Capital in the 21st century

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- On 19 December 2014, the Centre for Economic Policy Research and the Bank of England hosted a discussion forum based around Thomas Piketty's book, *Capital in the twenty-first century*, with a number of economists from academia, public sector bodies and private sector institutions.
- Four speakers presented research on various issues relating to inequality, including: access to education; wealth and taxation policy; and the role of governance and institutions.
- This article presents each speaker's key arguments, and includes a summary of the open-floor debate that followed.

Overview

Inequality has risen within many advanced and emerging market countries. In the United Kingdom and the United States, the share of income that goes to the top 1% of earners has doubled since the 1980s, and their share of overall wealth has also risen over this period (Piketty (2014)). These trends and their public policy implications have been increasingly analysed by academics and policymakers. From a central bank perspective, inequality can affect the fragility of the financial system and growth in the economy.

On 19 December 2014, the Centre for Economic Policy Research and the Bank of England hosted a discussion forum on *Capital in the twenty-first century*, with its author, **Thomas Piketty**, Professor of Economics at the Paris School of Economics.(1)

At the event, four speakers presented research on a number of aspects of inequality.

Peter Lindert, Professor of Economics at the University of California, Davis, discussed the sources of inequality from an economic history perspective. Historical accidents can render economies more equal, and public policies are key to ensuring that they stay equal over time. A successful education policy is one of the key common factors among those countries that currently have relatively low inequality.

Orazio Attanasio, Professor at University College London, presented on the intergenerational transmission of inequality, based on research with Richard Blundell, Professor of Political Economy at University College London. UK cohort data suggest that there is a strong correlation between the cognitive development of five-year old children and their subsequent earnings as adults. Since parental income influences children's development, this result suggests that inequality can be passed down from one generation to the next.

Jaume Ventura, Professor at Universitat Pompeu Fabra, discussed inequality and macroeconomic models. A key challenge for macroeconomists is to build models that can explain the trends in inequality. Capital may have a 'bubble' component, which grows in line with anticipated capital gains. Empirical studies suggest that, on average, capital gains accounted for about 40% of the increase in capital to income ratios across countries between 1970 and 2010.

Timothy Besley, Professor at the London School of Economics, discussed how inequality can shape policy. Liberal democracies tend to have tax systems that rest on the notion that the rich accept taxation in return for secure and well-enforced property rights. But, in the worst case, that contract can be undermined by inequality.

This article briefly considers the links between inequality and central bank objectives, before presenting each speaker's key arguments and a summary of the open-floor debate that followed. **The views expressed do not necessarily represent those of the Bank of England, the Monetary Policy Committee or the Centre for Economic Policy Research.**

(1) Further information on the event is available at www.cepr.org/3562.

Introduction

Inequality has risen within many advanced and emerging market countries. In the United Kingdom and the United States, the share of income that goes to the top 1% of earners has doubled since the 1980s, and their share of overall wealth has also risen over this period (Piketty (2014)). These trends have prompted academics and policymakers alike to re-examine the evolution of inequality and explore its implications (for example, Yellen (2014) and Carney (2014)).

Inequality can have a bearing on a central bank's objectives. It can affect the fragility of the financial system and growth in the economy.(1) A cross-country study by the International Monetary Fund, for example, suggests that lower income inequality delivers faster and more durable growth, and that most redistributive policies have benign direct growth effects.(2) It is also possible that the interaction between rising inequality and cheap credit led to the rise in asset prices, and the expansion in banks' balance sheets, that culminated in the financial crisis (for example, Rajan (2010) and Kumhof and Rancière (2010)).

On 19 December 2014, the Bank of England and the Centre for Economic Policy Research (CEPR) hosted a discussion forum on *Capital in the twenty-first century*, with its author **Thomas Piketty, Professor of Economics at the Paris School of Economics**. Four speakers presented research on four distinct aspects of inequality (see page 36). This was followed by an open-floor discussion with Professor Piketty and the speakers. Participants included a range of economists from private sector financial institutions, academia, public sector bodies and industry associations.

This article sets out a summary of the issues discussed at the event. Box 1 comprises excerpts from the introduction to Professor Piketty's *Capital in the twenty-first century* and provides some historical context on trends in the distribution of wealth. Boxes 2 to 5 present each speaker's key arguments. The article also includes a summary of the debate that followed at the event. The discussion was conducted under the 'Chatham House Rule', so opinions expressed by participants are not attributed to individuals. **Neither the summary of the discussion nor the arguments set out in Boxes 1 to 5 necessarily represent the views of the Bank of England, the Monetary Policy Committee or the CEPR.** Further information relating to the event, including video clips featuring Professors Piketty, Besley and Lindert, is available on Vox, the CEPR's policy portal.(3)

Education, wealth and governance: some issues discussed at the forum

This section presents each of the speakers' key arguments at the discussion forum in stand-alone boxes (see Boxes 2 to 5), as well as a summary of the ensuing discussion with participants.

Much of the discussion was focused on identifying the key influences on inequality over the past, and hence what form possible remedial policies should take. This section is organised around the three broad themes that were identified: the quality of, and access to, education; wealth and taxation policy; and the role of governance and institutions.

The quality of, and access to, education

As Professor Lindert discusses (Box 2), historical accidents can render economies more equal, and public policies are key to ensuring that they stay equal over time. He identifies a successful education policy as one of the main common factors among those countries that currently have relatively low inequality.

Several speakers raised the importance of equal access to university education, citing the example of the United States where unequal access to university education had been associated with the rise in inequality (Box 2). That had occurred despite a significant expansion in higher education numbers in the 20th century, which had largely been focused on families towards the top end of the income distribution.

But a strong case was also made for improvements to education at a much earlier stage. Professors Attanasio and Blundell (Box 3) find, using UK cohort data, that there is a strong correlation between the cognitive development of five-year old children and their subsequent earnings (and health) as adults. In fact, Attanasio and Blundell cite earlier research (Feinstein (2003)) which suggests that children from less well-off socio-economic backgrounds with relatively low development scores are less likely to catch up with other children as they grow older, while richer children's development scores tend to catch up. So the parental environment clearly matters, meaning that inequality tends to be passed along generations. There was general agreement with the conclusion that policy interventions aimed at young children from less well-off backgrounds could have long-run inequality effects.

As Attanasio and Blundell discuss, differences in levels of education matter for the level of inequality. But they cannot explain the recent *increase* in income inequality. This suggested that particular skills were being relatively more highly remunerated than in the past, rather than these skills having become more unequally distributed (Box 3). Some participants suggested that growth in the incomes of the top 1% of earners was likely to reflect their ability to bargain for higher wages.

(1) See Haldane (2014).
(2) See Ostry, Berg and Tsangarides (2014).
(3) See www.voxeu.org/article/capital-21st-century.

Wealth and taxation

A key challenge for macroeconomists is to build models that can explain the trends in inequality that have been identified by Piketty (2014). One observed trend is the rise in the wealth to income ratio in advanced economies since the 1970s. Professor Ventura (Box 4) argues that capital has a fundamental component, which is the part that could be called 'productive' capital, but also a 'bubble' component. This latter part grows in line with anticipated capital gains. He cites findings from Piketty and Zucman (2014), which finds that, on average, capital gains accounted for about 40% of the increase in capital to income ratios across countries between 1970 and 2010. This figure would be even higher were the 2008 financial crisis excluded from the sample.

Participants raised the importance of distinguishing between different kinds of capital. For example, homeownership had typically been less concentrated than other forms of wealth (Saez and Zucman (2014)), which could suggest less inequality. The increased availability of credit may have reduced frictions and lowered inequality in the longer term. But some argued that inheritance still often played an important role, passing inequality on from one generation to the next, and that rises in house prices could disadvantage younger generations if they had to rely on their labour income to afford a home.

Governance and institutions

The discussion turned to the importance of good governance and robust institutions for lowering inequality. For instance, a number of participants argued that, while globalisation may have been one aspect of the rise in inequality within advanced economies, only individual countries' institutional settings could explain why the rise in inequality had been far greater in the United Kingdom and the United States than in countries such as Germany or Sweden.

But inequality, in turn, shapes policy. As Professor Besley discusses (Box 5), liberal democracies tend to have tax systems that rest on the notion that the rich accept taxation in return for secure and well-enforced property rights. In the worst case, however, that contract can be undermined by inequality: those with deep pockets can 'capture' the state, and shape its policies and institutions.

Professor Besley argues that electorates' values can and do shift over time, which can lead to consensus on issues that were previously thought unworkable. One example was the consensus in favour of a National Health Service after the Second World War. Some participants felt that the lack of international institutions with strong democratic foundations meant that tackling inequality, perhaps through a global or regional taxation policy, was harder. But others suggested that it was possible for norms to shift, even at the global level. One example was recent international measures to reduce the extent of tax evasion.

Box 1
Putting capital in the 21st century in context — Thomas Piketty

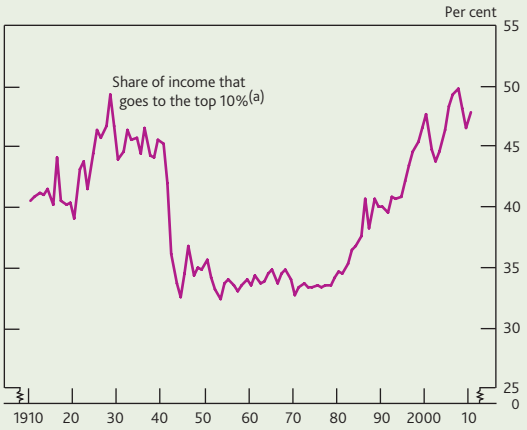
This box comprises excerpts from the Introduction to Piketty (2014).[1]

The distribution of wealth is one of today's most widely discussed and controversial issues. But what do we really know about its evolution over the long term? Do the dynamics of private capital accumulation inevitably lead to the concentration of wealth in ever fewer hands, as Karl Marx believed in the nineteenth century? Or do the balancing forces of growth, competition, and technological progress lead in later stages of development to reduced inequality and greater harmony among the classes, as Simon Kuznets thought in the twentieth century? What do we really know about how wealth and income have evolved since the eighteenth century, and what lessons can we derive from that knowledge for the century now under way?

Modern economic growth and the diffusion of knowledge have made it possible to avoid the Marxist apocalypse but have not modified the deep structures of capital and inequality — or in any case not as much as one might have imagined in the optimistic decades following World War II. When the rate of return on capital exceeds the rate of growth of output and income, as it did in the nineteenth century and seems quite likely to do again in the twenty-first, capitalism automatically generates arbitrary and unsustainable inequalities that radically undermine the meritocratic values on which democratic societies are based. There are nevertheless ways democracy can regain control over capitalism and ensure that the general interest takes precedence over private interests, while preserving economic openness and avoiding protectionist and nationalist reactions.

Since the 1970s, income inequality has increased significantly in the rich countries, especially the United States, where the concentration of income in the first decade of the twenty-first century regained — indeed, slightly exceeded — the level attained in the second decade of the previous century (**Chart A**). It is therefore crucial to understand clearly why and how inequality decreased in the interim. To be sure, the very rapid growth of poor and emerging countries, especially China, may well prove to be a potent force for reducing inequalities at the global level, just as the growth of the rich countries did during the period 1945–1975. But this process has generated deep anxiety in the emerging countries and even deeper anxiety in the rich countries. Furthermore, the impressive disequilibria observed in recent decades in the financial, oil, and real estate markets have naturally aroused doubts as to the inevitability of the 'balanced growth path' described by

Chart A Income inequality in the United States



Source: Piketty (2014).

(a) Includes capital gains.

Solow and Kuznets, according to whom all key economic variables are supposed to move at the same pace.

In a way, we are in the same position at the beginning of the twenty-first century as our forebears were in the early nineteenth century: we are witnessing impressive changes in economies around the world, and it is very difficult to know how extensive they will turn out to be or what the global distribution of wealth, both within and between countries, will look like several decades from now. The economists of the nineteenth century deserve immense credit for placing the distributional question at the heart of economic analysis and for seeking to study long-term trends. Their answers were not always satisfactory, but at least they were asking the right questions. There is no fundamental reason why we should believe that growth is automatically balanced. It is long since past the time when we should have put the question of inequality back at the centre of economic analysis and begun asking questions first raised in the nineteenth century.

For far too long, economists have neglected the distribution of wealth, partly because of Kuznets's optimistic conclusions and partly because of the profession's undue enthusiasm for simplistic mathematical models based on so-called representative agents. If the question of inequality is again to become central, we must begin by gathering as extensive as possible a set of historical data for the purpose of understanding past and present trends. For it is by patiently establishing facts and patterns and then comparing different countries that we can hope to identify the mechanisms at work and gain a clearer idea of the future.

(1) See www.hup.harvard.edu/features/capital-in-the-twenty-first-century-introduction.html. Thomas Piketty (thomas.piketty@psemail.eu) is Professor at the Paris School of Economics.

Box 2

Where has modern equality come from? Lucky and smart paths in economic history — Peter Lindert[1]

In the wake of war and political upheaval, countries across a number of continents found their incomes more equal in the 1970s than had been true of their grandparents' generation in the 1910s. Of today's rich democracies, some have succeeded in sustaining relatively equal distributions of income, while the United States and others have famously drifted towards higher inequality for a third of a century.

The welfare states of Northern Europe are a well-known success story of achieving greater income equality and lower poverty rates. Their tax systems are not much more tilted towards taxing top incomes than are the tax systems of lower-spending rich countries. Rather, these welfare states tend to achieve their progressivity — that is, redistribution towards those with lower market incomes — on the social expenditure side by delivering greater transfers as a share of household income to those with lower incomes.[2]

But has equality been attained in any way other than through annual redistribution? As it happens, there is a smaller group of countries where people's incomes are relatively equal *before* taxes and transfers. They are the 'Pacific Four': New Zealand and three high-income East Asian countries, Japan, Taiwan and Korea.

These countries have had relatively equal income distributions both before and after taxes, as indicated by low Gini coefficients — a commonly used indicator of inequality[3] — relative to other countries (see Annex 1).

The sources of relative equality in New Zealand are relatively less clear, so the following discussion focuses on the experiences of Japan, Taiwan and Korea. All three East Asian countries had a set of 'lucky' accidents that reduced top privileges at different dates before 1980.[4] These countries maintained that equality by implementing a set of smart policies. They have kept inheritance tax rates steady, unlike the United States and Britain. Such taxation gives each new generation of adults a more equal start.[5] They have also maintained relative equality in pay by restricting immigration. Finally, and most importantly, they have developed a successful education system, which is discussed further below.

Young people in these countries have been offered equal opportunity to gain skills, which has increased the supply of skills and held down wages for skilled jobs in these countries. As a result, adult populations in the East Asian countries have attained as many years of schooling, on average, as have adults in other advanced economies. And something about their education systems seems to deliver high achievement, as measured by OECD test scores (Annex 1). How such outcomes were achieved is not obvious; the share of national income spent on public education is not particularly high in Japan or Korea.[6] By contrast, a puzzling inefficiency in delivering education seems to be one of the reasons that the United States, the United Kingdom and Canada have experienced rising income inequality since the 1970s. All three countries spend high shares of GDP on public education, yet they have turned in mediocre test scores. That inefficiency, especially in the United States, may have limited the supply of skills and widened the gap between earnings for different types of jobs.

Thus Japan, Korea, and Taiwan have come up with a policy package that has kept household final incomes nearly as equal as the European welfare states, after all taxes and transfers.

Thomas Piketty (2014) implies that it is possible to have a more egalitarian redistribution without compromising the level or growth of GDP. The era in which the top tax rates on income and inheritance were at their peak in Britain, France, Germany and the United States was also the era in which those countries enjoyed their fastest growth in GDP per capita.[7] The econometric evidence continues to favour his view on the growth issue.[8] And historical cross-country experience does not suggest that there is evidence that real-world countries face a trade-off between efficiency and equity — either when becoming a welfare state, or for countries that equalise market incomes.

(1) See also Lindert (2014). Peter Lindert (phlindert@ucdavis.edu) is Professor of Economics at the University of California, Davis.
(2) See Kato (2003) and Lindert (2004) Volume 1, Chapter 10.
(3) See, for example, World Bank (2014). Ginis based on household surveys tend to understate inequality at the top. This bias has been corrected for three of the Pacific Four (with the exception of Taiwan). In all four cases, however, the available estimates seem to capture a relatively equal distribution within the lower 90% ranks, a view tentatively supported by comparisons with data on wage inequality (Atkinson (2008)).
(4) Japan had equality-improving shocks in two waves: in the late 19th century and then in 1937–52. In Korea's case, the combination of colonisation and war meant that wealth accumulation had to start all over. Inequality in Taiwan was similarly initially restrained by occupation.
(5) As Thomas Piketty (2014) discusses, the rise of inequality in the Anglosphere since the 1970s could relate to reductions in top tax rates on inheritances (and income).
(6) Comparable UNESCO data do not exist for Taiwan.
(7) Piketty (2014), Chapter 14.
(8) See, for example, Ostry, Berg and Tsangarides (2014), or Lindert (2004), Chapters 10 and 18.

Box 3
Human capital and inequality in the United Kingdom — Orazio Attanasio and Richard Blundell[1]

People's earnings are determined by their skills (or 'human capital'), and the price, or wages, of those particular skills. The rise in earnings inequality over the past few decades could reflect rising inequality in either the level of skills or in wages.[2]

Cohort studies offer a unique opportunity to understand these drivers of inequality. These studies follow a group of respondents over a long period of time, and record a wide range of their characteristics at regular intervals. The National Child Development Study (NCDS), for example, has followed its respondents since their birth in 1958, and collects information on things like their health, earnings and educational attainment every five years.

Surveys like this can be used to assess the relationship between earnings as an adult and three sets of variables: some development indicators from when the individual was aged 10–11; some family background variables; and the individual's educational attainment. Annex 2 shows summary results from two regressions using results from the NCDS. Column 1 relates individuals' earnings in 2008 — when they were 50 years old — to their family background; column 2 considers the relationship between earnings and a wider set of factors, including childhood development indicators, family background and educational attainment.

The evidence suggests that differences in parental background and childhood development can explain a significant part of the differences in individuals' subsequent earnings as adults. Column 1 shows a positive relationship between parental income and earnings as an adult. Children with parents in the highest income quintile tended to go on to earn more as adults, and the asterisks indicate that this relationship is statistically significant. But when additional factors are included in the analysis, the effect of having richer parents becomes statistically insignificant, as shown in column 2. Instead, indicators of child development and educational attainment are positively correlated with earnings, as signified by the positive (and statistically significant) coefficients reported in column 2.

These results suggest a possible mechanism through which parental background operates: children develop early and their development is strongly influenced by parental background. This hypothesis is consistent with existing evidence on child development, namely that differences in childhood development persist, and can explain differences in lifetime labour earnings.

Given the importance of early development, the next step is to look at how inequality in indicators of development has evolved over time. The evidence indicates that while differences between children from the richest and poorest backgrounds exist, they have not changed materially over time. In 1970, for example, differences in standardised measures of cognitive development of children of the richest and poorest quintiles equalled almost one standard deviation. The difference between the richest and poorest children was virtually identical in the 2000 cohort.

So inequality in early development has neither deteriorated, nor has it improved substantially over time. This suggests that increases in income inequality seem to have been driven by differences in the 'prices' or returns to skills. Indeed, the wages of people with higher educational qualifications has been rising.[3] Individuals with certain skills might be able to achieve very high remuneration because of specific innovations in technology, or they might be able to capture rents.

These trends have left those with low skills in an increasingly poor lifetime position. This suggests that it is not just the top 1% that is of interest. There are dramatic differences between the bottom 20% and the rest in a variety of outcomes such as health, happiness and child development. It is therefore important to focus sufficiently on the poor and on the design of appropriate policies to reverse their situation and that of their children.

Well-designed policy interventions, such as pre-school educational programmes, have already been shown to have strong and important effects. Mounting evidence indicates that such policies can be effective in reducing these inequalities, as the work of Feinstein (2003), for instance, shows. Well-designed interventions in the early years can have long-lasting impacts.[4] These could reverse the decline in earnings opportunities and well-being for the less advantaged in society.

(1) Orazio Attanasio (o.attanasio@ucl.ac.uk) is Professor at University College London. Richard Blundell (r.blundell@ucl.ac.uk) is Professor of Political Economy at University College London. The views presented in this box are part of ongoing research.
(2) Inequality in earnings could also reflect a rise in the covariance between inequality in wages and inequality in skills.
(3) See, for example, Belfield *et al* (2014).
(4) For examples of policies with long-run impacts see Heckman, Pinto and Savelyev (2013), Campbell *et al* (2014) and Chang *et al* (2014).

Box 4
The metamorphosis of wealth in the 21st century — Jaume Ventura[1]

Thomas Piketty's book provides a sharp long-term view of capitalism with a strong focus on the evolution of wealth and inequality. One of its central concerns is the long-term evolution of the wealth to income ratio. In the early 20th century, the wealth to income ratio was around 600%–700% in the United Kingdom, France and Germany, and around 300%–400% in the United States and Canada. This ratio fell dramatically in the European countries to reach the same level as the North American ones by the middle of the century. Since the late 1970s, however, the ratio has been increasing everywhere. That raises a number of important questions. Is this trend going to continue? Will the wealth to income ratio return to the high European levels of the early 20th century? And what are the implications of the increase in this ratio for inequality?

Piketty (2014) uses a well-known model of capital accumulation developed by Robert Solow in the 1950s. All wealth is assumed to take the form of productive capital. Under standard assumptions, this model predicts that the economy will settle at a steady state in which the wealth to income ratio equals the saving rate divided by the GDP growth rate. Piketty argues that the saving rate is likely to remain fairly stable, but that the GDP growth rate will decline, largely due to a reduction in population growth. The conclusion is that the wealth to income ratio will continue to rise in the future.

A natural first question to ask is whether the assumptions embedded in the textbook model are robust. Capital accumulation models developed in the late 1980s and early 1990s have shown that the growth and saving rates cannot be treated independently. Many of these models predict that the economy may not settle on to a single 'steady-state' path: indeed, a number of simple and reasonable extensions of the textbook model lead either to multiple steady states (Caballero, Farhi and Hammour (2006)), or to large, cyclical swings in economic activity (Day (1982)).

One element of the textbook model that is particularly limiting is the assumption that all wealth is productive capital. This seems to be incorrect both in theory and in practice. For at least 30 years, some formal models have shown that the value of existing assets such as equities or real estate — in other words, wealth — contain both a 'fundamental' and a 'bubble' component. The fundamental component is the value of the productive capital that is embedded in these assets.[2] The bubble component is the additional value that is obtained by reselling the asset. The bubble component is like a pyramid scheme: market participants are willing to purchase the asset at a high price only because they expect future market participants to do so, and this generates capital gains.

How important is this bubble component? Most macroeconomists would accept that the recent evolution of wealth cannot be accounted for by a model that focuses only on the fundamental component. Piketty and Zucman (2014) find that capital gains account for about 40% on average of the 1970–2010 increase in wealth to income ratio, and this figure would have been substantially larger if the financial crisis had been excluded. Back-of-the-envelope calculations by Carvalho, Martin and Ventura (2012) also show that most of the recent fluctuations in US wealth are due to the bubble component.

Wealth may have been productive capital in the past. But it is now a mix of productive capital and 'bubble', defined as the anticipation of capital gains. This metamorphosis of wealth raises important questions. What drives the bubble component of wealth? How does the bubble component affect investment, growth and welfare? Macroeconomics must answer these questions in order to face the challenge from Piketty's work.[3]

(1) Jaume Ventura (jventura@crei.cat) is Professor at Universitat Pompeu Fabra.
(2) That is, the net present value of the cash flows generated by these assets.
(3) Martin and Ventura (2014) provide tentative answers to these questions.

Box 5
State capacities and inequality — Timothy Besley[1]

High levels of inequality can skew the priorities of the state towards the interests of the rich. This makes it harder to build a 'common interest' state, that is, one that serves the interests of the many, not the few (Besley and Persson (2011)). While the classical theory of political economy of redistribution suggests that citizens in the middle of the income distribution will be decisive in choosing the level of redistributive policy,[2] empirical analysis finds limited support for that idea.

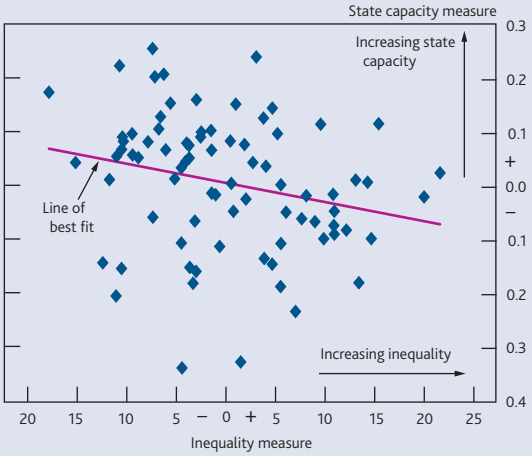
In particular, while the theory predicts that greater inequality should be associated with more redistribution, all else equal, the raw data suggest that countries with more inequality have lower marginal tax rates.[3]

Responding to the challenge of high and rising inequality requires an understanding of the forces that shape the state and its capacities to deliver on behalf of its citizens. There are three dimensions to state capacity in modern states: **legal capacity**, which underpins law and regulation; **fiscal capacity**, which underpins broad-based and progressive taxation; and **collective capacity**, which underpins the provision of goods and services that a pure market-based system might fail to deliver efficiently and equitably. Each of these can be influenced by inequality. For example, the rich tend to prefer strong legal capacity, but weaker fiscal capacity. States where economic elites are powerful can lead to political pressure being applied to reduce fiscal capacity, for example by keeping open loopholes which make tax avoidance easier. Rules which govern residence and requirements to declare worldwide income are particularly relevant for the rich, as are those surrounding the taxation of capital income.

A small 'club' of modern states, mostly in Europe, have over the past 200 years developed these capacities to high levels. The development of legal capacity underpins fundamental equalities — justice, for instance, and universal access to markets. They have also developed the market by protecting property rights and providing predictable conditions for private investment and contracting. Tax systems are rule-based and rest on notions of fairness in which the rich should accept taxation in exchange for security and broad principles rather than arbitrary imposition of taxation. Effective states have also developed systems of provision of collective goods, especially health care, pensions, education and support for the poor.

Besley and Persson (2011) argue that high levels of state capacities stem from the development of cohesive institutions that encourage the state to operate in the interests of the many rather than the few (among other factors). High levels of economic inequality can create a friction in this process. One way to look at this is to examine the relationship across countries between state capacity and the Gini coefficient, a measure of income inequality. Higher inequality (as signified by a higher Gini coefficient) tends to be associated with lower levels of state capacity, as shown by the downward-sloping line in **Chart A**.

Chart A Inequality and state capacity: cross-country evidence[a]



(a) Uses the index of state capacity reported in Besley and Persson (2014). These results are conditioned on the level of income per capita in 2000 and executive constraints up to 2000 as two variables which might be thought to be strongly correlated with state capacity. Inequality measure is based on the Gini coefficient.

Responding to inequality therefore requires a systematic understanding of how high levels of inequality can influence the state's capacity to act. That also calls for a better grasp of how people develop norms and values with shared obligations towards fellow citizens, and how those change over time. For example, the period following World War II saw some profound policy changes, such as the founding of the National Health Service in the United Kingdom and moves throughout the developed world towards the promotion of educational opportunity (particularly in higher education) as well as legislation to limit discrimination against minorities and women.

Economic studies of redistributive taxation have yet to take on board these distinctions fully and the political economy discussion has only recently begun to reflect these concerns.[4]

(1) Timothy Besley (T.Besley@lse.ac.uk) is Professor at the London School of Economics.
(2) See, for example, Romer (1975), Roberts (1977) and Meltzer and Richards (1981).
(3) This is based on top statutory income tax rates in the 1990s for the 67-country sample in Gordon and Young (2005) and the Gini coefficient from Deininger and Squire (1996).
(4) There is a small but expanding literature on these topics, such as Shayo (2009).

Annex 1

Income inequality and educational attainment across countries[a]

	Income inequality before taxes and transfers[b]	Income inequality after taxes and transfers[b]	Student test scores[c]
Welfare states[d]	42.9	26.4	505
Pacific Four[e]	**34.9**	**30.5**	**532**
Other[f]	44.5	33.3	506
United Kingdom	47.4	35.7	502
United States	46.9	37.3	492

Sources: OECD Programme for International Student Assessment, Standardized World Income Inequality Database (Solt (2014)) and author's calculations.

(a) Figures for country groups show simple averages across countries.
(b) Income inequality is represented by Gini coefficients, based on household surveys. A Gini coefficient measures the extent to which the income distribution in an economy deviates from a perfectly equal distribution: a coefficient of 0 indicates perfect equality, while a coefficient of 100 indicates perfect inequality. The table shows data for 2010.
(c) Simple averages of mathematics, reading and science test scores given to fifteen year olds in randomly sampled school districts. Scores are scaled so that the average test score across OECD countries for mathematics in 2003 was 500, with a standard deviation of 100; the OECD-average test score for reading in 2000 is 500, with standard deviation 100; and the OECD-average test score for science in 2006 is 500, with standard deviation 100. The table shows data for 2012.
(d) Comprises Austria, Belgium, Denmark, Finland, France, Germany, Netherlands, Norway and Sweden.
(e) Comprises Japan, Korea, New Zealand and Taiwan.
(f) Comprises Australia, Canada, Greece, Ireland, Italy, Portugal, Singapore, Spain and Switzerland.

Annex 2

Explaining the earnings of adult males in the United Kingdom in 2008

Dependent variable: **Earnings at age 50**[a]	Regression (1)	Regression (2)
Indicators of childhood development		
'Cognitive' factor at age 11		0.0816***
'Non-cognitive' factor at age 11[b]		0.0480***
Parental background: family income at age 10		
Family income in top 20%	0.192***	0.0842
Individual's highest qualification in 2008		
4–5 GCSEs or equivalent[c]		0.0309
2 or more A levels or equivalent[d]		0.138***
Higher education[e]		0.285***

Source: Attanasio and Blundell, ongoing research.

(a) Results are based on male respondents to the 1958 NCDS (1,690 observations). The dependent variable is gross log weekly pay in 2008, when respondents were aged 50. Dummy variables for family income in the second, third and fourth quintiles were also included. *** denotes statistical significance at the 0.99 threshold.
(b) This factor is derived from the Bristol Social Adjustment Guide (BSAG) z-score in the NCDS.
(c) National Vocational Qualification 2.
(d) National Vocational Qualification 3.
(e) National Vocational Qualification 4–5.

References

Atkinson, B (2008), *The change distribution of earnings in OECD countries*, Oxford University Press, Oxford.

Belfield, C, Cribb, J, Hood, A and Joyce, R (2014), *Living standards, poverty and inequality in the UK: 2014*, Institute for Fiscal Studies, London.

Besley, T and Persson, T (2011), *Pillars of prosperity: the political economics of development clusters*, Princeton University Press, Princeton.

Besley, T and Persson, T (2014), 'The causes and consequences of development clusters: state capacity, peace and income', *Annual Reviews of Economics*, Vol. 6, pages 927–49.

Caballero, R, Farhi, E and Hammour, M (2006), 'Speculative growth: hints from the US economy', *American Economic Review*, Vol. 96, No. 4, pages 1,159–92.

Campbell, F, Conti, G, Heckman, J, Moon, S, Pinto, R and Pungello, E (2014), 'Early childhood investments substantially boost adult health', *Science*, Vol. 343, pages 1,478–85.

Carney, M (2014), 'Inclusive capitalism: creating a sense of the systemic', available at www.bankofengland.co.uk/publications/Documents/speeches/2014/speech731.pdf.

Carvalho, V, Martin, A and Ventura, J (2012), 'Understanding bubbly episodes', *American Economic Review*, Vol. 102, No. 3, pages 95–100.

Chang, S, Gertler, P, Grantham-McGregor, S, Heckman, J, Pinto, R, Vermeersch, C, Walker, S and Zanolini, A (2014), 'Labor market returns to early childhood stimulation: a 20-year follow-up to an experimental intervention in Jamaica', *Science*, Vol. 344, Issue 6187, pages 998–1,001.

Day, R (1982), 'Irregular growth cycles', *American Economic Review*, Vol. 72, No. 3, pages 406–14.

Deininger, K and Squire, L (1996), 'A new data set measuring income inequality', *The World Bank Economic Review*, Vol. 10, No. 3, pages 565–91.

Feinstein, L (2003), 'Inequality in the early cognitive development of British children in the 1970 cohort', *Economica*, Vol. 70, pages 73–97.

Gordon, R and Young, L (2005), 'Tax structure and economic growth', *Journal of Public Economics*, Vol. 89, pages 1,027–43.

Haldane, A G (2014), 'Unfair shares', available at www.bankofengland.co.uk/publications/Documents/speeches/2014/speech732.pdf.

Heckman, J, Pinto, R and Savelyev, P (2013), 'Understanding the mechanisms through which an influential early childhood program boosted adult outcomes', *American Economic Review*, Vol. 103, No. 5, pages 2,052–86.

Kato, J (2003), *Regressive taxation and the welfare state: path dependence and policy diffusion*, Cambridge University Press, New York.

Kumhof, M and Rancière R (2010), 'Inequality, leverage and crises', *IMF Working Paper No. WP/10/268*.

Lindert, P H (2004), *Growing public: social spending and economic growth since the eighteenth century*, Cambridge University Press, New York.

Lindert, P H (2014), 'Making the most of capital in the 21st century', *NBER Working Paper No. 20232*.

Martin, A and Ventura, J (2014), 'Managing credit bubbles', *CEPR Discussion Paper No. DP9902*.

Meltzer, A and Richards, S (1981), 'A rational theory of the size of government', *Journal of Political Economy*, Vol. 89, pages 914–27.

OECD (2014), *PISA 2012 Results in Focus*.

Ostry, J D, Berg, A and Tsangarides, C G (2014), 'Redistribution, inequality, and growth', *IMF Staff Discussion Note*, April.

Piketty, T (2014), *Capital in the twenty-first century*, Harvard University Press, Boston. See www.hup.harvard.edu/features/capital-in-the-twenty-first-century-introduction.html.

Piketty, T and Zucman, G (2014), 'Capital is back: wealth-income ratios in rich countries 1700–2010', *Quarterly Journal of Economics*, Vol. 129, No. 3, pages 1,255–310.

Rajan, R G (2010), *Fault lines: how hidden fractures still threaten the world economy*, Princeton University Press, Princeton.

Roberts, K (1977), 'Voting over income tax schedules', *Journal of Public Economics*, Vol. 8, pages 329–40.

Romer, T (1975), 'Individual welfare, majority voting and the properties of the linear income tax', *Journal of Public Economics*, Vol. 7, pages 163–68.

Saez, E and Zucman, E (2014), 'Wealth inequality in the United States since 1913: evidence from capitalized income tax data', *NBER Working Paper No. 20625*.

Shayo, M (2009), 'A model of social identity with an application to political economy: national, class and redistribution', *American Political Science Review*, Vol. 103, pages 147–74.

Solt, F (2014), 'The standardized world income inequality database', working paper, SWIID Version 5.0, October.

World Bank (2014), 'Online tables and indicators', *World Development Indicators*, available at http://wdi.worldbank.org/table/.

Yellen, J (2014), 'Perspectives on inequality and opportunity from the survey of consumer finances', speech at the Conference on Economic Opportunity and Inequality, Federal Reserve Bank of Boston.