Median and mean income analyses

Their implications for material living standards and national well-being

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Summary

This paper argues that median income analysis should be used to complement mean income analysis because median analysis gives a better indication of the level of economic well-being of the 'typical' household. Since the income distribution is positively skewed, mean analysis is influenced by extreme observations at the top end of the distribution, resulting in the mean exceeding the median. The paper shows that micro (household) data gives a better indication of national economic well-being than macro (National Accounts) data. It argues that final household income may be a preferable income variable for assessing material well-being because it includes all earned income and benefits paid in kind.

Introduction

A country's standard of living is often measured by income (Gross Domestic Product (GDP)) per person, with higher per person income indicating higher living standards. Alternative measures used by development practitioners include the Human Development Index, and accessibility and quality of education and health. The Commission on the Measurement of Economic Performance and Social Progress (CMEPSP) (2009) defines well-being as a multi-dimensional concept concerned with not only income, but also non-economic aspects of life like political voices and governance, social networks and relationships, the environment and security. The multi-dimensionality means there is no single indicator to summarise it, thus requiring the establishment of a system that captures all the relevant dimensions.

The question of whether or not GDP is a good indicator of national economic well-being has been debated frequently in economic analysis (Nordhaus and Tobin, 1973; Zolotas, 1981; Boarini et al, 2006). The topic has been addressed in a vast research literature (Nordhaus and Kokkelenberg, 1999; CMEPSP, 2009; Chiripanhura, 2010), resulting in proposals to develop and emphasise other measures of national economic well-being. GDP is criticised as a poor indicator of a nation's economic well-being (though it was never designed for that (Vanoli, 2005) because it does not measure some activities inside the production boundary well, and it excludes some determinants of welfare that are outside the production boundary (Allin, 2007).

Mean analysis of National Accounts indicators, such as consumption, income and wealth, to indicate economic well-being suffers from the drawback that it masks distributional differences, thus creating an impression of improving material living standards of all members of society, which may not be the case. To overcome this limitation, CMEPSP (2009) (Recommendation 4) proposed the increased use of median analysis to supplement mean analysis. This is because the median is not sensitive to extreme values (very large or small values) at either end of the income distribution. Two numerical examples in **Box 1** illustrate this point.

Box 1 Illustration of median and mean income calculations

The median household is the one whose income sits in the middle of a ranked household income distribution, with the same number of (household) incomes on either side.

Assuming five households with incomes £10, £20, £30, £40 and £50.

Mean income is given by: $\frac{10 + 20 + 30 + 40 + 50}{5} = \frac{150}{5} = £30$

Median income is also £30 (that is, the income in the middle after ranking the incomes).

Suppose that another five households have incomes £10, £20, £30, £40 and £200.

Mean income is given by: $\frac{10 + 20 + 30 + 40 + 200}{5} = \frac{300}{5} = £60$

Median income is, again, equal to £30.

A change in income at the top of the distribution has caused the mean to double while the median remains the same. The median more accurately reflects the income of a 'typical' household.

This paper examines the different pictures of material living standards presented by mean and median income measures. It uses real GDP per person as the benchmark and compares this with household mean and median incomes. It builds on the statistical reasons why the median may be better than and/or need to supplement the mean by arguing that when measuring the level of national economic well-being, focus should be on the 'typical' rather than the 'average' household. It may also be essential to have both average analyses in order to get a fuller picture of living standards.

The paper is structured as follows. The next section explains the concepts applied in the analysis and also describes the data sources. This is followed by comparative analysis of mean and median incomes from an international perspective and from a single country (UK) perspective. The article also explores disaggregated household income data. It concludes that final income median analysis best indicates the level of economic well-being of the 'typical' household.

Concepts and data sources

The paper uses the household as the main unit of analysis, in line with the CMEPSP's recommendation to emphasise the household perspective. A household is defined as a single person or a group of people who have the same address as their only or main residence, and who either share one meal a day and/or share the living accommodation (McCrossan, 1991; GSS, 1996). A household with more than one person enjoys lower consumption, housing, and other costs per person. This is because average fixed costs decline as the household size increases. For example, the price of a television licence is fixed irrespective of the number of persons living in a house, but the price per person falls as the number of people increases. A household adjusted for declining cost per person is called a consumption unit. It can be argued that consumption unit analysis gives a more accurate image of national economic well-being than per person analysis.

This article examines 'equivalised' household income. 'Equivalisation' means that household income is adjusted for household size and composition. This accounts for households of different sizes and/or composition requiring different levels of income to achieve the same standard of living. Although households may have the same equivalised income, it does not necessarily mean that they enjoy similar living standards. This is because they may differ in other characteristics. An example is whether or not the households own or rent their accommodation (Barnard, 2010), an issue not taken into account by equivalisation.

Two equivalisation scales are used. The McClements equivalence scale is applied to UK-only data, before housing costs are deducted (ONS, 2004; OECD, 2009; Anyaegbu, 2010). This scale takes into account household composition, size, and age. Total household income is divided by the equivalence number to get the equivalised household income. The Square Root equivalisation scale is applied to international household Luxembourg Income Survey (LIS) data: the equivalised household disposable income is obtained by dividing unadjusted household income by the square of the number of persons in a household, irrespective of household members' demographic characteristics¹.

Five different income variables are analysed and **Box 2** shows how each is calculated.

The income values are converted to real values using the implied GDP deflator (2008 = 100) for Household Final Consumption Expenditure from the UK National Accounts as a way of removing price effects. GDP data is seasonally adjusted and is a chain-linked volume measure. In line with the income variables in described in Box2, there are five possible median and mean analyses.

Data sources

The analysis uses National Accounts GDP data as a benchmark. International GDP data is obtained from the Organisation for Economic Co-operation and Development (OECD) database. It is measured in current US dollar prices and current purchasing power parity². International equivalised median household disposable income data comes from the LIS. This is data from micro datasets that has been weighted to reflect national income levels. For the detailed UK case study, National Accounts chain-linked volume measured GDP data is used. In addition, the most

recent wave of the Living Costs and Food (LCF) Survey, known as the Expenditure and Food Survey before 2009, is used. The LCF survey collects data on household incomes and expenditures and it covers approximately 6,000 private households in the UK each year. The data is weighted with census-based data. Barnard (2010) discusses the weighting procedures and limitations of the LCF survey. The LCF is chosen over other data sources like the Family Resources Survey because the former allows for the examination of more stages of household income (see Box 2), as it contains both income and expenditure data. This makes it possible to fully explore why median income analysis should complement mean income analysis.

Box 2 Definitions of income variables

Earnings

plus Investment income

plus Occupational pension income (all before taxes)

equals **Original Income**

plus Cash benefits paid by the state (such as retirement pensions, child benefits)

equals **Gross income**

less Direct taxes

less Compulsory Social Insurance contributions

less Local taxes

equals **Disposable income**

less Indirect taxes paid by households

equals **Post-tax income**

plus Benefits paid in kind

equals **Final income**

International comparisons of the economic well-being implications of mean and median income analyses

Given the limitations of mean income analysis (GDP per person) mentioned previously, analysis per consumption unit gives a better picture of material well-being, and median analysis gives important supplementary information to mean analysis (CMEPSP, 2009). The advantage of using

household data is that it can be adjusted for composition (because males and females have different resource demands and usages) and size (because there are economies of scale in consumption which reduce average costs). Median income analysis allows for the incorporation of demographic and distributional issues in the analysis of the economic well-being of the 'typical' household. CMEPSP (2009) notes that median analysis may be difficult in a National Accounts context because it is difficult to derive the median, and also because macro data comes from a range of different sources, some of which include institutions not classified as households. However, it is possible to carry out median income analysis using weighted micro level survey data.

Taking GDP per person as the starting point, **Figure 1** shows the evolution of the series for seven OECD countries since 1970³. The figure shows that Luxembourg has consistently had the highest GDP per person. Over the period, the rankings of most countries changed little, with growth in France, USA, Germany, UK and Japan averaging around two per cent per annum. Luxembourg's growth accelerated from 1982, and Ireland's from 1994, giving the two countries overall growth of nearly three per cent and four per cent per annum respectively. Taking GDP per person to indicate the level of material living standards⁴, Figure 1 implies that Luxembourg has consistently had higher living standards, followed by the USA.

Figure 1 Volume GDP per capita in selected countries, 1970–2008

\$ US (2000 constant purchasing power parities)

Source: OECD database

A better indication of the state of economic well-being for citizens of a particular country may be obtained from micro rather than macro data. However, there is a challenge to international

comparative analysis arising from the lack of a consistent household dataset across countries. Fortunately though, the LIS puts together reasonably comparable international household disposable income data from micro data sources. Data for the years 2000 and 2004 clearly show the different pictures that emerge using median and mean analysis⁵.

Table 1 shows that, using median household income to show the level of material living standards, the highest level, in 2000, was for Luxembourg followed by USA, Germany, UK, Ireland and France. Using mean income, Germany and the UK swap places. Luxembourg experienced the highest disposable median income growth, followed by the UK, and for both countries median disposable income growth was higher than that of GDP per person. This may be indication of declining inequality.

Table 1 GDP per person and equivalised median household disposable income for six OECD countries in 2000 and 2004

Country	Equivalised median household disposable income in US dollars, current PPPs						GDP per person in US dollars, current PPPs		
	2000		2004		Percentage change		2000	2004	Percentage change
	Mean	Median	Mean	Median	Mean	Median			
Luxembourg	31,079	27,507	39,235	34,995	26.2	27.2	53,383	64,967	21.7
USA	28,981	24,094	32,195	26,672	11.1	10.7	35,051	40,267	14.9
Germany	20,245	18,051	23,316	20,646	15.2	14.4	25,952	29,895	15.2
UK	20,599	17,028	26,384	21,563	28.1	26.6	26,074	31,785	21.9
Ireland	19,122	17,010	24,365	--	27.4	--	28,647	36,445	27.2
France	18,386	16,067	--	--	--	--	25,276	28,269	11.8

Source: LIS for household data and OECD database for GDP data

The rank order of the countries changes if one uses GDP per person to measure the level of material living standards. Luxembourg, USA and France retain their positions as before, but Ireland climbs two positions to become third highest, and Germany falls two places to become fifth. Between 2000 and 2004, Ireland experienced the highest GDP per person growth (27.2 per cent), followed by the UK. Overall, GDP per person gives the impression of higher material living standards than equivalised median household income. By construction, GDP figures tend to overstate the current level of economic well-being and hence also give the wrong comparative image between some countries⁶. Thus, household income analysis gives a better picture of well-being. Although disposable incomes data (Table 1) may be readily available for some countries, disposable income tends to underestimate the actual level of household economic well-being because it does not include benefits paid in kind that are an important component of household resources in some countries. Final income would be preferable, but national data on benefits paid in kind is scarce and fraught with valuation challenges, limiting the scope for international comparative analysis.

Table 2 **Trend in mean and median real household incomes**

	Average annual change mid-1980s to mid-1990s			Average annual change mid-1990s to mid-2000s		
	Median	Mean	Deviation in growth (Median - Mean)	Median	Mean	Deviation in growth (Median - Mean)
Australia	..	..	..	2.2	2	0.2
Austria ¹	2.8	2.7	0.1	-0.6	-0.6	0
Belgium ¹	0.4	0.8	-0.4	1.2	1.5	-0.3
Canada	-0.2	-0.1	-0.1	1.1	1.4	-0.3
Czech Republic	..	..	..	0.5	0.6	-0.1
Denmark	0.9	0.9	0	0.9	1.1	-0.2
Finland	0.8	1.2	-0.4	2.5	2.9	-0.4
France	0.5	0.3	0.2	0.8	0.8	0
Germany	1.2	1.4	-0.2	0.6	0.7	-0.1
Greece	0.3	0.1	0.2	2.9	2.9	0
Hungary	..	..	..	1.1	1.1	0
Ireland ¹	3.2	3.1	0.1	8.2	6.6	1.6
Italy	0.6	0.8	-0.2	1	1.3	-0.3
Japan	1.8	1.9	-0.1	-1	-1.1	0.1
Luxembourg	2.4	2.7	-0.3	1.5	1.6	-0.1
Mexico	1.1	2.6	-1.5	-0.2	-0.4	0.2
Netherlands	2.8	3	-0.2	2	1.8	0.2
New Zealand	-0.6	0.3	-0.9	2.3	1.9	0.4
Norway	0.4	0.5	-0.1	3.8	4.3	-0.5
Portugal ¹	6.2	7.3	-1.1	4.2	4.3	-0.1
Spain ¹	3.2	3	0.2	5.5	5.1	0.4
Sweden	0.9	0.9	0	2.2	2.3	-0.1
Turkey	-0.8	0.4	-1.2	-0.3	-1.9	1.6
United Kingdom	1.9	2.8	-0.9	2.1	1.9	0.2
United States	1	1.4	-0.4	0.4	0.7	-0.3
OECD-22 ²	1.4	1.7	-0.3	1.9	1.8	0.1
OECD-20 ³	1.5	1.7	-0.2	2.1	2.1	0

1. Changes over the period mid-1990s to around 2000 for Austria, the Czech Republic, Belgium, Ireland, Portugal and Spain (where 2005 data, based on EU-SILC), are not deemed to be comparable with those for earlier years.

2. OECD-22 refers to the simple average for all countries with data spanning the entire period (i.e. excluding Australia, the Czech Republic and Hungary, as well as Iceland, Korea, Poland, the Slovak Republic and Switzerland).

3. OECD-20 refers to all countries mentioned above except Mexico and Turkey. Income flows have been deflated with each country's consumer price index.

Source: Adapted from CMEPSP, 2009, page 119.

Similar results, save for Luxembourg, emerge using data from a larger sample of countries in **Table 2**. Starting with the fact that income distribution is positively skewed; higher median income growth over mean may be indication that income distribution is becoming more equal. Equality between mean and median income growth may indicate no change to the distribution, and higher mean over median growth may indicate growth in income inequality. Table 2 shows real household mean and median incomes growth for 22 OECD countries between mid-1980s and mid-2000s.

Although the figures in the table are not directly comparable to figures from National Accounts because they are from micro data sources, they indicate international differences in material well-being that may not be discernible from National Accounts. For most of the countries, median income growth was less than mean income growth in the 1980s, implying possible growth in inequality, and mean analysis overstating living standards for the 'typical' household. Between 1990 and 2000, fewer countries had mean income growth greater than median income growth, suggesting greater change towards more equitable distribution. Higher growth of median income indicates growth in income of the 'typical' household, which may be associated with improving living standards.

Data problems (such as frequency and availability and differences in collection methods) limit the extent and depth of international median income comparative analysis. Single country micro data analysis provides a good window through which to see the pictures presented by mean and median income analysis. With micro data, both mean and median incomes can be equivalised, thus isolating distributional issues. It is also possible to incorporate in-kind benefits offered by the government since they play an important role in households' well-being status. In the following section, LCF survey data is analysed to provide insights into the level of well-being in the UK.

LCF survey mean and median analyses

The UK's LCF survey data for the period 1998 to 2008, in line with the previous discussion, supports the idea that mean analysis must be supplemented with median analysis to get a fuller picture of material living standards. **Figure 2** plots final household income data. Equivalised mean final household income grew by an average of nearly three per cent between 1998 and 2008. In this case, mean household income gives a better picture of material living standards and hence the level of economic well-being than GDP per person because the former has been equivalised. Yet again, mean household income is problematic because it overstates material living standards (because it is influenced by extreme values). More information is gained by examining median household income. Median income grew by an average three per cent per annum between 1998 and 2008. Both averages declined between 2007 and 2008 because of the economic downturn, but more so for median income.

The absolute difference between mean and median household final income changed gradually between 2002 and 2008. Although mean income remained higher than median income over the period, median income grew at a faster rate. It is possible to gain additional insight into the different pictures emerging from mean and median income analyses by analysing the two averages in index form, as shown in **Figure 3**.

Figure 2 **Equivalised mean and median real final household incomes in the UK, 1998–2008**

£

Source: Office for National Statistics

Figure 3 **Indices of GDP per capita and median and mean real final household income in the UK, 1998–2008**

Index (1998/99 = 100)

Source: Office for National Statistics

The figure confirms that median income grew at a faster rate than mean income, indicating positive change towards improved economic well-being and greater equality. However, it declined at a faster rate than mean income between 2007 and 2008 because of, among other reasons, the weak growth of income for low paid workers, rising unemployment, and growth in inequality.

Mean and median income analyses of other income variables

This section explores the income variables in Box 2. For all the income variables, the mean is greater than the median, confirming the arguments developed already, including that median income gives a better indication of the standard of living of the 'typical' household.

The original, gross and disposable income variables show stability over time, indicating no notable change in the income distribution, but an upward trend in the standard of living (see the **Annex**). The post-tax and final income variables also show an upward trend, but taxes and in-kind benefits ensured that median income grew at a faster rate than mean income, causing inequality to decline over time.

Since both mean and median incomes are equivalised, the difference between the series is a reflection of the structural composition of the income variables as well as the positive skewness of the distributions. The implications of mean and median income analysis on economic well-being are clear: mean analysis gives the impression that households have higher economic well-being than median analysis, but this may not necessarily be the case. Contemporaneous analysis of the two averages gives a full picture of the state of living standards. The implication of income composition on economic well-being is illustrated by disposable and final incomes as shown in **Figure 4**. The figure shows that from 2000 onwards, the level of median disposable income increased at a lower rate than that of median final income. Final income is obtained by subtracting indirect taxes from disposable income and adding in-kind benefits. The faster growth in the median final income series was driven more by increases in in-kind benefits than by declining indirect taxes.

This implies that the measure of income that one uses to assess economic well-being is very important for the conclusions reached. The same picture emerges from mean analysis too, but the difference between disposable and final income means is much less pronounced. Final income is preferable to other income measures because it includes both labour income and benefits paid in kind. It is therefore used for the following disaggregated household income analysis.

Calculating the ratio of the mean to median income provides further insights into why it may be important to simultaneously consider the two measures. **Figure 5** shows the ratios for original, gross, disposable and final household incomes. The higher the ratio (that is, ratio > 1), the more skewed the income distribution is, meaning that mean income analysis likely gives the impression of a higher level of national economic well-being. The figure shows that the original income ratio increased between 1998 and 2008, but the final income ratio declined during the same period. The difference between the two shows that income distribution in the UK narrowed between 1998 and 2008.

Figure 4 UK median and mean real household disposable and final incomes, 1998–2008

£

Source: Office for National Statistics

Figure 5 Ratio of mean to median real household income in the UK, 1998–2008

Mean: median ratio

Source: Office for National Statistics

The conclusions from the figure are mixed: the final income ratio shows that there has been movement towards more equality in the income distribution and therefore better economic well-being for the 'typical' household. There was also slight progress in the same direction on the basis of disposable income analysis since 2001. However, the original income ratio shows that, over time, there has been growth in inequality. But this is not the preferred measure of income because it does not take into account taxes and benefits.

These results are confirmed by another measure of inequality – the Gini coefficient (Barnard, 2010), which is usually used to complement average income analysis. The Gini coefficient is a measure of the degree of income inequality between different groups of households. It is calculated from the Lorenz curve of household income distribution which plots the cumulative share of household income against the cumulative share of households. The Gini coefficient ranges from 0, representing complete equality (that is, all households having an equal share of the income), to 1, representing complete inequality (that is, one household owning all the income).

Table 3 shows the Gini coefficients of different income variables.

Table 3 **Gini coefficients for all households, 1998–2008**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Equivalised original income	52.7	52.5	51.3	52.6	51.2	51.7	50.6	51.8	51.6	51.7	52.1
Equivalised gross income	38.3	38.3	37.5	39.0	37.1	37.4	36.1	37.3	38	37.5	37.6
Equivalised disposable income	35.0	35.3	34.6	36.0	33.5	33.7	32.3	33.6	34.5	34.2	34.2
Equivalised post-tax income	39.0	39.6	38.9	40.4	37.4	37.8	36.1	37.4	38.6	38.1	37.7

Source: Office for National Statistics

The table shows that the Gini coefficients declined between 2001 and 2004, indicating greater equality, and remained largely stable thereafter. Generally, the Gini coefficient tends to increase (that is, inequality increases) during periods of growth, and it records very small changes during recessions. Similar trends were obtained and published in the Department for Works and Pensions' Households Below Average Income publication (DWP, 2010).

Another way to analyse the income variables is to examine their mean and median income growth rates and compare them to GDP growth. For all income variables, mean and median income growth rates show a downward trend between 1998 and 2008 (see Appendix 1). Median income growth was more volatile than (GDP and) mean income growth. Median income growth was counter cyclical to GDP growth up to 2006/2007, after which both growth rates declined.

Over the past decade, GDP growth was generally higher than the growth in mean and median incomes. Assuming that national income is distributed between workers (wages and earnings) and owners of capital (profits, rents and so on), this may be indication that at national level, the income distribution became increasingly unequal in favour of owners of capital. Under these

circumstances, national economic well-being may not have increased at the same rate as national income as may be implied by GDP analysis.

Disaggregated household income analysis

Further micro data analysis allows for the examination of inter-household distribution issues, which are not discernible from National Accounts data. This section assesses the well-being of households categorised by income level, and again by work status.

Disaggregating household income data by quintile further illustrates the differences in the level of economic well-being between groups (**Table 4**). The table takes the difference between the median and the mean and divides by the median. The result is expressed as a percentage. For the first quintile, the median exceeds the mean, and this was greatest in 1998, 1999 and 2001. This shows that income distribution in this quintile is negatively skewed. This quintile is also the biggest beneficiary of income redistribution. For the second, third and fourth quintiles mean income is greater than median income. This confirms the story already mentioned before. On average, there is greater inequality (larger difference between the median and the mean) in the second quintile, followed by the fourth and third respectively. Compared to the other quintiles, the fifth quintile has the largest difference between the mean and the median, the latter being smaller. This shows that there is greater inequality among households in the top quintile, even though they are better off than the rest. Thus, for the second, third, fourth and fifth quintiles, material living standards of a 'typical' household will be overstated if one uses the mean to measure economic well-being. For the first quintile, median income is greater than the mean, implying that material living standards of a 'typical' household at this point in the income distribution will be understated if one uses the mean to measure economic well-being.

Table 4 Quintile median–mean real income differences, 1998–2008

Year	1 st Quintile	2 nd Quintile	3 rd Quintile	4 th Quintile	5 th Quintile
1998/1999	3.8	-1.4	-1.1	-0.8	-19.5
1999/2000	4.2	-1.5	-0.6	-0.8	-20.4
2000/2001	2.0	-1.1	-1.2	-2.2	-17.5
2001/2002	3.8	-2.0	-1.2	1.1	-24.6
2002/2003	2.7	-2.2	-1.3	-1.9	-16.2
2003/2004	0.8	-1.6	-1.4	-1.4	-21.2
2004/2005	0.7	-1.9	-1.5	-3.2	-16.2
2005/2006	0.7	-2.0	-3.0	-3.2	-16.4
2006/2007	0.6	-3.4	-2.7	-2.3	-19.1
2007/2008	1.0	-2.9	-2.5	-2.5	-16.0
2008/2009	2.3	-1.4	-0.6	-1.1	-16.2

Source: Author's calculations based on Office for National Statistics data

Further disaggregation of LCF data by household work status produces two groups – retired and non-retired households. For both groups, mean income is greater than median income, as shown in **Figure 6**. Again, using mean income to measure material living standards will give the impression of higher economic well-being, but this may not be true. Comparing the means and medians of the two groups shows that the mean and median for the non-retired are greater than those for the retired.

Figure 6 **Equivalised mean and median real incomes of the UK's retired and non-retired households, 1998–2008**

£

Source: Office for National Statistics

Within-group analysis shows that there is greater divergence between the mean and median for the non-retired than for the retired. This indicates that there is greater skewness and hence inequality in the non-retired households' income distribution than in retired households. The lower difference between the mean and median for the latter indicates greater equality. These distributional outcomes are confirmed by disposable income Gini coefficients, as shown in **Table 5**.

The table shows that for non-retired households, the Gini coefficient was nearly constant between 2006 and 2008. The Gini coefficient for retired households was lower, and declined marginally between 2006 and 2008. Overall inequality declined between 2001 and 2004.

In index form, from 2001, the retired households' median income index grew at a faster rate than that for non-retired households until 2008 when the former declined markedly while the latter remained constant. The same applies to mean income. These trends are shown in **Figure 7**.

Table 5 **Equivalised real household disposable income Gini coefficients, 1998–2008**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
All	35	35.3	34.6	36	33.5	33.7	32.3	33.6	34.5	34.2	34.2
Non-retired	34.9	35.2	34.1	35.5	33.4	33.9	32	33.8	34.5	34.2	34.4
Retired	28.1	27.6	28.8	29.2	26.5	25.5	25	25.8	26.9	26.9	26

Source: Office for National Statistics

The deviation of the retired median income index from the non-retired median income index signifies the amount of transfers and benefits paid in kind received by retired households. The transfers and benefits could be in the form of items provided without charge such as television licences and bus passes, and subsidies such as the fuel allowance. The higher demand for health services by retired households also increases the deviation.

Figure 7 **Indices of real final incomes for retired and non-retired households, 1998–2008**

Indices (1998/99 = 100)

Source: Office for National Statistics

Between 2007 and 2008, mean and median final incomes for both retired and non-retired households declined, but marginally so for the latter. The decline was possibly driven by fall in investment income (due to declining interest rates) and new retirees receiving lower pensions (because of the impact of the financial crisis on equity values and the sharp reduction in interest

rates). Increases in council tax and national insurance also reduced household disposable incomes. In comparison to non-retired households, the larger percentage decline in the median final income for retired households, leads to declining economic well-being.

Future work

Despite the discussion about mean and median income in this article, it should be borne in mind that income, at best, indicates the short term status of material living standards and well-being. Income is subject to short term fluctuations, as are living standards, but such fluctuations may be self-correcting over time. This makes income a less appropriate measure of long term material living standards and well-being since it does not capture wealth. To gain insights into the state of long term national economic well-being, it may be important, therefore, to analyse household wealth and income together.

Further, although it is useful to complement mean income analysis with median analysis, there is still lack of information on the nature and structure of intra-household resource receipts and distribution, and how these change with size. These issues have important implications for material living standards and well-being and need to be explored. Current work being conducted by the ONS involves measuring distributions within a National Accounts framework. Finally, the next wave of the ONS's Wealth and Assets Survey should make it possible to jointly analyse household wealth and income.

Conclusion

This article has highlighted the importance of using median income analysis to supplement mean income analysis when examining material living standards and national economic well-being. It uses GDP data as a benchmark, and LIS and LCF data to explore the different pictures shown by mean and median income analyses. Median income is the income available to the household in the middle of the income distribution; thus it represents the standard of living of the 'typical' household. It has been shown that in most instances, median income is lower than mean income, and that rising inequality causes median income to lag behind mean income. The latter is influenced by high values at the top of the income distribution, thus giving an impression of high living standards even though this may not be the case. It has been argued that, under these circumstances, mean analysis needs to be complemented with median analysis in order to get a more informed picture of the standard of living. It has been acknowledged that each average measure has strengths and weaknesses, and that, depending on the distribution of income, relying on any one of measure may result in wrong conclusions about living standards and economic well-being.

The article has argued that household income data at the micro level give an enhanced picture of the state of household economic well-being than National Accounts data because the former can be equivalised and can easily indicate the 'typical' household. Using various measures of household income, it has been shown that one needs to be careful in choosing and interpreting mean and median income data. It has been argued that, compared to other income measures, final

income has the advantage that it takes into account the receipt of benefits paid in kind which have an important impact on material living standards and well-being, especially for retired households. Further, inequality analysis using the Gini coefficient showed that inequality declined between 2001 and 2004 and stabilised thereafter, a result confirmed by the mean to median ratios of disposable and final incomes.

It has been shown that economic recession resulted in both mean and median final income declining. The decline was more marked for retired than non-retired households, in part because of declining returns to investments and reduced pension entitlements to the retiring. The Gini coefficient for non-retired households has been shown to be higher, while that of retired households is lower and declined marginally towards the end of the study period. Quintile analysis also showed that mean and median income analyses may have different standard of living implications for the first and second, and the fourth and fifth quintiles. Such difference can only be shown using household rather than National Accounts data, with more knowledge gained from supplementing mean analysis with median analysis.

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Notes

1. The standard method used by both UK and international studies is now the modified-OECD equivalisation scale as discussed in Anyaegbu (2010).
2. Purchasing power parity (PPP) is the theory that estimates the exchange rates between national currencies in long-term equilibrium when their purchasing power is the same in each of the countries. The PPP exchange rate will thus be equal to the ratio of the countries' price level of a fixed basket of goods and services.
3. Only seven countries have been chosen because of their close economic links with the UK, and to avoid congesting the graph. The countries also clearly illustrate the points discussed.
4. Other measures are sometimes used to measure standard of living, including health (access and quality), education standards, and income inequality. Composite measures like the Human Development Index can also be used.
5. These are the years for which latest data is available for the countries.
6. The absolute GDP and household income values are not directly comparable because the disposable income estimates have been divided by the square of the household size, whereas the

GDP figures by just the population. However, focus here is on their implications for well-being between countries.

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Annex: Equivalised real household income (£), 1998/99-2008/99

	Orig. median	Orig. mean	Gross median	Gross mean	Disp. median	Disp. mean	Post median	Post mean	Final median	Final mean
1998/99	18,559	23,222	21,512	27,557	17,704	21,903	13,593	17,441	17,340	20,800
1999/00	19,241	24,285	22,610	28,781	18,765	22,933	14,432	18,319	18,309	21,921
2000/01	20,535	25,298	23,531	29,780	19,246	23,719	14,960	18,883	19,048	22,673
2001/02	20,584	26,641	24,118	31,268	19,927	24,882	15,687	20,243	20,269	24,340
2002/03	21,165	26,326	24,705	31,229	20,755	25,184	16,564	20,435	21,448	24,905
2003/04	21,272	26,834	25,057	31,837	20,841	25,409	16,494	20,603	21,871	25,372
2004/05	21,905	27,262	25,816	32,457	21,433	25,919	17,198	21,120	22,842	26,190
2005/06	21,866	27,814	25,983	33,161	21,392	26,421	17,214	21,605	23,261	26,873
2006/07	22,711	29,083	26,661	34,269	21,935	27,122	17,558	22,234	23,519	27,509
2007/08	22,820	28,696	26,877	34,060	22,079	26,964	17,828	22,241	23,984	27,631
2008/09	21,785	28,159	26,128	33,645	21,858	26,899	18,015	22,440	23,279	27,228

Definitions

Orig. mean = original income – mean;

Gross mean = gross income – mean;

Disp. mean = disposable income – mean;

Post mean = post-tax income – mean;

Final mean = final income – mean;

Orig. median = original income – median

Gross median = gross income – median

Disp. Median = disposable income – median

Post median = post-tax income – median

Final median = final income – median