

BACKGROUND

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Understanding Thomas Piketty and His Critics

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Abstract

Thomas Piketty's Capital in the Twenty-First Century is a treatise on how wealth inequality evolves in capitalistic economies. Piketty uses data stretching back to the 18th century to describe the historical evolution of wealth and inequality, proposes a model that matches the data, and uses that model to predict rising wealth inequality in the 21st century. He recommends punitive taxes on high incomes and wealth to prevent the scenario that he predicts. However, the best critiques of Piketty have shown that most of the links in his argument are broken. Piketty's model does not match his data as well as he claims. His prediction of permanently rising wealth inequality rests on two implausible modeling assumptions. And his recommendation of punitive taxes is based on the glib assumption that capital accumulation is unimportant for wage growth, an assumption at odds with the data and even with his own model. As a result, almost nothing in Capital in the Twenty-First Century can be applied usefully to policymaking.

Thomas Piketty's *Capital in the Twenty-First Century*¹ is a treatise on how wealth inequality evolves in capitalistic economies. It is the most talked-about and most critiqued economics book of 2014 because Piketty's timing was perfect: He released the English edition when income inequality was being actively debated in the United States. President Barack Obama brought the issue to the forefront in December 2011 in a high-profile speech in Osawatomie, Kansas.² It has remained an issue in campaigns and policy debates ever since and promises to remain so through the 2016 election.³

Piketty uses data stretching back to the 18th century to describe the historical evolution of wealth and inequality. He proposes a

KEY POINTS

- Piketty's work consists of historical data, predictions of high future inequality, and a prescription of high taxes on wealth and income.
- Piketty's historical data are interesting, but do not reveal a universal tendency toward wealth concentration—contrary to his conclusion. He also ignores major swings in the price of housing, which now accounts for half of all wealth.
- Piketty's prediction of rising wealth inequality relies on two assumptions that other economists have sharply criticized as implausible. After correcting his model and accounting for the evolving price of housing, Piketty's predictions evaporate.
- If governments enacted high-income tax rates and punitive wealth taxes as Piketty suggests, their economies would shrink severely. Inequality would fall, but everyone would become significantly poorer.
- *Capital in the Twenty-First Century* is not a useful guide to policymaking. Instead of focusing on inequality, Congress should pursue policies aimed at allowing all incomes to rise.

This paper, in its entirety, can be found at <http://report.heritage.org/bg2954>

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model that matches the data and uses that model to predict rising wealth inequality in the 21st century. He recommends punitive taxes on high incomes and wealth to prevent this scenario.

However, the best critiques of Piketty have shown that most of the links in his argument are broken. Piketty's model does not match his data as well as he claims. His model has two implausible assumptions that, when corrected, eliminate his prediction of permanently rising wealth and wealth inequality. His recommendation of punitive taxes is based on the glib assumption that capital accumulation is unimportant for wage growth, an assumption at odds with the data and even with his own model.

While economists rightly applaud Piketty for making his data available and subjecting his ideas to public criticism, almost nothing in *Capital in the Twenty-First Century* can be usefully applied to policymaking.

Readers are left with the clear impression that the specter of rising wealth inequality haunts Piketty. Oddly, he never makes a sustained effort to explain why rising wealth inequality would be harmful in a modern economy. His stated reason for his concern with wealth inequality is that he believes when it reaches some level, democracy devolves into plutocracy—rule by the rich. He offers no evidence, however, that rising wealth or rising inequality has been associated with the demise of democracies.

Despite his mistakes, many in favor of higher taxes will continue to use Piketty's arguments or appeal to him as an authority. Policymakers need to understand Piketty's argument and understand where it breaks down to refute those arguments and offer policy proposals that may actually increase living standards and opportunity.

Piketty's Argument

In *Capital*, Piketty presents historical data, explains the data with a model, projects the model into the future, and proposes high taxes to forfend

his own predictions. These parts of his argument are interleaved with each other throughout the tome and illustrated with scenes from old books—hence, the translated tome's surprising readability.⁴

Piketty uses the word “capital” to describe all forms of wealth.⁵ This paper uses the word “wealth” because it better communicates the concept and is not as ambiguous.

Piketty's central concern is wealth inequality, which he defines as a high concentration of wealth in a relatively small number of families. By contrast, the inequality debate in the U.S. has centered on income inequality. When Piketty writes about income inequality, he usually defines it as the share of national income earned by the top 1 percent or top 10 percent of earners. Both types of inequality can be measured in various ways, so comparisons between studies should be made with careful attention to definitions.

In this section, we present the core argument of *Capital* with a minimum of criticism.

Historical Data. Piketty's data compilation is the result of years of work with a team of colleagues, using tax files, probate records, surveys, and other creative efforts. Perhaps Piketty's greatest contribution was to prod governments to turn over old files that had never before been used in research. The underlying data, some of which contains information that must be protected for privacy reasons, have not been made public, but Piketty and his team have made their aggregate statistics available and explained most of the tweaks made to the data.

Piketty's focus is on income distribution and wealth data stretching back as far as the 18th century for several countries. Historical data by nature are imprecise at best and often nonexistent. In some cases, Piketty interpolates missing data. For example, Piketty uses the wealth share of the top 1 percent in the U.S. to estimate the wealth share of the top 10 percent for the decades 1910–1950.

Three Metrics, Three Eras, Three Countries. Piketty focused most on three macroeconomic met-

1. Thomas Piketty, *Capital in the Twenty-First Century* (Cambridge, MA: Belknap Press of Harvard University, 2014).

2. Barack Obama, “Remarks by the President on the Economy in Osawatomie, Kansas,” The White House, December 6, 2011, <http://www.whitehouse.gov/the-press-office/2011/12/06/remarks-president-economy-osawatomie-kansas> (accessed August 7, 2014).

3. For instance, the Center for American Progress launched the Washington Center for Equitable Growth, a new organization devoted solely to the study of inequality. See Washington Center for Equitable Growth, <http://equitablegrowth.org/> (accessed August 25, 2014).

4. Arthur Goldhammer deserves praise for his excellent translation from the French. The book's readability and hence popularity are in no small part due to his skill.

5. Piketty, *Capital in the Twenty-First Century*, p. 46.

rics: the wealth-to-income ratio, income inequality, and wealth inequality. His data come from several countries, but the data are most complete for France, the U.S., and the U.K.

In the first era, from the earliest data until the outbreak of World War I, the wealth-to-income ratio remained steady at a very high level in Europe. The stable wealth-to-income ratio masked an epochal shift in its composition: Agricultural land was king in 1700 and a pensioner by 1900. Wealth ownership was concentrated. In 1870, the top 10 percent of owners possessed 70 percent to 90 percent of national wealth, depending on the country.⁶ Most displeasing to Piketty is that inherited wealth was particularly important, so that birth and marriage were the surest paths to riches.

During the second era, from World War I through the Great Depression and World War II, the wealth-to-income ratio fell rapidly. Income inequality shrank as well, especially during World War II.

Certainly the wars played a part in reducing wealth by physical destruction, but Piketty points to economic crisis and regulatory policies as a greater culprit in the decline of wealth:

[The] budgetary and political shocks of two world wars proved far more destructive of capital than combat itself. In addition to physical destruction, the main factors that explain the dizzying fall in the capital/income ratio between 1913 and 1950 were on the one hand the collapse of foreign portfolios and the very low savings rate characteristic of the time (together, these two factors, plus the physical destruction, explain two-thirds to three-quarters of the drop) and on the other the low asset prices that obtained in the new postwar political context of mixed ownership and regulation (which accounted for one-quarter to one-third the drop).⁷

Piketty sees the low market value of postwar wealth as “a positive thing” because government deliberately chose to devalue assets and therefore diminish the wealth of their owners.⁸ Although the U.S. came through both world wars physically unscathed, economic policy and the Great Depression devalued wealth as much in the U.S. as in France and the U.K.

The third era emerged after 1950. The old money had been destroyed by “bombardment, expropriation, or bankruptcy.... The war reset all counters to zero ... and inevitably resulted in a rejuvenation of wealth.”⁹ The immediate postwar decades were characterized by low inequality, rapid growth, high employment, and a burst of fertility. Piketty rebukes nostalgia for the mid-century moment—an “enchanted world” that will not recur,¹⁰ but he wants to prevent a full adjustment back to the bad old days of inherited wealth and high wealth-to-income ratios.

The world of the third era, the one since 1950, is between extremes. Income inequality has risen in the U.S. and Britain, but hardly at all in Continental Europe.¹¹ Wealth-to-income ratios have risen considerably in Europe, but not much in the U.S.¹² Wealth inequality has risen slightly in most countries, but remains far below traditional European levels.¹³

A Model of the Past. Piketty employs a slightly modified version of the neoclassical Solow Growth Model to tie the broad global changes together. The Solow model’s key feature is that capital and labor combine to create output. All the income in the economy goes to either capital or labor. Piketty’s odd jargon choice—using the word “capital” to mean “wealth”—helps to conceal his unconventional assumption that all wealth (not just reproducible capital) is a factor of production. The details of Piketty’s model, including his “fundamental laws of capitalism” are discussed and critiqued in the Appendix to this paper.

6. *Ibid.*, pp. 340–348.

7. *Ibid.*, pp. 147–148.

8. *Ibid.*, p. 149.

9. *Ibid.*, p. 397.

10. *Ibid.*, pp. 96–98 and 409.

11. *Ibid.*, pp. 316–319.

12. *Ibid.*, p. 165.

13. *Ibid.*, pp. 340–349.

Piketty explores what happens to the income of the two factors (wealth and labor) when the amount of capital in the economy changes. The dip and rebound in wealth during the 20th century provides a natural observatory. Piketty notes that as wealth dropped in the early 20th century, the share of income going to wealth-owners in France and Britain dropped.¹⁴ That sounds obvious, but it is not. After all, when capital becomes scarcer, the cost of renting it rises. If a 10 percent drop in capital leads to a 10 percent increase in the rental price of capital, then capital's share of income stays the same.

From this and other evidence, Piketty concludes that labor and wealth are highly interchangeable in production. Thus, when wealth is scarce, more workers are hired, and wages rise faster than total income. When wealth is abundant, companies can expand by adding more capital, such as putting one retail clerk in charge of several self-checkout stations. The increased capital still raises wages, but not by as much as total income rises.

Projecting the Model Forward. Many economists have documented that capital's share of income has risen in the past few decades in most advanced economies. Usually, this is interpreted as a result of globalization (which made available a huge pool of labor in China, India, and elsewhere) or technological advancement. Piketty has a unique interpretation: The growth of the share of income going to wealth is a fundamental feature of capitalism.

He estimates that growth will be at most 1.5 percent per year over the second half of the 21st century and that the net savings rate will remain stable at 10 percent. Plugging those figures into his model, he concludes that the return to wealth will remain as high as 4 percent or 5 percent per year. Since the rate of return is so much higher than overall growth, the global wealth-to-income ratio will rise significantly higher than its 1913 peak.¹⁵

Since income from wealth is much more concentrated than labor income, Piketty predicts that the growing importance of wealth will naturally lead to

increasingly higher income inequality. As fortunes grow, inheritances grow as well. In Piketty's prediction, inheritances will be as socially and economically important as they were in prewar Europe.

In this scenario, those who are not born with wealth can never hope to become similarly rich because legacy owners of capital will always get richer at a faster pace. In Piketty's words, "the past devours the future,"¹⁶ and wealth inequality continues to rise.

Piketty's Solution: Heavy Taxation of the Rich. Piketty's solution to preventing this dystopian future is to tax the rich fiercely. He favors progressive income and inheritance taxes with rates as high as 80 percent and a progressive annual tax on wealth levied at the global level to prevent the owners from fleeing the confiscation.

Piketty is under no illusion that his high taxes will raise huge amounts of revenue:

When a government taxes a certain level of income or inheritance at a rate of 70 or 80 percent, the primary goal is obviously not to raise additional revenue (because these very high brackets never yield much). It is rather to put an end to such incomes and large estates.¹⁷

Piketty's Errors

Piketty's argument is an elegant explanation of how the rich stay rich under capitalism. The mechanism is clear: Wealth usually grows faster than wages, and capital can effectively replace labor, so the rich grow perpetually richer unless some outside force—a world war or a confiscatory tax—intervenes. However, when subjected to rigorous review, Piketty's tidy argument quickly falls apart.

Accounting for Housing Prices. Piketty argues that since wealth-to-income ratios generally move in the same direction as capital's share of income, capital will be able to effectively replace labor in the future. Yet this argument relies on conflating home prices with capital investment and ignoring Piketty's own evidence from the 19th century.

14. *Ibid.*, pp. 200–201.

15. *Ibid.*, p. 195.

16. *Ibid.*, p. 571.

17. *Ibid.*, p. 505. Piketty estimates that a broadly applied wealth tax might raise as much as 2 percent of gross domestic product (GDP)—much less than the major existing taxes. *Ibid.*, p. 528.

Piketty's Main Claims	Critics' Response
<p>1. Wealth-to-income ratios and wealth inequality were much higher in Europe circa 1900 than they are today.</p>	<p>Yes. Piketty's new data are a good window into the economic structure of the past.</p>
<p>2. A simple model can account for the way that wealth and income co-evolved over 200 years.</p>	<p>No. The model treats home prices incorrectly, requires an unrealistic substitutability of capital and labor, and misses the major mid-19th-century swings in income. Academic economists have thoroughly rejected it as a predictive model.</p>
<p>3. The model predicts that capital-to-income ratios will rise in the 21st century, and capital's share of income will rise.</p>	
<p>4. The richest earn the highest returns and save most of their earnings, so rising capital will also increase wealth inequality.</p>	<p>Piketty cannot find evidence that the richest earn higher returns. Historical data show a high degree of churning among the top fortunes and top companies.</p>
<p>5. Capitalism has a fundamental tendency toward high and centralized wealth.</p>	<p>No. Most economic models show that economic growth can be balanced. History shows that labor's share of income has changed only a little, with ups and downs, in 300 years of capitalism. Much more importantly, capitalism has a fundamental tendency toward raising all incomes.</p>
<p>6. High wealth inequality breaks down democracy.</p>	<p>Democratic government expanded during the prosperous late 19th century and collapsed in some countries during the low-wealth decades between the world wars.</p>

Housing is a substantial portion of wealth (roughly half) in the countries that Piketty studied.¹⁸ The rise of housing neatly explains why wealth-to-income ratios have risen since 1950, but wealth inequality has remained low: Much of the new wealth is the homes owned by middle-class families.

A study by fellow French economists used an alternate method of measuring the investment value of housing and found that the capital-income ratio

has actually been stable since the 1970s, contrary to Piketty's major claim.¹⁹ According to Piketty's explanation, the rise of wealth should take the form of reinvested profits earned by the very rich. Instead, the increase in capital is largely taking place in real estate and depends on using a particular method of accounting for price and rent changes.

Matthew Rognlie, in a thorough and technical critique of Piketty's model, concludes that Piketty's "justification ... —the simultaneous long-term rise in

18. Ibid., p. 119.

19. Ordan Bonnet et al., "Does Housing Capital Contribute to Inequality? A Comment on Thomas Piketty's Capital in the 21st Century," Paris Institute of Political Studies, Department of Economics Discussion Paper No. 2014-07, April 17, 2014, <http://spire.sciencespo.fr/hdl:/2441/30nstiku669glbr66l6n7mc2oq/resources/2014-07.pdf> (accessed July 8, 2014).

the capital/income ratio and the net capital share of income—vanishes once we remove housing.”²⁰

Piketty’s claim thus fails to explain the dynamics of wealth in the late 20th century, and his model also fails to explain his own data in the 19th century. Figures 6.1 and 6.2 in his book show that wealth’s share of income in France and Britain grew rapidly in the first half of the 19th century and fell rapidly in the second half.²¹ According to Piketty’s claim, this major historical rise and fall of wealth should echo similar changes in the wealth-to-income ratio. Instead, wealth-to-income ratios in France and Britain remained steady throughout the 18th century.²²

In the 21st century, as in the 19th century, movements in wealth’s share of income may occur for many reasons, but Piketty’s model explains very few of those changes.

The Misspecified Savings Function. As in the classic Solow model, Piketty’s wealthy save a fixed fraction of their income. This is a simplification of reality, but perhaps an acceptable one. However, Piketty first takes out the fraction of income that is lost due to depreciation, a fraction that becomes larger as the wealth-to-income ratio grows (as he says it will). Economists Per Krusell and Tony Smith corrected Piketty’s poor choice and found that his prediction of rapidly growing wealth depended heavily on the misspecification.²³

Again, Piketty’s own research should have shown him that his savings function was wrong. He records that the wealthy “in the interwar years did not reduce expenses sufficiently rapidly to compensate for the shocks to their fortunes ... so they eventually had to eat into their capital to finance current expenditures.”²⁴ If the wealthy of the 20th century did not save slavishly to keep up the value of their estates, why expect the wealthy of the 21st century to do so?

Wealth and Workers Are Poor Substitutes. A final problem with Piketty’s model is that he takes an extreme view of the substitutability of capital and labor. Discussed at greater length in the Appendix, the value that Piketty chooses “is far outside the range of values that most economists studying this issue believe empirically plausible.”²⁵ Chart 1 tabulates scholarly attempts to measure the relevant parameter (the elasticity of substitution between labor and capital) and compares them to the value that Piketty chooses in order to reach his desired result.

Rognlie shows that using a value close to consensus, instead of Piketty’s outlying value, would actually reverse the model’s prediction of how capital accumulation affects the return on capital.

Intuitively, this makes sense when one remembers that half of all wealth is residential structures, and commercial and industrial buildings account for a significant share as well. Stefan Homburg uses publicly available data for France to show that machinery and equipment constitute a small and shrinking share of wealth.²⁶ While ATMs and robots might displace human labor, a house would be a worthless substitute.

Once this error is corrected, Piketty’s model fails to predict rising wealth inequality or a rising wealth-to-income ratio.

Piketty’s Disastrous Solution

Although Piketty’s case for a future of perpetually rising inequality based on inherited wealth is weak, any future, even such an unlikely one, is possible. Hence, it is necessary to understand why Piketty’s proposed cure would be worse than the purported disease.

While inherited wealth is central in Piketty’s world, he is disgusted by the high incomes of

20. Matthew Rognlie, “A Note on Piketty and Diminishing Returns to Capital,” June 15, 2014, p. 17, http://www.mit.edu/~mrognlie/piketty_diminishing_returns.pdf (accessed August 18, 2014).

21. Piketty, *Capital in the Twenty-First Century*, pp. 200–201.

22. *Ibid.*, pp. 116–117.

23. Per Krusell and Tony Smith, “Is Piketty’s ‘Second Law of Capitalism’ Fundamental?” June 6, 2014, <http://aida.wss.yale.edu/smith/piketty1.pdf> (accessed July 7, 2014).

24. Piketty, *Capital in the Twenty-First Century*, p. 369.

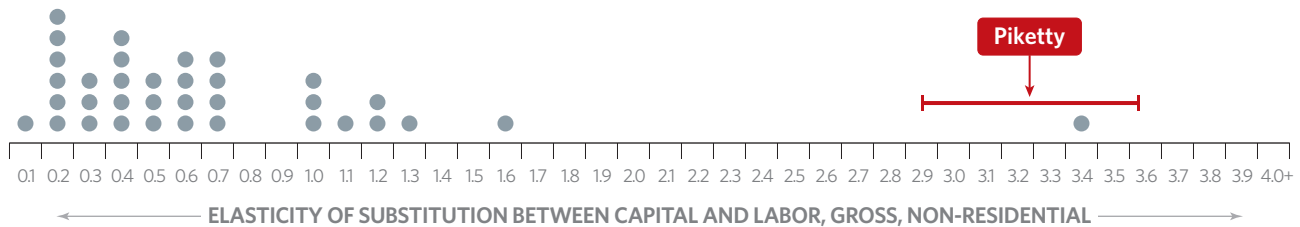
25. Rognlie, “A Note on Piketty and Diminishing Returns to Capital,” p. 8. See also Lawrence H. Summers, “The Inequality Puzzle,” *Democracy: A Journal of Ideas*, No. 33 (Spring 2014), <http://www.democracyjournal.org/33/the-inequality-puzzle.php> (accessed July 24, 2014).

26. Stefan Homburg, “Critical Remarks on Piketty’s ‘Capital in the Twenty-first Century,’” Leibniz University of Hannover, Institute of Public Economics Discussion Paper No. 530, May 2014, http://diskussionspapiere.wiwi.uni-hannover.de/pdf_bib/dp-530.pdf (accessed August 28, 2014).

CHART 1

Piketty Outside Mainstream Estimates of Substitutability Between Labor and Capital

● – PUBLISHED ESTIMATE OF ELASTICITY



Notes: The elasticity of substitution between capital and labor describes how effectively each factor can replace the other in production. A higher elasticity indicates that the two can be more easily substituted. All elasticities have been adjusted so that they apply to non-residential (or “corporate”) capital and are gross of depreciation. Except for Piketty’s estimate, ranges are represented by their midpoints.

Sources: Robert S. Chirinko, “ σ . The Long and Short of It,” *Journal of Macroeconomics*, Vol. 30, Issue 2 (June 2008), pp. 671–686, <http://www.sciencedirect.com/science/article/pii/S0164070407001619> (accessed July 2014); Loukas Karabarbounis and Brent Neiman, “The Global Decline of the Labor Share,” *The Quarterly Journal of Economics*, Vol. 129, No. 1 (February 2014), pp. 61–103; and Thomas Piketty, *Capital in the Twenty-First Century* (Cambridge, MA: Belknap Press of Harvard University, 2014).

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“supermanagers,” especially in the U.S. (He defines supermanagers as executives in large businesses and managers of financial institutions.) Their high annual salaries allow these top 0.1 percent of earners to become *nouveaux riches* after a few years of elite earnings.

His solution to curtailing the attainment of new fortunes is a top marginal income tax rate around 80 percent on incomes above \$500,000 or \$1 million.²⁷ Recalling the high-growth, high-tax postwar decades in the U.S., Piketty does not believe such a high rate of income tax would negatively affect the economy.

Yet taking \$0.80 of every additional dollar top earners make would undoubtedly have strong negative ramifications on the economy.²⁸ Those top earners make those large amounts of money because they are highly productive. They would cut back on how much they work because putting in the extra hours, only to have the government confiscate almost everything extra they earn, would not be appealing. Spread across the more than 1 million workers

to whom the high rate would apply, this tax would reduce the hours worked by the top earners, significantly hurting the economy.

The 80 percent rate would also cripple businesses that pay their taxes through the individual income tax system, known as pass-throughs. The most successful of these important job creators would see almost all of their income go to taxes, leaving them with little left over to reinvest into their businesses and create new jobs.

As noted, even Piketty sees taxes at this level as confiscatory and punitive.²⁹ Unlike taxes that are designed to fund the operation of government, these taxes are expressly intended to curtail economic activity and punish activities that Piketty considers antisocial.

The second prong of Piketty’s tax plan is a global annual tax of 1 percent on wealth over 1 million euros (approximately \$1.3 million) and 2 percent on wealth above 5 million euros (approximately \$6.8 million).³⁰ It would need to be global to stop the wealthy from escaping to places where the tax did not apply. Aside

27. Piketty, *Capital in the Twenty-First Century*, p. 512.

28. Michael Schuyler, “What Would Piketty’s 80 Percent Tax Rate Do to the U.S. Economy,” Tax Foundation *Special Report* No. 221, July 2014, <http://taxfoundation.org/sites/taxfoundation.org/files/docs/SR221.pdf> (accessed July 31, 2014).

29. Piketty, *Capital in the Twenty-First Century*, p. 505.

30. *Ibid.*, p. 517. Piketty is not particular about the exact amounts and percentages, but the concept is the same regardless.

from the immense impracticality of levying such a tax,³¹ it would have devastating economic effects.

Piketty is not proposing to repeal any taxes before implementing the wealth tax. For instance, in the U.S., capital gains, dividends, and corporate taxes would remain in effect. Corporate investment is already double taxed in the U.S., first at the corporate level and then at the individual level with capital gains or dividends. (Piketty admits as much, but claims that the double taxation is important nonetheless because it acts as “withholding.”³²)

Assuming that capital returns 4 percent gross, following Piketty’s estimate, and that the U.S. implemented a wealth tax of 2 percent, the taxes on investment in this case, now three layers deep, would be 104 percent.³³

Taxing away more than the total returns to capital would grind investment to a halt and would cause the value of existing capital to drop precipitously. Working capital would become very scarce—scarce enough that the total return on investment would be as large as it had been before. That would mean drastically lower incomes for everyone in the economy, not just the previously wealthy.

Piketty’s tax plan would eviscerate the fortunes of the wealthiest, while making everyone living in the countries that adopt it considerably poorer because those economies would crumble. Anyone concerned with inequality should abhor such a perverse result.

A global wealth tax would be ruinous in developing countries as well as in rich countries. Countries where people are finally emerging from crushing poverty, largely because of the wealth-generating processes of capitalism that Piketty despises, would

see their progress thwarted and reversed because of a global wealth tax.

What Was Left Unsaid

It is hard to blame Piketty for writing too little—the English version of his book weighs in at 696 pages—but some themes are noticeably absent.

Poverty and Growth. The most glaring oversight is Piketty’s focus on percentages rather than levels of income and wealth. In a telling line, he notes that in France “farmland is virtually worthless today (a few thousand euros per person at most).”³⁴ Yet is that so little? Per capita income in France in 1700 was around 1,000 euros³⁵ and Piketty estimates that farmland was worth 478 percent of national income.³⁶ Thus, French farmland is worth about half as much per person as it was in 1700. However, Piketty’s focus amplifies this 50 percent drop in the per capita value of farmland and obscures a 6,000 percent rise in other forms of wealth.³⁷

Although alleviating poverty and increasing incomes is not the only goal of economic policy, it surely is an important one. Incomes in France in 1700 were on par with incomes in today’s Afghanistan or Uganda.³⁸

Piketty’s focus on the distribution rather than the creation of wealth and income helps to explain why he completely ignores the negative effects of high taxes on the economy.

Democracy. Piketty fails to explain why he dislikes inequality and makes no concerted attempt to persuade readers that reducing wealth inequality is a goal worthy of vastly curtailing economic freedom. When he does give reasons to worry about wealth

31. Curtis Dubay, “Thomas Piketty’s Wealth Tax Would Be an Administrative Nightmare,” *The Washington Times*, May 26, 2014, <http://www.washingtontimes.com/news/2014/may/26/dubay-thomas-pikettrys-wealth-tax-would-be-an-admin/> (accessed July 9, 2014).

32. Piketty, *Capital in the Twenty-First Century*, p. 560.

33. The existing 23.8 percent U.S. capital gains tax, plus the 39.1 percent federal and state combined corporate tax rate mean that the returns to investment are taxed at 53.6 percent before the wealth tax. A 2 percent wealth tax is a 50 percent tax on a 4 percent return, which added to the existing taxes, yields a total tax on investment of about 104 percent.

34. Piketty, *Capital in the Twenty-First Century*, p. 122.

35. Angus Maddison, “Historical Statistics of the World Economy: 1-2008 AD,” University of Groningen, 2010, http://www.ggd.net/maddison/Historical_Statistics/horizontal-file_02-2010.xls (accessed July 25, 2014). Maddison’s estimate is that French real GDP per capita in 1700 was \$910 (in 1990 international Geary-Khamis dollars). Conversions to 2014 euros are the authors’ calculations.

36. Thomas Piketty, supplementary figures and tables to *Capital in the Twenty-First Century*, March 2014, Table S3.2, <http://piketty.pse.ens.fr/en/capital21c2> (accessed May 24, 2014).

37. Authors’ calculations.

38. Maddison, “Historical Statistics of the World Economy.”

inequality, it is to preserve democracy and protect it from control by the rich. Yet a cursory look at history shows that most Western countries extended their franchise during the 19th century, when Piketty's theory says that democracy should have been under siege. The fascist and communist regimes arose not during the era of concentrated wealth but during the interwar years, when wealth was collapsing. The era of wealth concentration was not broken by socialist revolutionaries or captains of industry. It was undone by arrogant Kaisers and Marshals who believed that their nation's blood and wealth was theirs to dispose of in war.

Am I in France? Both Piketty and a number of his critics are guilty of occasionally blurring the lines between countries.³⁹ Piketty's chapter on inheritance is largely based on France where, despite an inheritance tax, inheritances represent a large portion of total wealth, equal to 14 percent of national income each year.⁴⁰ In the U.S., the proportion is much lower, mostly due to higher charitable giving,⁴¹ a younger population,⁴² a lower private wealth-to-income ratio,⁴³ and more wealth held in annuities.⁴⁴

Furthermore, the wealthy must spend sufficiently little of their wealth for Piketty's fear of inheritance to be operative in reality. Larry Summers, former top economic adviser to President Obama and Treasury Secretary under President Clinton, writes, the "general conclusion of the research is that an increase of \$1 in wealth leads to an additional \$.05 in spending. This is just enough to offset the accumulation of returns that is central to Piketty's analysis."⁴⁵

The broad sweeps that Piketty's model tries to explain should—if it really is a model of the fundamentals of capitalism—look quite similar across countries. Yet wealth-to-income ratios have not really risen in the U.S.⁴⁶ Piketty takes pains to explain that income inequality rose rapidly in the Anglophone countries, but not continental Europe due to changes in the U.S. and British tax codes.⁴⁷ His own (admittedly spotty) data on Argentina, China, India, Indonesia, and South Africa follow trajectories that are surprisingly similar to the Anglo data, despite a variety of government styles and even major regime changes.⁴⁸ Maybe France and its continental neighbors are the exception rather than the norm.

How the Rich Get Richer. A necessary link in Piketty's argument is conspicuously absent from his model. Specifically, how do the rich get richer? If everyone's wealth grows at the same rate, the distribution will not change, although wealth might become larger relative to income, as has occurred in France. The rich could get richer in two ways, either by saving a larger fraction of their income or by earning a higher return on their investments. Piketty emphasizes the latter,⁴⁹ but hints at the former.

However, Piketty's hypothesis lacks supporting data. He shows that the largest fortunes of *Forbes*'s 2013 list are much larger than the largest fortunes of 1987, but neglects to emphasize that the fortunes are not the same year to year. In fact, he presents an openly dishonest table of growth rates, calculating from the *Forbes* list of billionaires what he calls the "[average] real growth rate per year" of the "top 1/(100 million) highest wealth holders."⁵⁰ What the

39. For example, Martin Feldstein errs in critiquing Piketty for his "use of estate-tax data," pointing out that the U.S. data are very incomplete. Martin Feldstein, "Piketty's Numbers Don't Add Up," *The Wall Street Journal*, May 14, 2014, <http://online.wsj.com/news/articles/SB10001424052702304081804579557664176917086> (accessed July 25, 2014). Yet Piketty noted the same problems himself, and when he writes about estates, he does so from much more reliable French data. Piketty, *Capital in the Twenty-First Century*, pp. 427–428.

40. Piketty, *Capital in the Twenty-First Century*, p. 380.

41. *Ibid.*, pp. 182–183.

42. *Ibid.*, p. 428.

43. *Ibid.*, p. 171. The lower private wealth-to-income ratio is only the case recently.

44. *Ibid.*, p. 392.

45. Summers, "The Inequality Puzzle."

46. Piketty, *Capital in the Twenty-First Century*, p. 165.

47. *Ibid.*, pp. 332–335.

48. *Ibid.*, p. 327.

49. *Ibid.*, pp. 430–455.

50. *Ibid.*, p. 435, Table 12.1.

table actually presents is the average annual percentage difference in the size of the largest fortunes—regardless of who owned them.

Those who have worked with the *Forbes* lists (usually focusing on the U.S. data) instead document that fortunes tend to soar and plummet quickly. There is high turnover. The new arrivals made the list by growing fantastic fortunes with unbelievable rates of return, but existing fortunes tend to grow modestly and often shrink.

William McBride found that most of those on the *Forbes* list of the 400 richest Americans in 1987 had dropped off the list by 2013. The upper bound on the growth of their fortunes was 2.4 percent per year, with 0.2 percent a more likely estimate. Even the best performing fortunes—the 73 individuals who were on the list in both 1987 and 2013—had a growth rate lower than Piketty ascribes to the entire group.⁵¹

Piketty's best data on unequal returns come from U.S. university endowments. The largest endowments take the most risks, hire the best investors, and earn the highest returns. Yet education is much more static in the U.S. than either private wealth or corporate power. The only company still listed on the Dow Jones Industrial Average from 1910 is General Electric. On the *Forbes* 400 list of the wealthiest Americans, just 36 on the list in 1982 were still on the list in 2012, and only a few more had heirs on the 2012 list.⁵² Yet a 1910 ranking of universities started with Harvard, Chicago, Yale, Columbia, and Cornell, which are still among the leading academic institutes in the country.⁵³ Academia is exceptionally static. Piketty's generalization from academia to family wealth is therefore questionable.

Thus, a key link in Piketty's argument for punitive taxation and, in his Orwellian phrase, "democratic control of capital"⁵⁴ is founded on a hypothesis for which a motivated author could find almost no evidence.

Furthermore, the role of inheritance, which is central to Piketty's fear of wealth concentration, is decreasing as a way of acquitting a fortune. Wojciech Kopczuk and Allison Schrager note:

[The] number of people on the Forbes 400 list of the wealthiest Americans whose wealth had come from inheritances halved between 1980s and 2000s. Moreover, since the 1970s, fewer women rank among the very richest estate taxpayers—another reason to conclude that inheritances are no longer the main path to membership in the super-wealthy club.... [S]elf-made wealth is skewed toward men, whereas inherited wealth is more or less equal between genders.⁵⁵

What Policymakers Can Do

Piketty's major new claim is that wealth inequality will explode to historic levels. After rigorous criticism, that claim seems even less likely than it seemed before Piketty opened up the debate. Wealth inequality might or might not grow in the future, but it seems very unlikely to return to the level seen in Europe in 1900. Equally unlikely is the return of a large class of capital owners who live off their investment income without working full time as well.

Two equally effective and important replies to those making the case that policies are necessary to address Piketty's warnings are that his predictions are based on economic errors and his proposed tax policies would have disastrous effects on jobs, wages, and income.

Critics should also make a positive case that Congress can address the legitimate concern that too many Americans are falling behind in the global economy. Contrary to Piketty, the struggles of low-income Americans have nothing to do with wealth inequality, but are largely driven by globalization and stultifying economic policy. The global econo-

51. William McBride, "Thomas Piketty's False Depiction of Wealth in America," Tax Foundation *Special Report* No. 223, August 4, 2014, <http://taxfoundation.org/article/thomas-piketty-s-false-depiction-wealth-america> (accessed August 6, 2014).

52. Sean Kilachand, "The Forbes 400 Hall of Fame: 36 Members of Our Debut Issue Still in Ranks," *Forbes*, September 20, 2012, <http://www.forbes.com/sites/seankilachand/2012/09/20/the-forbes-400-hall-of-fame-36-members-of-our-debut-issue-still-in-ranks/> (accessed July 25, 2014).

53. J. McKeen Cattell, "A Statistical Study of American Men of Science," reprinted from *Science*, Vol. 24, No. 622 (December 7, 1906), p. 589, <http://babel.hathitrust.org/cgi/pt?id=uc2.ark:/13960/t9x060c2t> (accessed July 25, 2014).

54. Piketty, *Capital in the Twenty-First Century*, p. 569.

55. Wojciech Kopczuk and Allison Schrager, "The Inequality Illusion," *Foreign Affairs*, May 15, 2014, <http://www.foreignaffairs.com/articles/141431/wojciech-kopczuk-and-allison-schrager/the-inequality-illusion> (accessed July 9, 2014).

my has expanded opportunity for everyone at home and abroad. Those with marketable skills or savings to invest have much to gain. At the same time, those with few skills can be replaced more easily, so they have not experienced the same gains. No one policy can boost everyone's human capital quickly. However, Congress can take small steps that would enhance every American's chance to improve his or her own marketable skills or break into the labor market.

Congress. Most importantly, Congress could help to revive economic growth by lessening the burden of its policies on the market. A stronger, growing economy helps families at all income levels. Middle-class and low-income families would greatly benefit because their incomes would rise and they would experience renewed opportunities to find better jobs. When everyone is doing better, inequalities matter less.

Comprehensive Tax Reform. Alleviating the burden of bad policy requires comprehensive tax reform, which would encourage growth by reducing the heavy disincentives that the tax code imposes on productive activities such as working, saving, investing, and taking risks.

Properly executed tax reform would make saving easier by eliminating disincentives. This would, incidentally, reduce wealth inequality by allowing working-class families to convert their own income into wealth.⁵⁶

Reforming Entitlements. Spending on programs such as Social Security and Medicare is on track to explode because of the retirement of the baby-boom generation and the escalation of health care costs. Unless Congress reforms these programs to make them more affordable and effective, they could lead to huge tax increases, especially on the middle class, that would make it more difficult for Americans to rise up the income scales.

Reducing Regulations. Reducing regulations that make it difficult for businesses to invest and add new workers is important for revitalizing the economy as well. It would include replacing the recent health insurance and financial reform laws, as well as easing the glut of environmental regulations promulgated by the Environmental Protection Agency.

State and Local Policymakers. State and local policies can also play a significant role. Urban cen-

ters in the U.S. are a hotbed of opportunity. People with the highest skills and those with the fewest opportunities are equally attracted to big cities. Thus, urban centers have higher than normal income inequality, but for the right reasons. Local governments can benefit both ends of the spectrum by easing regulations and bureaucratic barriers that artificially increase the costs of living and of starting new businesses.

Housing prices are often highest in big cities, not just because demand is high. Restrictive zoning and slow-motion building permitting processes restrict supply, thus raising prices. Restrictions contribute to high rents, which push new employers out to inconvenient locations and unemployed newcomers to neighborhoods with long commutes. Those who own urban real estate in cities such as Boston and San Francisco are the direct beneficiaries of government policies to restrict new building. Likewise, Europe's incredibly restrictive building laws are a major reason that Piketty found such an increase in housing wealth.

Another way for middle-class and low-income families to ascend the income scale and build capital is to start their own businesses. Yet states stifle small-scale entrepreneurship with licensing and regulatory red tape. State and local governments need to reform these policies to make it easier to start new enterprises.

Education. Ultimately, education in the U.S. needs to improve so that those at the bottom of the income scales can acquire the skills they need to benefit from the knowledge-based global economy. That will take decades, but in the meantime opportunity-expanding policies can help to improve the lives of those being squeezed by current economic conditions and poor policies.

Conclusion

The debate Piketty launched with his book will not go away for the foreseeable future. Rebutting his flawed predictions of exploding wealth inequality with substantive arguments and offering positive solutions to help those struggling today are the best ways to win that debate. The arguments laid out in this paper provide guidance on how to do both.

56. Christopher DeMuth, "Capital for the Masses," *The Wall Street Journal*, April 7, 2014, <http://online.wsj.com/news/articles/SB10001424052702304441304579481210667620396> (accessed July 10, 2014).

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Appendix

Piketty's Laws of Capitalism

Piketty lays out his theory by explaining what he calls two “fundamental laws of capitalism.”

The first law determines capital's share of income and is an uncontroversial accounting identity. It says that the portion of national income earned by capital, denoted by α , equals the rate of return on capital (r) multiplied by the capital–income ratio (β), or the amount of capital in an economy compared to the size of the economy.

Piketty's First Law of Capitalism: $\alpha = r\beta$

If capital's share of income (α) rises, the share earned by other factors of production must fall. Following the neoclassical growth model, Piketty assumes that there are just two factors of production: capital and labor. Thus, a rise in α implies a fall in the total share of earnings of labor.

Piketty's second law specifies the capital–income ratio (β). It says the ratio equals the *net* savings rate (gross savings minus replacement of depreciated capital) (s) divided by the growth rate of total income (g).

Piketty's Second Law of Capitalism: $\beta = s / g$

This law, unlike the first, is subject to a battery of caveats.

The second law is “the result of a dynamic process”⁵⁷ and thus “valid only in the long run.”⁵⁸ Furthermore, as Piketty's data on the second half of the 20th century showed, a long-run dynamic adjustment can easily take a few generations.

In addition, Piketty warns that the second law is “valid only if asset prices evolve on average in the same way as consumer prices.”⁵⁹ In the text, Piketty admits that “there are many theoretical reasons why asset prices might evolve differently from other prices over the long run,”⁶⁰ and he acknowl-

edges that capital prices fell and rebounded sharply during the 20th century. Yet he does not rigorously incorporate those changing prices into his analysis. When the price changes are taken into account, Piketty's proclamations about the rise of capital since 1970 evaporate.⁶¹

A final caveat, explored further below, is that assuming savings is a constant share of net income is obviously incorrect when the capital–income ratio rises substantially, as Piketty believes it will. Piketty's misspecification implies that the rich will continue to save the same percentage of their income even when the net return on investment becomes negative. Of course, Piketty never says that the net return will become negative. He just assumes it will remain at 4 percent or 5 percent, contrary to the predictions of his own model.

Piketty's first and second laws can be combined into a single equation that says capital's share of income equals the return on capital multiplied by the net savings rate divided by the rate of economic growth.

Combination of Piketty's First and Second Laws of Capitalism: $\alpha = rs / g$

George Box and Norman Draper wrote that “all models are wrong, but some are useful.”⁶² Piketty's model is useless as expressed in this form. Whereas most economists would treat all three variables on the right-hand side as outcomes of a more complex model, Piketty merely assumes values based on his instincts or a historical average. Since the expression is only valid in the long run, it cannot be evaluated based on data from any particular year.

Implausible Substitutability Between Labor and Capital

According to Piketty's first law, capital's share of income will rise, and wealth inequality will rise com-

57. Piketty, *Capital in the Twenty-First Century*, p. 169.

58. *Ibid.*, p. 168.

59. *Ibid.*, p. 169.

60. *Ibid.*, p. 188.

61. Bonnet et al., “Does Housing Capital Contribute to Inequality?”

62. George E. P. Box and Norman R. Draper, *Empirical Model Building and Response Surfaces* (New York: John Wiley & Sons, 1987), p. 424.

mensurately. Piketty assumes that the rate of return on capital decreases minimally to the point that it essentially holds steady as the capital grows. However, those who have actually attempted to measure the substitutability of capital and labor have nearly unanimously found that the two are poor substitutes. This implies, contrary to Piketty, that the rate of return on capital would fall rapidly if the capital-income ratio grew, so much so that labor's share of net income would grow.

The *elasticity of substitution between capital and labor* is a technical concept that is mathematically connected to capital's share of income. If the elasticity is less than one, the return on capital falls enough when the capital-income ratio rises that capital's share of income declines. If it is greater than one, the return on capital falls slowly enough that capital's share of income increases when the capital-income ratio increases. If it is equal to 1, capital's share of income is the same regardless of the capital-income ratio.

Piketty makes three departures from the research on substitutability. First, he presents his concepts net of depreciation. Second, he includes residential capital in his measure of capital. Third, he arrives at his estimate of elasticity by picking a range of values that he claims would give him the result he believes is correct.

Net Versus Gross. Piketty presents a net elasticity of substitution. Other researchers have almost always measured gross elasticities. Rognlie writes down a conversion formula based on the definitions of net and gross elasticity and shows that the conversion factor for current U.S. variables is about 0.66.⁶³ That is, a gross elasticity of 1 would describe the same model as a net elasticity of 0.66.⁶⁴ However, the conversion factor is also dynamic. When capital is scarce, the conversion factor is closer to 1, and the

difference between net and gross matters less. When capital is abundant, the conversion factor is lower, even becoming negative.

Including Residential Capital. Piketty includes residential capital, whereas the studies reviewed by Robert Chirinko use nonresidential capital or an even narrower category such as "equipment."⁶⁵ As Piketty reports, "residential capital and professional capital" are "roughly equal" in size.⁶⁶ Since buildings are generally less substitutable for labor than equipment is, Piketty's estimate needs a further adjustment in order to compare it with the others.

Chirinko cites two results showing that business equipment is three times as elastic as business structures vis-à-vis labor. From that ratio, he writes down a simple formula for comparing estimates made using only equipment to estimates made using equipment and business structures.⁶⁷ We assume that the same ratio holds between residential structures and business equipment. Applying Piketty's proportions and Chirinko's ratio, we arrive at a conversion factor of 0.67.⁶⁸

Combining the two adjustments, Piketty's elasticity needs to be divided by 0.44 to be comparable to other estimates (or, equivalently, multiplied by 2.26).

Questionable Provenance. To his credit, Piketty does not pretend that his estimate of the elasticity of substitution (1.3 to 1.6) is firm. Instead, he calls his own figure "uncertain and imprecise" and subject to change. His citation directs readers to pages 34–37 of a 2013 working paper. The working paper actually lists the range as 1.2 to 1.6 and makes clear that it is not an estimate in the statistical sense. Rather, it is a back-of-the-envelope calibration aimed to show that a certain model can deliver a certain result with the right parameter.

Piketty's modesty veils his apparent disregard for the actual research on this topic. He has much to say

63. Rognlie, "A Note on Piketty and Diminishing Returns to Capital," pp. 2–6.

64. There are other ways to make this conversion. If the model is fully detailed and specified, one can enter all the model parameters instead of the real-world moments that they are supposed to match. To the extent that the model fails to match other real-world moments, the model-based conversion factor will differ from Rognlie's conversion factor.

65. Robert S. Chirinko, "σ. The Long and Short of It," *Journal of Macroeconomics*, Vol. 30, Issue 2 (June 2008), pp. 671–686, <http://www.sciencedirect.com/science/article/pii/S0164070407001619> (accessed July 10, 2014).

66. Piketty, *Capital in the Twenty-First Century*, p. 51.

67. Chirinko, "σ. The Long and Short of It," p. 682.

68. Specifically, $\sigma_{all} = (\text{residential capital} / \text{total capital}) \sigma_{residential} + (\text{professional capital} / \text{total capital}) \sigma_{professional}$. Piketty estimates that residential and professional are each about half of all capital. Chirinko estimates that $\sigma_{residential} = \sigma_{professional} / 3$. So $\sigma_{all} = 2/3 \sigma_{professional}$.

about the inadequacy of the Cobb–Douglas production function, with its (gross) elasticity of 1.⁶⁹ He also notes that scholars have been moving away from the assumption that the gross elasticity is equal to 1, but fails to note that the scholarship has moved toward a consensus that the elasticity is significantly less than one. Further, the “complete bibliography” he promised in footnote 23⁷⁰ is not included in the online technical appendix.⁷¹ He leaves readers with the impression that he is building on the work of others when in fact he is ignoring it.

In Robert Chirinko’s review of scholarly studies of the elasticity of substitution, which typically used detailed data and rigorous methodology to isolate the elasticity as best they could, the majority found gross elasticities of less than 1 and a handful more found gross elasticities between 1 and 1.6. One outlying study, using data from Mexico, found an elasticity of 3.4. After adjusting Piketty’s estimate to be comparable to the other estimates, it falls in the range of 2.9 to 3.6.

In a paper with Gabriel Zucman, Piketty cites the recent elasticity estimate of Loukas Karabarbounis and Brent Neiman in support of elasticities above 1.⁷² Yet Karabarbounis and Neiman’s estimated elasticity of 1.25—a gross elasticity measured over the corporate sector—is close to the consensus level, while Piketty’s is an extreme outlier.⁷³ Even worse for Piketty, Karabarbounis and Neiman’s estimate implies a *net* elasticity equal to or less than 1 for typical parameters, contradicting Piketty’s main point that the net elasticity is large enough for a capital–income ratio increase to cause a significant rise in capital’s share of income.

Chart 1, in the main body of the paper, displays the estimates presented by Chirinko alongside Piketty’s range. We added Karabarbounis and Neiman’s

recent estimate. Where Chirinko lists a range, we used the midpoint. In two cases where Chirinko presents an original estimate and an alternate interpretation, we preserved both as separate points. For one paper that estimated structures and equipment separately, we present a weighted average as suggested by Chirinko. Not all the estimates are of equally high quality: Chirinko’s own conclusion is that “the weight of the evidence suggests a value ... in the range of 0.40–0.60.”

Implications. For the net return on capital to be where Piketty observes it, the gross return would need to be far above generally accepted levels. Rognlie relates Piketty’s estimates to the scholarly consensus:

[The gross elasticity] required by the story in Piketty—where capital accumulation leads to substantially greater net capital income—is far outside the range of values that most economists studying this issue believe empirically plausible. Given the consensus view, Piketty’s forces are in fact more likely to result in a decrease in net capital income.⁷⁴

Not only is Piketty using an implausible value to make his predictions, but his focus on net income highlights the fact that for any reasonable gross elasticity of substitution (including Karabarbounis and Neiman’s 1.25), the net elasticity of substitution falls below 1 as the capital–income ratio rises. Karabarbounis and Neiman’s elasticity implies that capital’s share of net income peaks when the net capital–income ratio is 1.44, much lower than Piketty measures for any era, and capital’s share of net income falls from 17 percent of income to 12 percent of income as the net capital–income ratio grows from 3 to 6.⁷⁵

69. Piketty, *Capital in the Twenty-First Century*, pp. 217–220. He also fails to note that the Cobb–Douglas elasticity is 1 in gross terms and directly compares it to his 1.3–1.6 range of net elasticities.

70. *Ibid.*, p. 600.

71. Piketty, “Technical Appendix of the Book *Capital in the Twenty-First Century*,” March 2014, <http://piketty.pse.ens.fr/files/capital21c/en/Piketty2014TechnicalAppendix.pdf> (accessed August 5, 2014).

72. Thomas Piketty and Gabriel Zucman, “Capital Is Back: Wealth–Income Ratios in Rich Countries 1700–2010,” *The Quarterly Journal of Economics*, May 21, 2014.

73. Loukas Karabarbounis and Brent Neiman, “The Global Decline of the Labor Share,” *The Quarterly Journal of Economics*, Vol. 129, No. 1 (February 2014), pp. 61–103. For a working paper version, see <http://piketty.pse.ens.fr/files/KarabarbounisNeiman13.pdf> (accessed August 25, 2014).

74. Rognlie, “A Note on Piketty and Diminishing Returns to Capital,” p. 8.

75. The gross production function and parameter a are drawn from Piketty and Zucman, “Capital Is Back,” p. 33, footnote 67. We add linear depreciation at 4 percent per year.

In virtually any plausible model, increases in the capital–income ratio rapidly erode capital’s share of net income.

Misspecified Savings Function

The main message of Piketty’s second “law” is that, when growth slows, the long-run equilibrium capital–income ratio is extremely high. However, that result requires a constant net savings rate, leaving no room for behavior to change in response to changing circumstances. In particular, it requires the wealthy to save the same fraction of their income regardless of the interest rate.⁷⁶

For instance, if growth falls by half, the steady-state capital–income ratio doubles. If growth falls all the way to zero, the capital income will rise toward infinity and consumer spending will fall to zero. If growth becomes slightly negative, as is possible in countries with shrinking populations, then Piketty’s law predicts a negative capital–output ratio.

The trouble lies in Piketty’s choice to use the net savings rate rather than the gross savings rate that the Solow Growth Model uses. While net savings is a valuable descriptive concept, it is a poor law of behavior.

When households follow a constant gross savings rate (s_{gross}), the capital–income ratio in the steady state equals the savings rate divided by the rate of growth (g) plus the rate of depreciation (δ). While it is still simple, this specification of the savings rate approximates a much more sophisticated net savings rule, where the net savings rate declines along with the interest rate.

Solow Constant Gross Savings Rate:

$$\beta = s_{gross} / (g + \delta)$$

When economic growth falls to zero in this model, the capital–income ratio will not rise toward infinity, and consumers will not stop spending—a more reasonable result.⁷⁷ Per Krusell and Tony Smith recal-

culated Piketty’s projections using a gross savings rate rule and concluded:

[W]hen growth falls drastically—say, from 2% to 1% or even all the way to zero—then the capital-to-income ratio, the centerpiece of Piketty’s analysis of capitalism, does not explode but rather increases only modestly. In conclusion, at least from the perspective of the theory that we are more used to and find more a priori plausible, the second law of capitalism turns out to be neither alarming nor worrisome, and Piketty’s argument that the capital-to-income ratio is poised to skyrocket does not seem well-founded.⁷⁸

Correcting the treatment of net savings undermines Piketty’s central argument that the capital–income ratio will rise to new heights in the coming years because of slow economic growth. This greatly reduces the chances that wealth inequality will grow in the way he predicts.

What This All Means for Piketty’s Findings and His Famous Inequality $r > g$

Piketty’s fundamental economic errors seriously undermine his argument and conclusions. The debunking of Piketty’s argument deflates the now famous inequality $r > g$. Piketty claimed that $r > g$ was a good description of the basic tendency of capitalist economies to shift ever more income into the hands of the wealthy.

However, due to his economic errors, $r > g$ holds no new significance. Rather than being the single equation that defines capitalism as a vehicle for perpetually growing wealth inequality, $r > g$ is what it has been for years: a common result with no clear distributional implications. According to Deb-raj Ray:

[$r > g$] itself is a simple consequence of a mild efficiency criterion that been known for many decades in economics.... [A]s far as “explaining”

76. Piketty contradicts this assumption when he notes that “the very substantial increase in [British] public debt in the period 1770–1810 was financed largely by a corresponding increase in private saving (proving that the propertied class in Britain was indeed prosperous and that yields on government bonds were attractive).” Piketty, *Capital in the Twenty-First Century*, p. 130.

77. Krusell and Smith, “Is Piketty’s ‘Second Law of Capitalism’ Fundamental?”

78. *Ibid.*, p. 4.

the rise of inequality goes, Piketty's [$r > g$] is a red herring. [It] has been known to economic theorists for at least 50 years, and no economic theorist has ever suggested that it "explains" rising inequality.⁷⁹

Daron Acemoglu and James Robinson compared Piketty's prediction to the data. They found that the gap between r and g has a negative association with the concentration of wealth in a panel of 28 countries.⁸⁰ Far from confirming Piketty's model, the data show the opposite correlation.

Data Controversy

Among the most widely noted critiques of Piketty was the *Financial Times*'s accusation that Piketty's data was riddled with problems large and small. Economics editor Chris Giles documented a litany of questionable choices that Piketty made in compiling his wealth data.⁸¹ Piketty replied in detail the next week, defending his choices and explaining some definitions.⁸²

Giles's most substantive critique is that Piketty's data on wealth inequality in Britain are cob-

bled together from dissonant sources in a way that conveniently matches Piketty's narrative, but does not follow the underlying sources very closely. Piketty's response criticizes Giles for putting too much faith in a recent wealth survey, but Piketty fails to defend his own choices in hopping from one source to another to construct British data for 1950–1990.

Giles and historian Phillip Magness document similar slipperiness in Piketty's use of U.S. data, where Piketty uses estate tax data when it matches his narrative, but alternative sources where it does not.⁸³ Piketty chose not to defend his own wealth inequality data for the U.S., deferring instead to research currently in progress by Emmanuel Saez and Gabriel Zucman, which shows a much steeper increase in wealth inequality than first reported.⁸⁴

Several commentators have accurately noted that Giles makes some mistakes himself and that the difference between Giles's and Piketty's final numbers are small. However, the controversy may say more about Piketty's integrity in handling the data than about the data itself.

79. Debraj Ray, "Nit-Piketty: A Comment on Thomas Piketty's *Capital in the Twenty First Century*," May 23, 2014, <http://www.econ.nyu.edu/user/debraj/Papers/Piketty.pdf> (accessed July 9, 2014).

80. Daron Acemoglu and James A. Robinson, "The Rise and Fall of General Laws of Capitalism," August 2014, pp. 13–15, <http://economics.mit.edu/files/9834> (accessed August 28, 2014).

81. Chris Giles, "Data Problems with Capital in the 21st Century," *Financial Times*, May 23, 2014, <http://blogs.ft.com/money-supply/2014/05/23/data-problems-with-capital-in-the-21st-century/> (accessed August 13, 2014).

82. Piketty, "Technical Appendix of the Book *Capital in the Twenty-First Century*—Appendix to Chapter 10. Inequality of Capital Ownership: Addendum: Response to FT," May 28, 2014, <http://piketty.pse.ens.fr/files/capital21c/en/Piketty2014TechnicalAppendixResponsetoFT.pdf> (accessed August 13, 2014).

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