CENTRE FOR MACROECONOMICS

Economic and Social Research Council

The Productivity-Welfare Linkage: A Decomposition

CFM-DP2022-05

Nicholas Oulton

Centre for Macroeconomics, London School of Economics, and National Institute of Economic and Social Research

Email: n.oulton@lse.ac.uk

We often read denunciations of the so-called "trickle-down" theory, the (laughable) idea that economic growth benefits everyone or, put another way. that "the rising tide raises all boats". To the contrary, many commentators believe that economic growth, i.e. rising GDP, benefits only the rich. If so, what's the point of GDP? Why devote so much policy effort to increasing GDP, or even measuring it, if the rich are the only beneficiaries?

Back in 1994, Paul Krugman expressed a different view when he stated "Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker." By standard of living Krugman meant the material things which matter to the average person: food, fuel, housing, health care, holidays, etc. He himself defined productivity as GDP per worker, though GDP per hour worked is a better measure.

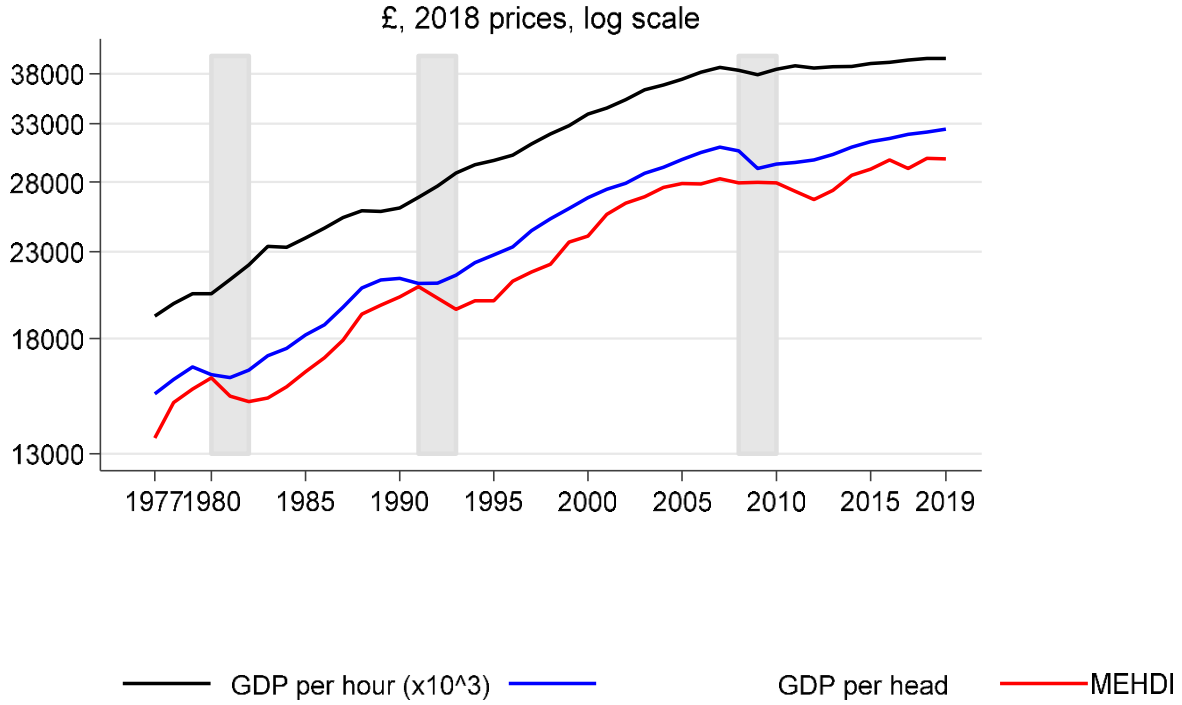
So who is right, Krugman or the opponents of trickle-down theory? In my discussion paper "The productivity-welfare linkage: a decomposition" I examine the evidence, focusing mainly on the UK. My findings are summarised in the chart and the table below. Consider first the chart. This shows productivity in black alongside the standard of living or welfare in red, from 1977 to 2019. Productivity is defined as GDP per hour worked. The standard of living or welfare is measured by what the Office for National Statistics calls Median Equivalised Households Disposable Income or MEHDI. Both measures are in real terms. (The chart also shows another common measure, GDP per head, in blue.)

Let's first unpack the meaning of MEHDI. Households disposable income is the income received by households from all sources (wages, pensions, social security benefits, interest and dividends, etc) after tax. "Equivalised" means that the cash income of each household has been adjusted to reflect the size and type of the household, e.g. whether there are any children present. "Median" means that the income is that of the typical individual, i.e. half of all the individuals in the population have a higher income and half have a lower one. As a measure of welfare the median is

better than the arithmetic mean: a rise in the arithmetic mean could be due to a few oligarchs getter richer with everyone else no better off or even worse off.

Back to the chart. The vertical axis is on a log scale so a steeper line indicates faster growth. Over a longer time horizon Krugman's intuition is verified. Productivity and living standards move together over the whole 43-year period 1977-2019 and also within the three sub- periods defined by the three business cycles which span these 43 years: see the table. In other words over the whole period the typical person in Britain has become substantially better off as productivity has risen. However the picture has clouded since the financial crisis hit in 2008. Both productivity and the standard of living have risen very slowly since 2007.

Productivity and welfare, 1977-2019



Note: Shaded bars mark recessions; MEHDI: real Median Equivalised HDI.
Source: Office for National Statistics; see text for details.

Growth rates of the standard of living and of productivity, 1977-2019 (% p.a.)

	1977-1990	1990-2007	2007-2019	1977-2019
Standard of living	3.07	1.96	0.47	1.88
Productivity	2.35	2.34	0.21	1.73
Standard of living by quintile				
Lowest (poorest) quintile	1.21	2.41	0.14	1.39
Highest (richest) quintile	4.43	2.19	0.03	2.26

Source: Office for National Statistics; see text for details.

Note: Standard of living is measured by real Median Equivalised Household Disposable Income, productivity by real GDP per hour worked. The standard of living is deflated by the CPIH excluding council tax. Real GDP is the chained volume measure of GDP at market prices. The standard of living of the lowest quintile is the median EHDI in that quintile; similarly for the highest quintile.

It is also interesting to note from the table that the standard of living of the poorest fifth of individuals also rose substantially up till 2007, even though the richest fifth did better (mainly because the latter did particularly well over 1977-1990).

The standard of living and productivity are ratios but both their numerators and their denominators differ. However they can be shown to be linked by a series of factors. If we multiply productivity by eight other factors the result is the ONS measure of the standard of living. As the paper shows the following decomposition is exact:

Standard of living = Inequality effect x Relative price effect x Equivalisation effect x HDI share in GDP x Labour market factors x Productivity.

The inequality effect is measured by the ratio of median EHDI to mean EHDI; this ratio falls as inequality rises. The relative price effect arises since GDP and MEHDI are deflated by different price indexes, GDP by the GDP deflator while MEHDI is deflated by the consumer price index including housing (CPIH). A rise in the CPIH relative to the GDP deflator means that, other things equal, living standards rise more slowly than productivity.

The labour market factors are Labour intensity (hours worked per worker), Labour force participation rate, Adult population (aged 16 and over) as a proportion of the total population, and Unemployment rate, all these to be multiplied together. Multiplying all nine factors on the right hand side together produces the left hand side, the standard of living. With the factors as defined in the paper, this is a mathematical identity, i.e. it is necessarily true at all times. The decomposition is not unique: other factors could be chosen. But the ones used here are all of economic significance in their own right.

In the paper I quantify this decomposition for the UK over the period 1977 to 2019. I find that productivity growth was far and away the most important factor in accounting for the growth of living standards which was substantial up to 2007. Rising inequality prior to 2007 retarded the growth of living standards but not by much. Since 2007 productivity growth has

collapsed as has also the growth of living standards. The fall in the latter has been mitigated a bit by a fall in inequality. The four labour market factors changed substantially but their movements largely cancelled out.

The message of the chart and the table, backed up by the decomposition, is unequivocal.

Krugman was right! Overwhelmingly, productivity growth accounts for the growth of living standards, at least for the UK over the period since 1977. Of course we could also achieve some improvement in median living standards by redistributing income from the wealthy to

the less well off. But given that median living standards have risen by a factor of 2.2 since 1977, no feasible redistribution could have achieved anything on this scale. So if you want to raise living standards you have to raise productivity.