resources accrued over a lifetime (including both earned income and capitalized inheritance), which is a more satisfactory criterion for progressive taxation

Specifically, Piketty in interested in people contributing on the basis of their lifetime wealth specifically - not on the basis of the contribution over their dynasty. The difference lies in the fact that the capitalized inheritance income is the result of savings (and the return on savings) made from labour income from earlier generations. If the tax system had been unchanged the entire time, this initial labour income had already been taxed - and the capital income that accrued can be seen as the savings/deferred consumption of the entire dynasty.

There is a specific moral judgment here that labour income that is saved *should* be taxed again. It is important to make that clear.

Now the issue of capital income taxes given a view of dynasties has lead to a significant literature in the past. Chamley [6], Judd [10], and Atkinson-Stiglitz, illustrated that, given a certain set of assumptions a tax on capital income/capital was not a good idea - due to the fact it lowered capital accumulation (and thereby output) and involved taxing future consumption more than current consumption. In the short-run a capital tax may seem appropriate in this context, but by negatively impacting upon accumulation the existence of a tax on capital (or expected tax on capital) is inefficient.

Both Piketty and Saez and Diamond and Saez these representative agent type models, with the first paper pointing to specific issues (credit constraints, different dynastic motives) that make having a capital tax second best. Saez discussed how those with higher-ability are likely to have higher savings rates (preference heterogeneity), therefore a tax on capital satisfied the core tax principle of each according to his ability to each according to his need. Golosov et al. also found that capital income taxes were justified given measured levels of preference heterogeneity, but they were relatively small compared with general income tax rates.

In this environment, there is still an open debate as to whether current capital income taxes are too high or too low, according to principles of redistribution based on ability.

The issue Piketty is raising here is separate. Although the varying savings rates do make up part of his discussion, there is a specific focus at the dynastic motive of capital accumulation, and underlying principles of fairness of income from inheritance - income that is *unearned*. As a result, the capital stock tax he is considering is not simply the result of appeals to optimal tax literature (which we have briefly outlined above), but relies on a specific view of rights and opportunity for an individuals lifecycle.

Within this capital tax, Piketty is careful not to use unearned much of the time, and to avoid his argument as being akin to arguments about taxing unearned or unproductive income. He notes from the start that earning income from a housing asset is not unproductive - there is a housing service being provided. However, his policy judgments relate on a tacit view of whether income from certain sources is in fact fair, and the morality of those faced with different income choices - in chapter seven (pg 240) he makes this clear in the face of significant inheritance:

> Under such conditions, why work? And why behave morally at all? Since social inequality was in itself immoral and unjustified, why not be thoroughly immoral and appropriate capital by whatever means are available?

His moral description of behaviour, and the assumption that a capital tax would change it, is a central part of his thesis. And can certainly be disputed.

4.2 Rights base and equality of opportunity

However, when it comes to discussing an *ideal* tax it is important that we are clear on the moral basis we are justifying for using that. Nearly all economists would state that they believe in *equality of opportunity* - but exactly what this entails, and what unit of analysis this opportunity is defined over, are left unclear. It is in this basis where there can be considerable disagreement between economists with regards to ideal policy!

This is unsurprising, we cannot make a normative judgment about what policy is "best" without including certain ethical/moral judgments in our analysis. The key point is that these ethical statements are clear.

In discussing this in Chapter 13, Piketty states on pg 480 that:

> social inequalities are acceptable only if they are in the interest of all and in particular of the most disadvantaged social groups

This raises two distinct points:

1. Do we believe social inequalities are only admissible if the existence of the inequality creates a situation that benefits all (Pareto optimality) - namely, is this an appropriate "starting position" to judge policy from.
2. When discussing policy, have we articulated trade-offs appropriately enough to work out what this position is.

In this context, even if we were to accept Piketty's moral judgment here, social inequalities in capital levels, even with people who are otherwise exactly the same, can be Pareto Superior [5]! This is a powerful result, and reinforces the need for both a clear description of the trade-offs and a clear moral base on what *equality of opportunity* really means to justify policy. Piketty should be congratulated for raising these points in a relatively transparent manner - but what it really implies is that now is the time for debate and clarity on them.

My key guess is that the argument is as follows: we provide social education and health to give kids the same start, perhaps we should do the same with the level of inheritance. If this is the argument, then we can discuss the efficacy of trying to prevent parents giving their kids a hand up, and whether that is something we are socially comfortable with. If this is not the argument, then I am unclear on why this matters! Either way, there is a moral principle here that needs to be clarified and made explicit.

4.3 Democracy and the legitimacy of redistribution

Piketty takes the argument that the level of redistribution should be determined by democratic mandate. There is undeniable truth to this, and as an ideal this is virtually unarguable in modern society. However, it is important to be aware of the limits of social choice for ranking preferences among individuals.

Ever since Arrow's impossibility theorem [2] came to light, the ability for have a communal/social ranking of more than two alternatives, based on voting, to represent the underlying ranking of individuals has been questionable. In this context, we have to be careful moving from the data we receive from a voting process to statements about the desirability of the favoured choice according to that process!

Furthermore, let us consider *individual desire* for redistribution relative to both the existence of an *impartial observer* or the choice of individuals behind a *veil of ignorance*. In the later two cases, neither the creation of income or its process of allocation has been determined, and people will state what they think is fair on the basis of true equality of opportunity[13]. However, in the first case we are looking at a situation where production has occurred, and capital has been built up, and we are simply asking individuals whether they think it is fair if some of it is reallocated. Even if we could aggregate up individual preferences into social preferences, the timing of the action involved in the democratic vote has a real impact - in many ways the force of government may be viewed as extractive. This is one of the key insights that leads us towards concepts such as Directors Law [25].

[13]Along with an aversion to risk, or other principles of fairness

I have little more to add on this, however if we are going to justify the extent on redistribution on the basis of democratic mandates the issues involved with social choice do need to be considered.

5 Alternative hypotheses

Given the assumptions mentioned in the above sections, it should be clear that we can't let the data speak without reference to some theory/model. In this case, the data Piketty has painstakingly collected can give us a different narrative if we expose it to different assumptions:

1. The shifts in capital's share is largely down to technological change - so virtually unforecastable.
2. The shifts in capital's share is largely down to changes in the "risk premium" - so largely due to government action.
3. The shifts in capital's share is largely down to changes in the demographic profile of the population - so transitory, and likely to peak soon.
4. The shifts in capital's share is largely down to changes in measurement/reporting of assets/asset prices - so both transitory, and a false picture of reality.

And of course, these varying narrative change the policy prescriptions fairly sizably.

Now it is possible that Piketty has dealt with these alternate hypotheses in the past. Within the book he does touch on the Goldin Katz [8] hypothesis, and states that he believes it misses certain key elements of what is going on.

However, given the uncertainty I noted about many of the assumptions being used for Piketty's discussion (the elasticity of substitution, the response of investment to changing rates of return, the normative assumptions around the outcome of said process), I would like to see a more general discussion on the contribution of different factors to the change in the observed distribution of factor income. Before this takes place, any policy conclusions are uncompelling.

6 Closing notes

I realise this reads as a critical review, but this is not because I thought poorly of the book - far from it. Instead Capital offered a unique analysis of an amazing data set, an analysis that I thought was worth discussing in detail. It reads like economic texts from an earlier time, and I really enjoyed that aspect.

There are, unsurprisingly, a large number of unanswered questions in all of this. An investigation into both the descriptive nature of the data and the moral principles that give policy aims meaning will add a lot to our understanding of tax policy, and of the way we function as a society.

I am extremely glad to see a book that, with its existence, points out that a blind march towards greater capital accumulation isn't a certain good. At times, the types of policy questions we ask and answer can be filled with a tacit judgment that all that matters is the average or total of some variance (such as income), with considering winners and losers more completely.

However, I am also uncomfortable with the idea that some may follow the policy recommendations in this book as gospel. It is far from clear whether the policies are appropriate - either in terms of the moral principles we hold, or the actual description of what has been going on in society. In fact, in large sections of this book I felt Piketty was simply making the same error as the analysts he bemoans - with a sole focus on one factor (the distribution of income) without reference to another (the level of income), and without a clear pointer to what the *moral* conterfactual is believed to be.

It was not a book focused on articulating or showing the trade-offs associated with the policies being put forward. Pushing for policy action without a clear idea of the trade-offs, and with partially formed moral judgments, is the surest way for a society to inadvertently propagate injustice - after all, the road to hell is paved with good intentions. In this context, the text should be seen as a call to debate, rather than a push for immediate action.

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