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# Beyond GDP

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# Beyond GDP

## *“Launch Version”<sup>1</sup>*

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Prepared for the Growth Commission

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<sup>1</sup> **PRELIMINARY VERSION—Not to be quoted or cited. This paper was produced by the Growth Commission’s Secretariat to inform the thinking of the Commissioners. The analysis does not necessarily reflect the views of the Commissioners. In contrast, the proposals are those of the Growth Commission report.**

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*The views expressed here do not necessarily reflect the views of the individuals or institutions mentioned above.*

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## 1. Introduction

Discussions about economic growth typically centre on changes in the Gross Domestic Product (GDP) of a country. GDP measures production and it is important for several reasons. For example, to guide macroeconomic policies<sup>2</sup>, to account for productivity and because it is intrinsically linked to the volume of other variables such as employment. However, it is not a *direct measure* of living standards, meaning that GDP (or GDP per capita) improvements might not reflect gains experienced by a representative part the society.

A representative growth measure of material well-being shall reflect changes in the *material living standards* of a *typical* group in a country, and GDP fails both points. Firstly because we should analyse changes in measures of *income*, *consumption* and *wealth* instead of measures of *production*, since they are the relevant variables for the material well-being of individuals. Secondly, because GDP (or more precisely GDP per capita) is an average measure and there are better indicators for what a typical household (or individual) in the society experiences. This last point shall become more clear in the next section.

Additionally, GDP is a gross measure and does not take into account taxes or depreciation. These aspects affect the living standards and should be considered when analysing growth. If a significant part of production moves towards capital replacement rather than consumption, then society is not fully benefiting from GDP growth. The argument for taxes is similar, i.e., if GDP increases together with a raise in taxes, then it is possible that living standards remain unchanged.

In this report we propose that for the purpose of evaluating material living standards, much greater emphasis should be given to changes in median equivalised disposable household income (or simply Median Income). We argue that this measure accounts for some of the GDP disadvantages and, hence, better represents what a typical household experiences. This recommendation is based on Stiglitz et al. (2009), henceforth denominated The Stiglitz Report.

Distributional issues and non-material well-being are also an important part of the analysis of living standards. Although not the main focus of this paper, we recognize these issues and dedicate Sections 3 and 4 to briefly describe an income measure that internalises distributional issues not captured by Median Income and to highlight some core dimensions of non-material well-being. In the last section we offer some comments about societies capacity to sustain well-being over time, i.e., sustainability.

## 2. Proposed Measure: Median Equivalised Disposable Household Income

Given the issues exposed in the previous section, it should not be surprising that there are better measures available to evaluate changes in the material well-being of a country. As recommended by The Stiglitz Report, we think a good candidate is the median equivalised disposable household income, henceforth denominated Median Income.

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<sup>2</sup> See European Central Bank (2012) for a discussion on monetary and fiscal policies.

It is an (net) income measure and, hence, better reflects changes in material living standards of the society than (gross) production. Additionally, it is based on the median (and not on the average), a moment of the distribution more closely connected to what typical individuals (or households) experience in a country as mentioned in The Stiglitz Report.

Another advantage of Median Income is the fact that it is an equivalised household measure. Considering households instead of individuals internalizes that people generally live together in households and not as single individuals. And equivalisation implies that it is adjusted so that households with different sizes and compositions can be compared in a reasonable manner.

Equivalence scales take a family configuration as a reference point. Income of larger households is adjusted downwards while income of smaller ones is adjusted upwards. Examples of equivalisation scales are the McClements and the Modified-OECD (used in our analysis). See Appendix B for details about the scales.

Median Income also *includes* values for benefits in kind received by a household, especially those services provided by the government, like health and education.

Our analysis is based on income series provided by the Office for National Statistics (ONS) and used on their annual report about the effect of taxes and benefits on household income<sup>3</sup>. These series are derived from the Living Costs and Food Survey. There are also other possible series available<sup>4</sup>.

ONS does not produce an equivalised income series including benefits in kind (Median Income). They argue that equivalisation scales are not appropriate for such values because expenses like health and education do not have significant economies of scale. On the other hand, other papers considered by OECD in their analysis (Fesseau and Laidier, 2010) equivalise monetary values for benefits in kind. We follow this last approach and calculate Median Income based on available ONS' income series<sup>5</sup>.

Figure 1 shows GDP per capita and Median Income growth over time. The two measures are expressed as indexes. The index value minus one gives the cumulative growth rate for the period. For example, 1.4 means that the variable grew 40 per cent along the period ( $1.4 - 1 = 0.4$ ). See Appendix A for the level of the variables.

We can see that Median Income grew slower than GDP per capita in the late eighties and around the mid 2000's. The income uprising in the middle of the last crisis is due mainly to the benefits in kind component of income. Hence, a typical household in the UK didn't experience as much income growth as someone would infer by looking solely at GDP per capita. Cribb, Joyce and

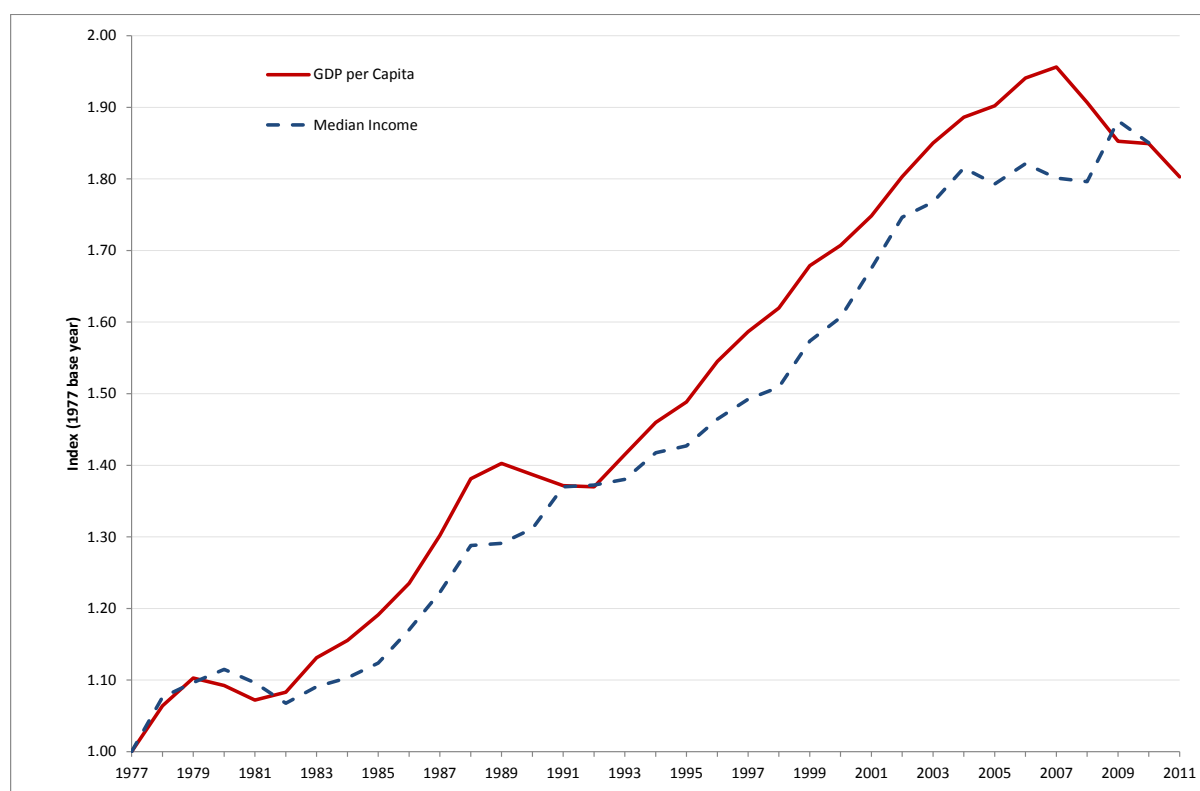
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<sup>3</sup> See Office for National Statistics (2012a), for example.

<sup>4</sup> There is also one Median Income series (that does not include some measures of benefits in kind) sponsored by the Department for Work and Pensions (DWP) and used in the annual publication "Household Below Average Income". This series is based on the Family Resources Survey now, and was based in the Family Expenditure Survey in the past.

<sup>5</sup> Even though our Median Income series is not produced regularly by ONS, they kindly generated it for this report.

Philips (2012) find a similar trend<sup>6</sup> for Median Income using a combination of the Family Resources Survey and the Family Expenditure Survey.



**Figure 1: Real Median Income and GDP per capita indexes**

Variables are deflated by the retail price index (RPI).

Income equivalised using Modified-OECD scale (household with 2 adults as the reference).

From 1994 onwards Median Income based on UK financial year rather than on calendar year (for example, 1994 corresponds to fiscal year April 1994 – March 1995).

Source: ONS

Although these series are more informative than GDP in terms of material well-being, they are not perfect measures. Timely release is a clear disadvantage. These measures are based on household surveys that need time to be processed (both the reports Department for Work and Pensions, 2012, and Office for National Statistics, 2012a for the 2010/2011 period were released on June 2012). On the other hand, GDP figures are released within months.

Jenkins (2012) suggests two ways of obtaining more timely releases of Median Income figures: (i) to invest more on resources and personnel to shorten the gap between the conduction of the surveys and the release of the final series; (ii) to rely more on modelling and imputation (something also used in preliminary estimates of GDP), which would imply making use of micro-simulation models based on less up-to-date information to forecast for a short upcoming period (or “nowcast”) the median before the surveys become available.

Another weak point is the lack of international standards to guide Median Income (such as the ones that guide GDP and make its value comparable across countries). Even though OECD and

<sup>6</sup> Their analysis does not consider values for most types of benefits in kind and, hence, their series looks more like our Median Income series unadjusted for benefits in kind shown in Appendix A.

Eurostat<sup>7</sup> are making effort in this direction, we are still far away from a worldwide standard similar to the GDP one.

### 3. Inequality

The Stiglitz Report also recommends to give more prominence to the distribution of income consumption and wealth. This would allow us to analyse not only a typical household but also bottom and top income earners. It would also permit us to see what is happening to inequality in the UK, something that has become an increasingly important issue since the late seventies, as pointed out by several authors. For example, Van Reenen (2011) shows that *wage inequality* has increased not only in the UK but also in other OECD countries. Cribb, Joyce and Philips (2012) find that *income inequality* increased along this period in the UK.

Even though we can have a flavour of what is happening with the income distribution (and inequality) when we analyse median and average measures together<sup>8</sup>, it is important to bear in mind that Median Income *alone* does not take into account distributional issues. Hence, other measures are necessary.

Based on this last recommendation of The Stiglitz Report, Jenkins (2012) and Atkinson (2011) propose a distributionally-sensitive measure of national income based on Sen (1976). This measure can be written as the product of real mean income and the GINI index of inequality (that lies between zero and one and it is increasing in inequality, implying that the income measure is decreasing in inequality). Jenkins (2012) points out that inequality-adjusted income grew slower than the unadjusted one in the UK since the early eighties .

### 4. Non-Material and Subjective Well-Being

Well-being is multi-dimensional. Therefore, looking at Median Income and GDP will not be sufficient to evaluate all aspects affecting living standards. Other important components shaping individuals' quality of life are health, education and environment.

Health is a fundamental to analyse society's quality of life. Therefore, reliable statistics about mortality and morbidity rates are necessary. Although not as up to date as the income measures, the Office for National Statistics provides information on both points (see Beaumont and Thomas, 2012) .

It is well known that education is an important way of providing the competencies needed to foster economic growth. But education also increases well-being per se. According to The Stiglitz Report, many works associate better educations with better health status and lower

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<sup>7</sup> OECD has a project to use micro-information on income distribution to calculate median household income that will be internationally comparable. It encompasses 20 pilot countries and the first results shall be available by the end of 2012. Eurostat makes available international series for median household income in some countries. For details of the Eurostat progress, see the Eurostat (2011).

<sup>8</sup> Figure 1 above shows that Median Income grew slower than GDP per capita in the late eighties and around the mid 2000's. This is an indication that inequality increased in these periods.



unemployment, for example<sup>9</sup>. Some education indicators refer to input (e.g. educational expenditure) while others refer to outputs (e.g. graduation rates). Many sources of data are available to obtain such indicators, like the National Pupil Database (provided by the Department for Education)<sup>10</sup>.

Environmental conditions have an immediate impact on society's well-being. It affects human health, people's choices (since environmental amenities and disamenities are valued by the society), and environmental imbalances may lead to natural disasters such as floods and droughts. Many indicators can be used to measure the state of environmental quality (see Office for National Statistics, 2012c), but they are still limited in measuring the quality of life perspective<sup>11</sup>.

It is also worth pointing out that subjective measures of well-being need also to be considered. This type of measure directly reveals individuals' perceptions about life satisfaction and, hence, avoid "paternalist" assumptions of the type that attribute objective counterparts to life satisfaction without further consultation (like all the measures discussed previously). According to Layard (2005), there are sophisticated ways of measuring how satisfied (or happy) people are and these measures shall be of use to policy makers.

Finally, as highlighted in Section 3, distributional issues matter not only to income but also to non-material well-being. It is important to account for inequalities in individuals' conditions (and not only for average ones). A further challenge is to address the links between the various dimensions of well-being, something that is difficult to measure but is extremely important to guide policy decisions.

## **5. Sustainability**

All the aspects discussed previously are fundamental not only to analyse present well-being but also sustainability, which is the capacity to increase (or at least sustain) well-being over time. The Stiglitz Report recommends that sustainability should be measured separately from present well-being. This implies that the wealth (or stock-based) approach should be used, something that is based on the principle that future well-being depends on the magnitudes of the stocks of resources passed on to future generations. Generally, these stocks include exhaustive and renewable natural resources, and physical and human capital. Hence, sustainability measures should be targeting these stocks (or at least changes in these stocks).

One alternative to measure sustainability is to aggregate the many stocks according to one common metric (usually a monetary value), compiling one single stock of assets that affect the sustainability of a nation. This approach simplifies the final analysis, but relies on relatively implausible assumptions such as perfect substitutability between different types of assets (e.g. oil reserves and human capital), and is limited by the absence of markets for all types of stocks that needed to be aggregated (e.g. quality adjusted water availability).

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<sup>9</sup> And this is true even after controlling for the additional income higher education brings.

<sup>10</sup> See Office for National Statistics (2012b).

<sup>11</sup> An example of such limitation is that we should measure how many people are exposed to some pollutant and not simply its quantity in the air.

Dashboards (or set of indicators) are another alternative to assess sustainability. It possesses the advantage of separately keeping track of the many heterogeneous stocks affecting it, avoiding the difficult task of summarising them into a single metric. Nevertheless, this advantage may easily turn into a disadvantage arising from the complexity of analysing a large and eclectic dashboard. Therefore, a limited dashboard looks like an optimal solution.

Following the last recommendation of The Stiglitz Report, the final dashboard should combine: i) a monetary indicator that accounts for the economic aspect of sustainability and aggregates stocks for which reasonable valuation techniques exist (such as some natural resources and human and physical capital); ii) a set of physical indicators for environmental pressure. A possible dashboard, suggested by UNECE/OECD/Eurostat (2008) is given in Table 1:

Indicator Domain	Stock Indicator	Flow Indicator
<b>Foundational Well-being</b>	Health-adjusted life expectancy	Index of changes in specific mortality and morbidity (place holder)
	Percentage of population with post-secondary education	Enrolment in post-secondary education
	Temperature deviations from Normals	Greenhouse gas emissions
	Ground-level ozone and fine particulate concentrations	Smog-forming pollutant emissions
	Quality-adjusted water availability	Nutrient loading to water bodies
	Fragmentation of natural habitats	Conversion of natural habitats to other uses
<b>Economic Well-being</b>	Real per capita net foreign financial asset holdings	Real per capita investment in foreign financial assets
	Real per capita produced capital	Real per capita net investment in produced capital
	Real per capita human capital	Real per capita net investment in human capital
	Real per capita natural capital	Real per capita net depletion of natural capital
	Reserves of energy resources	Depletion of energy resources
	Reserves of mineral resources	Depletion of mineral resources
	Timber resource stocks	Depletion of timber resources
	Marine resource stocks	Depletion of marine resources

**Table 1: Sustainability Dashboard Economic well-being measures should be aggregated into one (monetary) measure.**

**Source: The Stiglitz Report, UNECE/OECD/EUROSTAT (2008)**

The World Bank produces statistics regarding the first point above, while the Department for Environment, Food and Rural Affairs (Defra) produces a dashboard composed by various indices of sustainability recognised as leading edge. Obviously, a difficulty not addressed by these indicators is the global aspect surrounding sustainability, given that actions taken abroad might affect UK's aspects and vice-versa.

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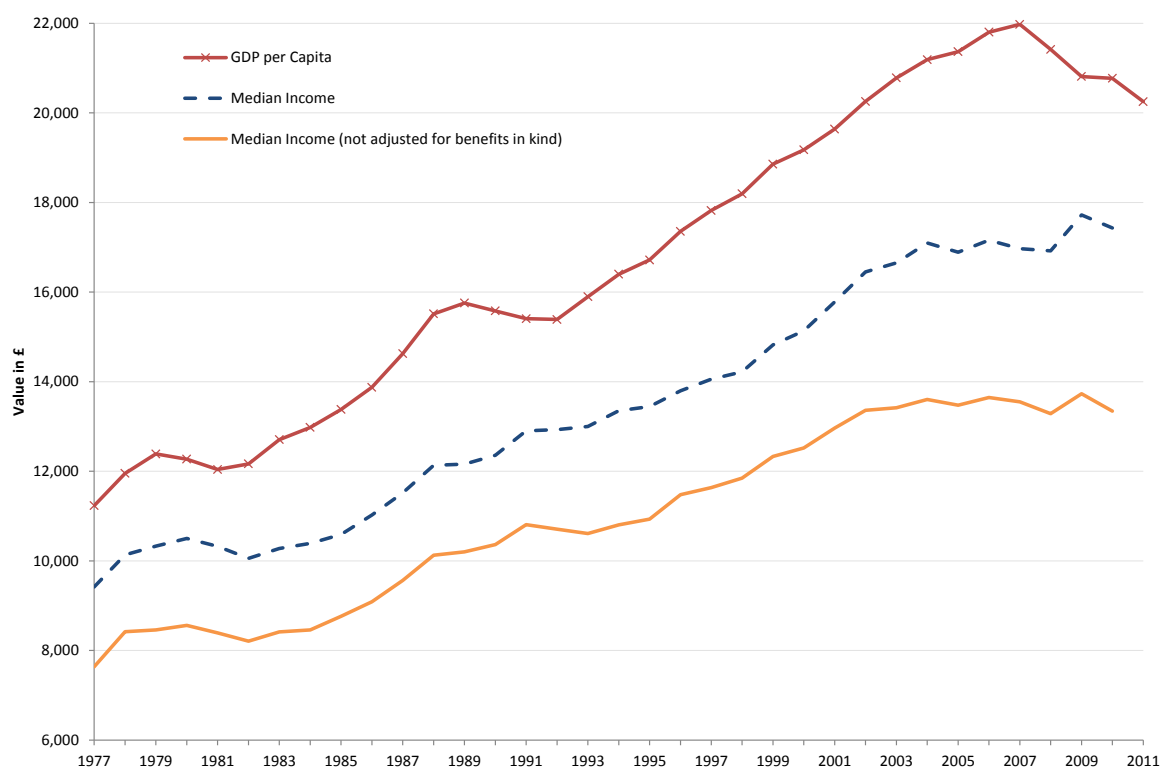
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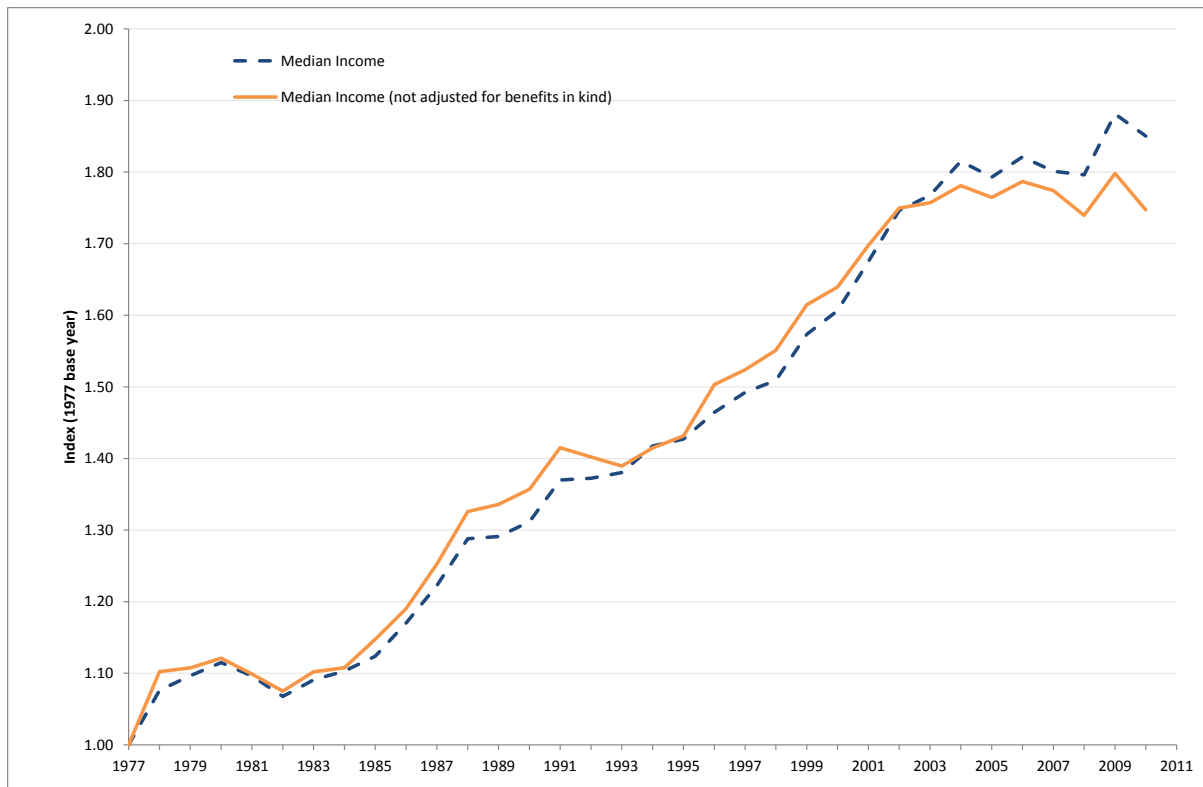
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## **Appendix A: Levels of Median Income and GDP per Capita**



**Figure 2: Real Median Income and GDP per capita deflated by the retail price index (RPI) in 2005 prices. Income equivalised using McClements scale until 2010 and Modified-OECD for 2011. Original data from ONS rescaled (using Modified\_OECD scale values) such that household with one adult is the reference. From 1994 onwards Median Income based on UK financialyear rather than on calendar year (for example, 1994 corresponds to fiscal year April 1994 – March 1995). Source: ONS**



**Figure 3: Real Median Income indexes.**

Variables are deflated by the retail price index (RPI).

Income equivalised using Modified-OECD scale (household with 2 adults as the reference).

From 1994 onwards Median Income based on UK financial year rather than on calendar year (for example, 1994 corresponds to fiscal year April 1994 – March 1995).

Source: ONS

## Appendix B: Median Income Concepts

This appendix is a summary of the Median Income definitions explained thoroughly in Office for National Statistics (2012).

Median Income equals to:

$$\text{Median Income} = \text{Original Income} + \text{Cash Benefits} + \text{Tax Credits} + \text{Benefits in Kind} - \text{Direct Taxes}$$

Where:

### Original Income

Is equal to annualised income in cash of all members of the household before the deduction of taxes or the addition of any state benefits. It includes income from employment, self-employment, investment income, fringe benefits (such as company cars, private medical

insurance and beneficial loans), private pensions and annuities which include all workplace pensions, individual personal pensions and annuities.

### Cash Benefits

Cash benefits and tax credits include:

1. Contributory benefits: State pension, contribution based job seeker's allowance, incapacity benefit, widows' benefits, and statutory maternity pay.
2. Non-contributory: Income support, income based job seeker's allowance, child benefit, housing benefit (council tax benefit and rates rebates are treated as deductions from council tax and Northern Ireland rates), statutory sick pay, carer's allowance, attendance allowance, disability living allowance, war pensions, severe disablement allowance, industrial injury disablement benefits, child tax credit and working tax credit, pension credit, over 80 pension, Christmas bonus for pensioners, government training scheme allowances, student support, and winter fuel payments.

### Direct Taxes

Income tax, council tax and Northern Ireland rates, and employees' and self-employed National Insurance contributions are grouped as direct taxes. Taxes on capital, such as capital gains tax and inheritance tax, are not included in these deductions because there is no clear conceptual basis for doing so, and the relevant data are not available from the Living Costs and Food Survey.

### Benefits in Kind

Benefits in kind include National Health Service, state education, school meals and healthy start vouchers (including nursery milk), housing subsidy, railway travel subsidy, bus travel subsidy (including concessionary travel schemes).

### Equivalisation Scales

The Modified-OECD equivalisation scale attributes different weights to each household member (1 to the first adult, 0.5 to subsequent adults and to children aged 14 and over, and 0.3 to children aged 13 and under). The values of the individuals are added giving an equivalence number for the household that will be used to divide the household income, resulting in the equivalised income. For example, a household composed by a married couple and three children under 13 with an annual income of £ 48,000, will have an equivalised income of  $48,000 / (1 + 0.5 + 3 \times 0.3) = 20,000$  pounds.

The McClements scale is similar, also possessing a household with two adults as the reference point but assigning different numbers to other members of the household when compared to the Modified-OECD scale. For more details, see Anyaegbu (2010).

In order to compare Median Income and GDP per capita levels in Appendix A, we rescale the income values using the Modified-OECD scale such that a household with one individual is the new reference. This does *not* affect the growth rates shown in Figure 1 and 3.