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**Trends in Inequality**

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*“The concept of equality of opportunity is an attractive one. However, does it mean that inequality of outcome is irrelevant? In my view, the answer to this question is "no". Inequality of outcome is still important, even for those who start from the concern for a “level playing field'. To see why, we need to start by noting that different between the two concepts. Inequality of opportunity is essentially an* **ex ante** *concept - everyone should have an equal starting point - whereas much redistribution activity is concerned with* **ex post** *outcomes. Those who think inequality of outcome is irrelevant regard concern for* **ex post** *outcomes as illegitimate and believe that, once a level playing field for the race for life has been established, we should not enquire into the outcomes. I believe this is wrong...”*

Anthony B. Atkinson, Inequality - What can be done? 2015.

Introduction

This August, we will mark the tenth anniversary of the start of the global financial crisis. The crisis has exposed many fissures in the capitalist world's economic system, which had been hidden by the curiously long economic expansion that had started in the early 1990s. A savings glut in the emerging world provided capital to the developed world that was intermediated by highly leveraged financial institutions. A decisive shift outwards in loanable funds lowered real interest rates and these promoted an escalation in asset prices and debt levels burgeoned. And to add fuel to the flames, an unholy mix of monetary policy and financial engineering had practically promised to eliminate nearly all uncertainty with an end to boom and bust. As a consequence risk was underpriced and the sustained period of global growth turned out not only to be fragile but also to impact deleteriously on future growth.

This story is well now well known. But there has been a simultaneous sense that increasing globalisation has acted to reduce the returns to labour and increase the returns to capital in advanced economies. This heavy wedge might have meant that income and wealth inequality has increased over this period. The crisis so removed the scales from our eyes and with the arrival of a number of books there has been a re-ignition of the debate on inequality. Indeed one element of the intellectual legacy of this crisis has involved repetition in some quarters of the Marxist warning that capitalism sows the seeds of its own destruction. Such warnings are not new and there has long been a tension between what we might call optimists and pessimists or, perhaps, even Monetarists and Keynesians. The former tend to think of capitalism as essentially a device for the progress of humanity and the latter as a mechanism that is inherently unstable and prone to recession.

One concern is that capital will increasingly be held by a smaller fraction of the global workforce and consequently income and wealth will become increasingly unequal, creating levels of dissatisfaction that will ultimately undermine the stability of the political system. As Tawney wrote in 1931:

‘Democracy is unstable as a political system as long as it remains a political system and nothing more, instead of being, as it should be, not only a form of government but a type of society, and a manner of life which is in harmony with that type. To make it a type of society requires an advance along two lines. It involves, in the first place, the resolute elimination of all forms of special privilege which favour some groups and depress other, whether their source be differences of environment, of education, or of pecuniary income. It involves, in the second place, the conversion of economic power, now often an irresponsible tyrant, into a servant of society, working within clearly defined limits and accountable for its actions to a public authority.’

But let us go over some fundamental macroeconomics: please bear with me, it is worth it. The backdrop to macroeconomic equilibrium is that interest rates can always move to clear goods markets so that aggregate supply and demand match. Output can be thought of as either one of three equivalent quantities: the production of goods (supply), expenditure on those goods (demand) or income (wages, profits or rents) collected by the factors of production in the process of production. We can think of total income being consumed (spent) or saved (or, equivalently, used to buy claims on assets). These savings can be used to buy investment goods (expenditure) and the market for these savings and investments clear at the ‘natural rate’ of interest. Movement in interest rates will ensure that the expenditure is brought into line with production and income at some level where the factors of production are fully employed and for most macroeconomists that is the end of the matter. But if inequality matters, the point of departure is not so much the clearing of goods markets in which output, income and expenditure all equal the same quantity but where debate is focussed on distribution of income: where production, expenditure and incomes becomes increasingly dominated by the owners of capital, which increasingly undermines the importance in the economy of those who rely on labour income alone.

In this lecture, as ever, which will draw heavily on the work of others, I will rehearse the arguments as to why macroeconomists have not concentrated on inequality and then start to consider why distributions may matter. I will then show some measures of inequality to help frame the debate, which we may need to help us in the forthcoming negotiations about the country's future relations with the rest of the world.

Distributions may matter

As we try to understand the information from last June's referendum result it became clear that we could understand the vote share for Leave or Remain in terms of identifiable socio-economic factors. So much so that the referendum vote might be best understood in broad socio-cultural terms and therefore act as a constraint binding on future political choices. The level of schooling, the extent of professional occupation, age, jobs vulnerable to imports, the recent change in the level of immigration and those identifying themselves as English were all significant factors in factors in vote choice. Becker et al (2016) also allow us to consider how income distribution played a role in this ‘rebellion’. I reproduce Figure 1 and use their words:

‘All across the board, more deprivation is associated with a larger Vote Leave share or, vice versa, less deprivation is associated with a lower Vote Leave share. The important point to observe here again is that the tightest relationship between the support for the Leave side is stemming from the sub-index capturing deprivation in education and skills.’

Aggregate shocks also have distributional consequences, my colleague, Oriol Carreras has recently pointed out that the economy-wide inflation shock resulting from the exchange rate depreciation will lead to differences in the way each family, with its own consumption basket, will experience inflation. To illustrate the horizontal axis in Figure 2 splits the income distribution into deciles where 1 denotes the bottom income decile and 10 denotes the top. The vertical axis decomposes total spending into different categories. The height of each bar denotes the share of total expenditure that households devote to each category.

Several patterns emerge. Low income households appear to devote a larger share of their total expenditure towards items of necessity such as food, drinks and clothing (dark blue bar) and paying for their housing rent (light blue bar) than higher income households. Higher income households devote a larger share of their expenditure to their mortgage (top red bar), health, transport, communication and recreation and culture items (dark and light green bars).

The fall in sterling raises the prices of traded compared to non-traded goods. Thus, we need to know which expenditure categories make most intensive use of, for instance, imports of goods and services to get a clue as to which categories will be most exposed to the rise in import prices. We can examine the import penetration rate of each expenditure category, where import penetration rate is defined as the percentage of expenditure accounted for by imports. It turns out that those categories that comprise necessity items, such as food and clothing, are the ones that make most intensive use of imports. As a result, we may expect these categories to be the ones that experience the largest increases in prices following the depreciation of sterling: so low income households may experience higher rates of inflation than high income households over the next few years.

Accordingly it is quite right that policy is now increasingly described not in terms of an aggregate or a representative family but the whole distribution is shown. The Autumn Statement resurrected charts, Figure 3, showing the impact of tax and welfare decisions on the whole distribution and also cumulatively for the rest of this Parliament. The implications of policy choices are clear in terms of households in the lower and upper deciles of the income distribution. I will not comment on the policy implications but simply that we have accepted that the presentation of the distribution matters for transparency and discussion.

The Aggregate View

Macroeconomic theory is dominated by the view that there is a representative agent: a yeoman farmer or a Robinson Crusoe. This person produces, receives income and spends all income. Theory tends to proceed by taking micro-economic problems seriously such as the household consumption problem is evaluated with reference to a utility function and a budget constraint, which accounts for income and expenditure. The solution to the optimisation problems are then analysed numerically with parameters derived from microeconometric studies. Many have criticised the reduction of a complex economy into a single agent, arguing that co-ordination by the market cannot be assumed. Indeed Kirman (1992) argues that important macroeconomic phenomena, such as unemployment, are the result of co-ordination failure. And that representative agent models where there is no trade cannot capture the essence of financial markets and asymmetric information and help us understand government policies aimed at distribution. He goes on to argue that collective or aggregate choice cannot be represented by a single individual and that aggregate behaviour is best understood as a process involving interactions.

There are many assumptions required to arrive at the representative agent but perhaps the biggest is that markets are complete. This is an assumption about risk sharing across different agents. And it states that there are at least as many assets with linearly independent payoff as there are states. If agents have access to these assets they can create securities that provide consumption insurance in different states of nature. In a Pareto optimal outcome all individuals will then be able to share risk perfectly. If all these individuals have the same initial endowments (wealth) they will have the equal consumption or equal utility in all states. But note that individuals with a larger endowment will have higher consumption in all states than agents with a smaller endowment.

Let us suppose that two agents have the same wealth endowment at time 0. If they face individual shocks (positive or negative) to income over time their consumption paths will not tend to move together. But if they can agree to trade the outcomes so that they both get the average of these two shocks, they can eliminate their personal risk. As a macroeconomists I can then think in terms of this average or representative agent. This construct is very useful for thinking about simple time series representations of the economy in terms of series such output, inflation and interest rates but may not allow us to understand extreme outcomes well or points of tension of stress. It is ultimately rather difficult to justify the assumption of complete insurance markets for idiosyncratic consumption risk.[[1]](#footnote-1)

But even if this assumption does not hold it might be that the aggregate behaviour in models where the distribution is taken seriously may still behave in a close approximation to the representative agent model. Krussel and Smith (1998) extend a standard model to income substantive heterogeneity in income and wealth. Because there is no full insurance in this model, the distribution of wealth is endogenous to the set of shocks, which interacts with macroeconomic aggregates. They show that aggregate variables can still be described by the mean of wealth and the aggregate productivity shock. But that to understand issues such aggregate consumption we need to understand that although aggregate wealth tends to be held by one part of the distribution, poor households can explain a large part of the fluctuations in consumption because they live "hand to mouth".

Many macroeconomists, perhaps following the lead of Robert Lucas, concentrate on aggregate growth, which is well explained by growth in total factor productivity as the key to understanding the root causes of poverty elimination within and across countries. Even though Robert Solow, whose growth model I echo with this statement, has also called forcefully for understanding of heterogeneity. The issue is still not fully resolved.

Why Distributions may matter

The analysis of policy implications in macroeconomic models depends heavily on factors such the variance of items such as inflation and output. Better policy will tend to produce lower variances. This is because we tend to assume that households prefer lower to more variance as they do not like risk with a compensating payment. But aggregate variance may mask considerable changes in variance for individual households at different parts of the income distribution.

Let us consider consumption. The variance of household consumption for the representative household is simply the expectation of the squared deviation of consumption growth from its average. If there is one representative household we simply calculate variance for that single individual household. Now consider that the representative household is a construct based on two households who face negatively correlated shocks. The variance of this construct then is a function of the each household's expectation of the squared deviation from its mean and the covariation of each household's income with the other.

Now we are told that the covariation of income across the two households is negative, which drives down the overall variance of the construct. And we can imagine that if the correlation is significantly negative, then the construct will have a lower variance that each individual household. That is why distribution might matter. Sure our imaginary construct is better off but the two real households are both worse off!

I can illustrate with Figure 5 showing the demand and supply of savings. The supply of savings, say from the owners of capital, increase in the average real interest rate, , which we can think of as some combination of the deposit rate and the bond rate. The level of aggregate consumption is set by the , which determines the level of consumption by savers and borrowers. At the unconstrained equilibrium, the external finance premium, is driven to zero and consumption is maximised at for borrowers. When we add in a positive external finance premium, the level of consumption for borrowers is lower and higher for savers. Indeed to the left of , consumption of borrowers and savers at time  move in opposite directions. Total demand in this economy is determined by the average real interest rate,  , and the sensitivity of borrower household consumption to resultant changes in the external finance premium. We show there is a possible equilibrium and note that the external finance premium falls when real rates rise and increases when it falls. So in our economy where there are savers and hand to mouth consumers, consumption is negatively correlated. And a policy that limits aggregate consumption variance may not help borrowers very much at all.

The Inequality Numbers

Let us consider the key facts presented by Piketty (2014), which are as impressive as they are fascinating. And rather like the coffee table books one gets at Christmas, we should all spend some time looking at the charts and figures to get some idea of the impact of capitalist forces at work. I have chosen two of many to fix some ideas. Figure 6 shows the fraction of income in the US earned by the top 10% over the 100 years from 1910. And the average of around 40% masks considerable variation over time, and it would seem casually at least that since the 1970s, the share of income for the top decile has climbed inexorably from just under 35% to around 50%. The top 1% own some 30% of the wealth and that top decile, some 70%.

If we think of these top earners and wealth holders as a fixed group of infinitely lived people then we might be concerned. But all the data says is that if you become a high earner or owner of wealth you may own a large fraction of national income. Estimates of intergenerational mobility suggest that when we move from one generation to the next, high levels of income in the previous generation explain less than 30% of the income of the next generation. And if we move this forward a number of generations and take 0.3 to some power, how rich your ancestors may have been may explain very little of our own income or wealth outcomes. Luck or personal endeavour explain much of our life's outcomes: perhaps as it should be but not in line with a deterministic setting. In other words, every dot represents a different set of people.

`Fundamental Laws of Capitalism'

Piketty explains his prediction on the increasing size of capital by developing two laws of capitalism.

1. The capital share in national income

The first fundamental law is simply an accounting identity that arises from the use of a standard growth model in which output is a function of three factors of production (capital, labour and land) and total factor productivity. The share in national income accruing to each factor of production is determined by the return to each factor of production: the real interest rate for capital, wages for labour and rent for land multiplied by the quantity of each factor employed. So that if the return on capital is 5% and the capital stock is 6 times the level of income, then the capital share in output will be 30%. Indeed there has been some downward trend in the labour share of income in the past couple of decades and this observation may provide some support for the view that the capital share may be set to climb. But it does seem to me that globalisation of the labour force has done much to reduce the labour share or, put more optimistically, equalise global wages.

1. The rate of return on capital compared to the growth in national income

Because the rate of return on capital has been historically higher than the growth rate of income, the second `law' implies that the capital share in income will rise inexorably if the capital stock grows. This prediction is best explained by a simple example. If the return on capital stays at 5% but growth falls to zero, and the capital stock grows in line with a positive level of savings, let us suppose 10%, then the capital stock after a century will account for 80% of income. Now if capital is owned by a small elite, then clearly the fraction of income, and by association its permanent equivalent, wealth, will be increasingly concentrated in fewer hands. But under most standard theory, if growth falls to zero so will the savings rate as there is only a need to save in order to match any depreciation in the capital stock and the ultimate dominance by capital seems rather unlikely.

Only if we are inclined to accept this prediction, then will we wish to accept a policy conclusion that governments ought to place a global tax on wealth, to help prevent the growth of inequality and political turmoil. Taxes on the movement of capital across borders or assets, a so-called Tobin Tax, have been circulating for years. And there have been many debates about the scale and scope of inheritance taxes as wealth moves from generation to generation. These forms of ex post redistribution may be particularly popular, as we can point to the rich and say to the body politic: we want some of that or what did they do to deserve that?. Of course, the income tax system remains progressive and as long as we maintain health care systems, we still have forms of ex post redistribution or safety nets. The need for what we might call ex ante redistribution really involves education - in a world in which human capital matters. And, in fact, the employment of human capital is precisely how most of us the advanced world now make a living - not so much by making but by being. It is tempting to argue that the best form of redistribution is therefore simply to help people to be.

Objections

There are a number of objection that one can make about the approach to the data. In the measurement of inequality, many draw attention to the difference between those at the very top of the distribution: the top percentile. There are many other measures of inequality and there may be good arguments for throwing out the tails and concentrating on the centre of the distribution where most of us live. Let us think first about the actual cross section, with the extremes thrown out, at any single moment. Such a statistic would tell us how we might reasonably expect to live on a median income plus or minus a single standard deviation, where a single standard deviation might simply represent an idiosyncratic shock to any one household around the median. Such an analysis would tell us that the median household is not only immeasurably better off over the long period of capitalism but also that the reasonably expected extent of any deviation from this median is actually quite small: in other words income distribution is not that unequal.

At the bottom end of the distribution, there has been a remarkable reduction in the number in the tail. From 1990 to 2010, the fraction of people living below the poverty line of $1.25 per day in developing countries, fell from 43% to 21%. This fall has taken nearly 1bn people out of extreme poverty and the numbers are forecast to fall below 10% by the end of this decade. The very process that has created such a great concentration of income in the top percentile has also acted to eliminate much, but sadly not yet all, of the extreme poverty at the bottom. The overall fall in labour share in many advanced economies has at its root the same process of levelling that has taken so many of the poor out of extreme poverty. Jobs will be sent to countries where labour is cheaper and labour income will be redistributed at a lower rate there.

If we then move from income to wealth, we have to sum some notion of the current value of all the income a household may receive over its lifetime, where every asset is valued according to its income generation over its lifetime. This is such a difficult and massive undertaking, that the numbers produced by Piketty, which are indicative, are really only educated guesses and rather heroic ones on which to base a theory. Finally, when we argue that the real returns from capital are in excess of the growth rate, that does not really deal with the risk-adjusted return on capital which is nearly always tends to stay close to the growth rate of income per head. So although many of the observations have captured some aspect of the facts they do not tell representative story for the current distribution or its evolution over time: most of us continue to enjoy considerably better standards of living than we might reasonably have expected in previous generations and for that we have capitalism to thank, rather than to blame.

Conclusion

Capitalism is far from perfect. There are many market failures as a result of informational asymmetries, faulty institutions, political calculus and simple mistakes and they mean that outcomes do not match the full information level of social welfare that we might want to choose if we could. The real debate is about second bests. Should controls on the movement - both geographically and inter-generationally - of capital be introduced to help stabilise world economy? Or will these stifle the exploration of new ideas and result in the lower growth we all seem to fear. If capitalism requires a great leveller, is it a question for policy authorities to consider some forms of wealth capture or transfer, which may act on those who have been nothing but lucky - like lottery winners - or should we leave the levelling to death and allow the spirit to roam free over that short life? A fair minded person would observe that because over the very long run successive generations have benefitted more and more from capitalism we ought to think very carefully before abandoning it. The real tension is between those who think that the wait is not worth it and that we might need to level things up a little more quickly. How we do that and retain sufficiently dynamic regeneration is the question we all face.

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***References***

[1] Atkinson, A. B. (2015). Inequality - What can be done?, Harvard University Press, Cambridge, Mass.

[2] Becker S. O., T. Fetzer and D. Novy, (2016). "Who Voted for Brexit? A Comprehensive District-Level Analysis", Cage Working Paper No. 305, University of Warwick

[3] Carreras, O., (2016). "What will your inflation rate be?", NIESR Blog, November 2016.

[4] Chadha, J. S. (2015). "Capitalism, Inequality and Financial Crisis -- Does Piketty's Capital in the Twenty-First Century Offer the Answer?", European Financial Review, February 2015.

[5] HM Treasury, (2016), Impact on households: distributional analysis to accompany Autumn Statement 2016, Crown.

[6] Kirman, A. P., (1992). "Who or What does the Representative Individual Represent?", Journal of Economic Perspectives, 6(2), pp117-136.

[7] Krussel, P. and A. A. Smith, (1998). "Income and Wealth Heterogeneity in the Macroeconomy", Journal of Political Economy, 106(5), pp867-896.

[8] Lucas, R. E., (1988). "On the Mechanics of Economic Development", Journal of Monetary Economics, 22, pp3-42.

[9] Piketty, T., (2014). Capital in the twenty-first century, Harvard University Press, Cambridge, Mass.

[10] Solow, R., (2008). "The State of Macroeconomics", Journal of Economic Perspectives, 22(1), pp243--249.

[11] Tawney, R. H., (1931). Equality, Harper Collins Publishers Ltd.

1. I show this trade as Figure 4. [↑](#footnote-ref-1)