MEETING OF THE OECD COUNCIL
AT MINISTERIAL LEVEL, PARIS
6-7 MAY 2014

REPORT ON THE OECD
FRAMEWORK FOR

INCLUSIVE GROWTH

OECD
BETTER POLICIES FOR BETTER LIVES

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EXECUTIVE SUMMARY

Economic growth is not an end in itself; more is needed to address multidimensional challenges.

Pro-growth policy analysis and advice have conventionally focused on options for improving the population's income and consumption possibilities. Emphasis is placed on supply-side instruments, or policy actions that can lead to an increase in the per capita output of goods and services over the longer term, with progress measured essentially at the level of an "average" individual. Pro-growth policies have the potential for making all citizens better off materially, generating resources that can be used to achieve social goals and ensure that growth is maintained over the long term. Appropriate combinations of policies and institutional settings are identified to improve the performance and long-term output potential of economies, taking into account country-specific needs and circumstances, including the level of development and institutional capacities.

However, there is growing awareness of the importance of recognising the effects of policies on different social groups. Widening income disparities over the last three decades in most OECD countries have drawn attention to the need for going beyond the "average" individual or household when gauging the success of pro-growth policies among population groups that can be highly heterogeneous (Box 1). Indeed, persistent unemployment among certain socio-demographic groups, such as women, youth and immigrants, as well as rising relative poverty since the crisis, have underscored a multitude of policy challenges that need to be addressed. Also, rising inequality of opportunities suggests that policies that aim to address inequality of outcomes will fail unless they ensure more equal access to high-quality education, health care and infrastructure, which remain unevenly spread among social groups and across regions and places within many countries.

Box 1. Trends in inequalities

Income disparities have been widening in most OECD countries, including in traditionally egalitarian ones. The average income of the richest 10% is now about 9.5 times that of the poorest 10% on average in OECD countries, up from 7 times 25 years ago (OECD, 2013a). In Germany, Norway and Sweden, the gap between rich and poor has expanded from less than 5 to 1 in the 1980s, to more than 6 to 1 today (OECD, 2013a).

However, income gaps are narrowing, albeit from very high levels, in some developing countries and emerging market economies. This is the case in Mexico and Chile; but the ratio between the richest 10% and poorest 10% still stands at approximately 27:1 in these countries. Brazil considerably reduced the rich-poor income gap but it is still 50:1. And in South Africa, inequality has continued to rise and now it is over 100:1 (OECD, 2011a).

Income gains have accrued to top earners. Over 1976-2007 the top 1% of the income distribution has benefitted disproportionately from greater income growth. In the United States 47% of total income growth over 1976-2007 went to the top 1%, in Canada it was 37%, and the figure stood at around 20% in New Zealand, Australia and the United Kingdom (OECD, 2014a, forthcoming).

Inequality goes beyond income, and better educated people live longer. Data from 15 OECD countries show that on average people with better education live 6 years longer than their poorly educated peers (OECD, 2013d)

Access to jobs is also unequal, perpetuating income discrepancies. Non-standard work arrangements make up 33% of total employment across OECD countries (OECD, 2014b). In-work poverty now affects 8% of the workforce in OECD countries (www.oecd.org/social/income-distribution-database.htm).

Increases in income and consumption do not necessarily translate themselves into sustained improvements in well-being. Indeed, OECD work shows that a host of non-income dimensions matter for people's subjective perception of life satisfaction, despite differences across countries in levels of income of the population as a whole and institutional settings. Health and educational status, employment conditions and other aspects of life can affect subjective well-being more than income. Non-income dimensions are important because they also stand for opportunities and choices that matter for people's participation in economic life and society. For instance, good health improves subjective well-being but is also a pre-condition for participating in the labour market and benefiting from social relationships. Similarly, being well integrated in the job market provides a sense of accomplishment and contributes to life satisfaction over and above financial rewards. Pro-growth policy actions that can deliver improvements in outcomes along all these dimensions, as well as raising material living standards, would therefore go a long way in fostering economic performance and enhancing the well-being of the population.

Multidimensionality, attention to distributional considerations and policy relevance are therefore the three key pillars of a policy framework for Inclusive Growth. For the reasons highlighted above, and while still regarding economic growth as an important means to an end, the policy debate can place increasing emphasis on the drivers of subjective well-being and the policies that can create opportunities for all segments of the population and distribute the dividends of increased material prosperity fairly across society. This policy framework can build on OECD work on: (*i*) well-being, which highlights the importance of multidimensionality in policy analysis; (*ii*) income distribution, which identifies the policies levers for dealing with income inequalities; and (*iii*) pro-growth structural reforms, which point to areas where growth-friendly and pro-inclusiveness policies can reinforce each other. In doing so, this framework can better inform the policy debate about the synergies, trade-offs and unintended consequences of policy actions on the basis of a richer, broader panoply of policy indicators and dimensions of well-being. The framework also allows for gauging policy impacts for different social groups, such as households with average, median or low incomes.

Multidimensional living standards have improved faster than GDP per capita, despite widening income inequality

Measures of "multidimensional living standards" can be used to complement GDP per capita when assessing the outcomes of pro-growth policies. For example, attention can be placed on changes in unemployment and longevity to capture key non-income dimensions that matter for people's well-being: jobs and health. Together with household disposable income, a measure of "multidimensional living standards" can be computed, aggregating these three dimensions. In particular, when applied to OECD countries over the period 1995-2007, calculations show that:

- Multidimensional living standards rose faster than GDP per capita in the decade running up to the crisis. For the average household in the OECD area, living standards rose by 3.9% per year compared to a 2.3% rise in average GDP between 1995 and 2007. This is due to rising household incomes, as a result of robust GDP growth in the run-up to the crisis, but also falling unemployment and improvements in health conditions (rising longevity), which are important for well-being.

- The rise in multidimensional living standards was somewhat weaker for median households (those with income at the middle of the distribution) and for the poor (those households with income at the lowest decile of the distribution), at 3.8% and 3.6%, respectively, than for the "average" (mean) household. These findings show that widening income inequality affected the poorest households most adversely.

- The trend of rising multidimensional living standards changed significantly as the crisis set in. In the most affected countries, such as Spain, Greece or Ireland, the multidimensional living standards of the median household dropped by a significant margin more than GDP per capita during 2007-10, reflecting in particular a loss in welfare due to rising unemployment and income inequality.

Does inequality matter?

Inequality of opportunity, rather than outcomes, is particularly detrimental to growth and well-being. Rewarding hard work and skills entails a certain degree of income inequality, but it may be good for economic growth, as long as all citizens have equal access to high-quality education, health care, and other public goods and services, as well as finance and other drivers of entrepreneurship. In this case, some level of inequality of outcomes is not only economically inevitable but also politically acceptable. However, inequality of opportunities can be particularly damaging, because it locks in privilege and exclusion, which undermines intergenerational social mobility and weakens incentives to invest in knowledge and, in turn, holds back potential growth. Indeed, taking into account cross-country differences in social attitudes towards income inequality, continually rising inequality cannot be disregarded, especially if it is associated with rising barriers to full participation in economic and social life by the most disadvantaged members of society.

Structural reforms can indeed have different effects on GDP and household income, as well as for different social groups

The effects of policies on multidimensional living standards have yet to be fully gauged, but preliminary analysis regarding the income dimension of well-being points to different impacts on GDP per capita and household disposable income. GDP per capita and average household disposable incomes tend to move in parallel, at least over sufficiently long periods. But specific pro-growth structural policies affect GDP per capita and household disposable incomes differently, with different effects for different social groups along the distribution of income. Evidence for OECD countries and selected structural reforms over the period from the mid-1980s to 2010 illustrates these different effects. For example:

- Reforms to reduce regulatory barriers to domestic competition, trade and inward foreign direct investment can lift the incomes of the lower-middle class by more than it does GDP per capita or average household income.

- Conversely, a tightening of unemployment benefits for the long-term unemployed, if implemented without accompanying measures, such as a strengthening of job-search support and other activation programmes, may lead to a decline in the income of the lower-middle class, even if it boosts average income.

A full analysis of policy packages for Inclusive Growth requires going beyond income and assessing the effects of structural policy on non-income dimensions

It is possible to gauge the effects of structural policies on multidimensional living standards. As noted above, it is important to gauge the effects of structural policies on different social groups, such as the middle class ("median" households) and the poor (households with incomes in the low deciles of the income distribution). But it is also important to inform the policy debate by providing evidence on the policy determinants of multidimensional living standards, including the effects of specific actions on jobs and the population's health status. Certain structural policies may not be immediately beneficial for GDP growth and possibly median household income (for instance, increased tax-financed health care expenditure), but they may yield health benefits that ultimately contribute to productivity and economic

growth. Other structural policies that have an immediate bearing on the income and employment prospects of a majority of households are particularly desirable, as they positively affect two important dimensions of well-being: income and jobs. These multidimensional effects remain to be worked out more systematically. Their assessment is crucial for valuing trade-offs and synergies from structural policies.

Options can be considered for gradually strengthening the policy framework for Inclusive Growth. They include broadening the range of non-income dimensions that are known to affect subjective well-being and better understanding the linkages between policies and outcomes along the various dimensions that matter for the computation of multidimensional living standards. Indeed, several "policy transmission channels" are already well known, including how changes in tax-benefit systems affect GDP per capita and household income through their effects on labour force participation. Likewise, the growth effects of innovation policies are well understood through their impact on labour productivity, but the effects of these policies on health, for example, deserve further investigation. It is also important to complement the analysis with sector-specific insights and to reflect the circumstances and needs of specific countries, including developing countries and emerging market economies.

OECD FRAMEWORK FOR INCLUSIVE GROWTH

Introduction

Inclusive Growth deals with the idea that economic growth is important but not sufficient to generate sustained improvements in welfare, unless the dividends of growth are shared fairly among individuals and social groups. At the same time, there is increasing recognition that, in addition to income and wealth, people's well-being is shaped by non-income dimensions, such as their health and education status. The level and distribution along these non-income dimensions are therefore key aspects of Inclusive Growth, making it a multidimensional concept. Moreover, to be relevant Inclusive Growth needs to be policy-actionable, allowing policy makers to better understand the trade-offs and complementarities that exist across policy areas and the tools that can be used to achieve improvements in both the level and distribution of income and non-income outcomes. This is why it is important to consider the various dimensions of Inclusive Growth simultaneously and not one by one.

Motivation for OECD work in Inclusive Growth comes from a variety of recent and secular trends that are shaping the outlook for policies in OECD member and partner countries. Inclusiveness of economic growth has been at the heart of many debates on development and poverty,[1] but it has also surfaced in countries where economic growth has been accompanied by increasing income inequality over the last 30 years or so (OECD, 2008a; 2011a). The rise in unemployment since the crisis, especially among youth, has further underscored the need for a better understanding of the policies that are needed to improve labour market outcomes across different social groups, especially those with weakest attachment to the labour force, such as women and youth. Moreover, in a situation of severe fiscal stress in many countries, governments are faced with the challenge of safeguarding the provision of social services while preparing for population ageing and other trends that will put increasing strain on national budgets in the years to come. In many emerging market economies, demands for social entitlements and access to more and better services will also put an increasing burden on national budgets and call for cost-effective solutions.

Inclusive Growth builds on different strands of OECD work. In particular:

- The *multidimensionality* that is at the heart of Inclusive Growth has been a defining feature of the OECD's work on well-being (OECD, 2011b), which identifies health and education outcomes, social connections, personal security, work-life balance, environmental quality of life and subjective well-being as important non-income aspects of well-being (see also Stiglitz, Sen and Fitoussi, 2009).

- The emphasis placed in Inclusive Growth on *distribution* builds on OECD work on the analysis of trends and drivers of income inequality in OECD member and selected partner countries, not least in *Divided We Stand* and related work,[2] as well as on the evolution of non-income outcomes across individuals and social groups in OECD work on well-being.

- The *policy orientation* of Inclusive Growth builds on OECD work such as *Going for Growth* that analyses the policy levers for raising GDP per capita, and various strands of OECD work on

[1] In the development context, the discussion has related to 'Pro-poor growth'. For relevant concepts and policy messages, see in particular Klasen (2005), Ravaillon (2004) and OECD (2006).

[2] See, for instance, Verbist, Förster and Vaalavuo (2012), Immervoll and Richardson (2011), OECD (2011a).

labour markets, health and education policies, innovation and entrepreneurship, and regulation, among others.

The OECD project on Inclusive Growth develops a measure of "multidimensional living standards" that accounts for selected non-income dimensions of well-being and their distributional aspects. It also develops a framework for assessing the role of policies in promoting Inclusive Growth. Section 2 starts by defining Inclusive Growth on the basis of the measure of multidimensional living standards. The work at hand proposes *risk of unemployment* and *health status* as the non-income dimensions to be considered along with *household income* for the computation of multidimensional living standards. Thus, inclusiveness is captured by relating to three (income, jobs, health), rather than just one, dimensions of well-being and by taking into account distributions of outcomes along these dimensions across different population groups. The section presents a first set of results based on these three dimensions and for households with income at the mean, median and lower decile of the distribution. The proposed approach could be generalised to include additional dimensions (e.g. education, environment) or to focus on broader set of social groups to better capture the notion of Inclusive Growth in a larger group of low and middle-income countries.

Section 3 sets up a framework to assess the links between Inclusive Growth and the policies bearing on them. It provides a simple example with income and one non-income determinant of Inclusive Growth. The large body of OECD work on effects of structural policies on income growth is instructive in this respect, although the bulk of existing evidence relates to the effects of policies on average GDP growth, rather than on Inclusive Growth.

The note concludes by proposing directions for future work. Some of the concepts and empirical results reported in the previous sections are preliminary and aim to illustrate the basic concepts, rather than providing a final analysis of the policy drivers of Inclusive Growth, which will need to be developed over time. There are also data gaps that will only be filled successively and that could well change results.

1. Inclusive growth: concept and measurement

1.1. Defining multidimensional living standards

The OECD policy framework for Inclusive Growth aims to gauge the benefits of economic growth, how they are distributed among social groups, and how policies and institutions affect them. In so doing, the OECD framework complements the approaches towards defining and measuring Inclusive Growth that have been used by other international organisations (Box 2).

Box 2. The definition of Inclusive Growth in the work of other International Organisations

The **World Bank** refers to Inclusive Growth to denote both the pace and pattern of economic growth, which are interlinked and assessed together. In the World Bank approach, rapid pace of economic growth is necessary for reducing absolute poverty. But, for this growth to be sustainable in the long run, it should be broad-based across sectors, and inclusive of the large part of a country's labour force. This definition implies a direct link between the macro and micro determinants of growth. In this perspective, Inclusive Growth focuses on *productive* employment, rather than on employment per se, or income redistribution. Employment growth generates new jobs and income, while productivity growth has the potential to lift the wages of workers and the returns of the self-employed. The World Bank's approach adopts a long-term perspective and is concerned with sustained growth, where inclusiveness refers to equality of opportunity in terms of access to markets, resources and unbiased regulatory environment for businesses and individuals.

The **Asian Development Bank (ADB)** framed its corporate strategy (Strategy 2020) as aimed at promoting inclusive economic growth as one of its main objectives. In this framework, Inclusive Growth is a concept that goes beyond broad-based growth. It is "growth that not only creates new economic opportunities, but also one that ensures equal access to the opportunities created for all segments of society, particularly for the poor" (Ali and Hwa Son, 2007). An income growth episode is considered "inclusive" when: (*i*) it allows participation of (and contribution by) all members of society, with particular emphasis on the ability of the poor and disadvantaged to participate in growth (the "non-discriminatory" aspect of growth), which implies a focus on the "process" of growth; and (*ii*) is associated with declining inequality in those non-income dimensions of well-being that are particularly important for promoting economic opportunities, including education, health, nutrition and social integration (the "disadvantage-reducing" aspect of inclusive growth), which implies a focus on the "outcomes" of growth.

The **United Nations Development Programme** (UNDP) recently changed the name of its *International Poverty Centre* in Brasília, Brazil, to *International Policy Centre on Inclusive Growth* (IPC-IG), whose work is based on the premise that more equal societies perform better in development. In the UNDP perspective, inclusive growth is seen as both an outcome and a process. On the one hand, it ensures that everyone can participate in the growth process, both in terms of decision-making as well as in terms of participating in growth itself. On the other hand, inclusive growth is one whose benefits are shared equitably. Inclusive growth thus implies participation and benefit-sharing.

The **Europe 2020** Strategy has the notion of Inclusive Growth at its core. In this Strategy, Inclusive Growth is understood as "empowering people through high levels of employment, investing in skills, fighting poverty and modernising labour markets, training and social protection systems so as to help people anticipate and manage change, and build a cohesive society. It is also essential that the benefits of economic growth spread to all parts of the Union, including its outermost regions, thus strengthening territorial cohesion. It is about ensuring access and opportunities for all throughout the lifecycle".

The policy framework takes as a starting point OECD work on well-being. It states that society's objectives are multidimensional and go beyond income: although remaining an important means to pursue society's objectives, growth in GDP per capita is not considered as an end in itself. The OECD's *How's Life?* identifies eleven dimensions of well-being,[3] building on the relevant literature and on the

[3] Income and wealth, jobs and earnings, housing conditions, health status, work-life balance, education and skills, social connections, civic engagement and governance, environmental quality, personal security, subjective well-being.

recommendations of the Stiglitz-Sen-Fitoussi Commission (2009). These dimensions reflect both subjective and objective well-being outcomes (such as health status). At the same time, not all well-being dimensions may be relevant for the policy framework for Inclusive Growth. The choice of the relevant dimensions and the methods of aggregation will be addressed below.

A second premise of the OECD's work on well-being that is equally relevant for our understanding of Inclusive Growth is a focus on *individuals* and *households*, rather than on the economic system as a whole. Considering averages (means) only may not reflect the experiences of the *typical* household or individual. Thus, a policy framework for Inclusive Growth has to consider different segments of the distribution of outcomes, not only averages, such as the very poor, the median unit, the top 99%. While this choice may vary across countries to reflect specific preferences for distribution, various scenarios are presented below to illustrate the approach and assess the robustness of the empirical findings.

A word on terminology is in order. Although the term "welfare" is widely used in economics, it has many meanings outside the economics profession and is easily confused with "well-being", the OECD terminology for opportunities and outcomes within a broad set of material and non-material dimensions (OECD, 2011b). The number of dimensions proposed for consideration in the policy framework for Inclusive Growth in the present exercise is more limited than the one used by the OECD in its work on well-being. To avoid confusion the term "multidimensional living standards" is used to depict the welfare measure to be developed and used here.

Computation of multidimensional living standards requires the monetisation and aggregation of income and non-income dimensions, as well as average and distributional considerations. The Technical Annex explains in detail how the measure of multidimensional living standards is constructed and how its changes over time can be decomposed into an "average growth" effect and an "equality" effect. The average growth effect can be further decomposed into an effect due to changes in average income and an effect due to changes in average health outcome. The equality effect reflects changes in the distribution of resources across households.[4]

With these preliminary remarks, the proposed definition of Inclusive Growth is *a rise in the multidimensional living standards of a target income group in society* (also referred to as "representative" household). For illustration, the note focuses on the *median household* while the method is general and can be applied to all segments of the income distribution (see e.g. Foster and Székely, 2008), such as lower-income households, to allow for country-specific preferences. In this case, a rise in the multidimensional living standards of the representative household would entail a rise in the mean of multidimensional living standards of the most deprived segment of the population. Multidimensional living standards reflect outcomes in income and non-income components of well-being *and* their distribution across households.

Our approach can be seen as a generalisation of the concept of social inclusion, which is understood and measured by the degree to which equality (i.e. in terms of consumption, income, jobs or housing) is achieved, as for instance in recent work by Anand, Mishra and Peiris (2013). The authors also define a measure with equity and average growth components. However, their measure is calibrated on market income alone, whereas we attempt a more general formulation that extends to non-income dimensions.

[4] A specific case of this decomposition (with only one dimension, consumption and its distribution across individuals) has been developed and measured for the United States by Jorgenson (1990) and Slesnick (1998), with a recent update in Jorgenson and Slesnick (2014). Fleurbaey and Gaulier (2009) and Jones and Klenow (2010) show how changes in dimensions of quality of life (such as health and leisure) can be added to the decomposition by applying an equivalent income approach.

When income growth of a particular low-income group is selected as the target measure, the discussion is brought back to the measurement of pro-poor growth (Ravallion, 2004; Klasen, 2005; OECD, 2006). Indeed, Ravaillon and Chen (2003) use Growth Incidence Curves to establish a measure of the rate of pro-poor growth that equals the ordinary rate of growth times a "distributional correction". Specifically, growth is pro-poor if the actual change in poverty over time is greater than what would have been observed under distributional neutrality. A shift in income distribution in favour of the poor will lead to a measure of pro-poor growth that exceeds the average rate of growth and vice versa. Our approach is similar in spirit, insofar it shows whether growth has been especially favourable to specific groups of the population, as the income-poor, but can be generalised to other income groups and is also extended to cover the non-income dimensions jobs and health.

1.2. Measuring multidimensional living standards in practice

Multidimensional living standards have been defined in terms of income and selected non-income aspects of life that an individual can enjoy, and by the extent to which these aspects are distributed across the population. There are three steps to take when measuring multidimensional living standards at aggregate level:

- Measuring *income-based* living standards (captured for instance by consumption or real income) at the individual level.

- Bringing one or several *non-income* dimensions into the analysis and measuring these dimensions at the level of individuals or groups of individuals in order to combine them with measured income.

- Aggregating the broader living standard measure across individuals to obtain an overall measure of multidimensional living standards.

Measuring income-based living standards at the individual level

The most straightforward measure of living standards at the individual level ignores non-income dimensions or assumes that they are unchanged. Conceptually, an individual's living standards can then be represented by a utility function defined over a set of consumption goods. The individual uses income to purchase consumption goods and services. The individual's welfare index between two situations is then constructed by comparing the maximum utility that a particular level of income generates in each case, holding the prices of consumption goods constant (Samuelson and Swamy, 1974). This index of living standards is just the quantity dual to the well-established concept of a cost-of-living price index for consumers (Konüs, 1924). Indeed, the first step in Jorgenson (1990) and Jorgenson and Slesnick (2014) to measure living standards for the United States also consists of constructing measures of individual living standards.

For the income dimension of living standards, we follow this literature and use household real disposable income as the relevant measure. From a conceptual viewpoint, a measure of household real net *adjusted* disposable income is preferable (see Stiglitz, Sen, Fitoussi, 2009). This income measure adjusts disposable income for the value of social transfers in kind (health, education, housing) that households receive from government for free and is considered net of depreciation of capital goods held by households. While the underlying data meet the high statistical standards of the National Accounts, these data are not informative on how economic resources are distributed. To overcome this limitation, National Accounts information on household real net adjusted disposable income can be combined with the distribution of household real disposable income from household surveys, assuming that social transfers in

kind and the consumption of fixed capital (which are both excluded in the definition of income retained by household surveys) are distributed evenly across the income spectrum.[5]

Selecting non-income dimensions for the computation of multidimensional living standards

An extended framework is required to recognise non-income components. First, a choice needs to be made about the relevant non-income dimensions entering an individual's utility function. The *OECD Better Life Initiative* (OECD, 2011b), and the dimensions of well-being identified there, are the starting point for the task at hand. We propose three criteria for the choice of non-income dimensions. The dimensions should be relevant to individuals and households, there should be testable empirical links between the well-being dimensions considered and identifiable economic policies, and there should be reliable, timely and comparable data on the dimensions to be selected.

Empirical work on the determinants of subjective well-being shows that income-related variables, unemployment and health are highly significant (Boarini et al., 2012; OECD, 2013c). These dimensions are also prominent in the public policy debate. Two other non-income dimensions – education and environment – are plausible candidates for the computation of multidimensional living standards as well. Education matters for quality of life through its effects on income and certain non-income dimensions (such as health), but the independent role of education on life satisfaction is more controversial (OECD, 2013c).

Accounting for health status also implicitly picks up some of the detrimental effects of exposure to pollution, just as accounting for income picks up some the beneficial effects of education. This creates a channel through which environmental outcomes and policies can be taken into account in the framework. Direct valuation of environmental health effects would be complex (see Alberini et al., 2010, for recent OECD work), and data availability, especially for long time series, is far from guaranteed. The contribution of environment to quality of life (so called "non-use" value of environmental goods) goes beyond its impact on health, but this is even harder to measure.

In principle, thus, education and environmental could be introduced in the welfare function directly (as additional dimensions) or indirectly (as factors that affect outcomes in the other three dimensions; see for instance in Decanq and Shokkaert, 2014). While the first solution is less data-demanding than the second one (especially from the point of view of building welfare comparisons *over time*), the first is likely to make little difference to the welfare function calculation when using *subjective* shadow prices as these are arguably low for these two dimensions).[6] Against this background, the current approach only focuses on three dimensions (income, jobs and health) and aims at capturing effects of environmental quality and education via their impact on health, jobs and income.

The jobs dimension – people's active participation in production as a characteristic of inclusiveness – can be captured in different ways. Two prime candidates are the risk of unemployment and the employment rate. The latter has the advantage of taking into account differences in participation in the labour market, in addition to access to employment for those in the labour market, which is particularly relevant to capture barriers to participation for certain groups. The unemployment rate is a strong determinant of subjective well-being; in particular, the move from employment to unemployment has been shown to exert a strong negative effect on people's well-being. Unemployment is also the variable that has

5 The OECD has undertaken work to reconcile some of these differences (Fesseau and Mattonetti, 2013), but a full discussion is beyond the scope of the present note.

6 Boarini et al. (2012), show for instance that the coefficients of the education and of the satisfaction with air quality are very low as compared to that of unemployment and health.

repeatedly been used in the literature on the measurement of living standards and well-being (Fleurbaey and Gaulier, 2009).

At the same time, neither unemployment nor employment rates discriminate between different types of jobs – no account is taken of the large variations in working conditions. This may be particularly pronounced in developing countries and emerging market economies where informal employment is widespread although discussions about job quality loom also large in OECD countries. Another issue is that not all types of unemployment are equally relevant from the perspective of well-being. For instance, the incidence of long-term unemployment and weak prospects of returning to work following a lay-off seems to be more detrimental than short spells of unemployment between jobs. The average rate of unemployment cannot distinguish between these features of the labour market. While at this point we use unemployment to gauge the jobs dimension, future work will need to consider alternative formulations and their impact on multidimensional living standards. A start towards analysing alternative specifications has been made and results are reported in Box 6.

With respect to health, in studies analysing life satisfaction, the proxy used for the health status is often a "self-reported health" variable, which is affected by many types of measurement errors (Fujiwara and Campbell, 2011) and is available for most countries only since the mid-2000s. For these two reasons, it is more convenient to use an objective measure of health status, rather than a variable that reflects perceived health.

Among objective measures, morbidity-related variables would capture the prevalence of different types of diseases, such as chronic conditions, which are the most common form of illness and cause of death in high-income countries. Rising prevalence of chronic diseases is also often associated with a deteriorating environmental quality so that measuring health via morbidity would be a way of capturing some of the effects of the environmental quality of life. To arrive at a single measure, morbidity is often evaluated in terms of healthy life years gained or disability-adjusted life years, which combine years of life lost and years lost due to illness or disability. However, the latter variables are only available for a limited number of years after 2000.[7] As an alternative, the incidence of specific diseases, such as cancer, could be considered, but time series data is similarly scarce. Moreover, several illnesses other than cancer should be looked at simultaneously, which would be very data demanding, especially in developing countries and emerging market economies.

As an alternative, life expectancy could be considered. It could be argued that life expectancy shows little variation among OECD countries and over time and, as a result, do not discriminate between policy effects. However, weak variability among countries does not seem to be borne out by the data, even if only OECD countries are considered. Calculated over the 1995-2009 period, the number of years necessary to gain one extra year of life expectancy has varied significantly among OECD countries, including among high-income OECD countries.[8] Also, mortality and morbidity measures tend to be highly correlated with

7 Latest available year is 2008, see www.who.int/research/en/.

8 For instance, one year in life expectancy was gained in 5 years in the United States versus 3 years in Ireland, two countries with identical life expectancy in 1995. More generally, the rate of progress varies between 8.2 years (Mexico) and 1.9 years (Estonia) per additional year of life expectancy, with an average of 3.9 years and a standard deviation of 1.1 year. When excluding ten emerging or transition countries, the average is identical and the standard deviation falls to 0.7 years. Sen (1998) notes that "[…] mortality rates can shift very quickly indeed when it moves in an upward direction due to an economic crisis. Famines provide a class of examples in which the movement of mortality can be disastrously rapid, and they certainly do call for immediate economic response. But there are also examples of other kind of economic and social change in which mortality rates have gone up extremely fast. The recent experience of the former Soviet Union and of Eastern Europe provide many such terribly distressing cases."

each other, which makes the choice between these indicators relatively less important. For instance, the cross-country correlation in 2009 between life expectancy at birth and Potential Years of Life Lost is equal to -0.96. Finally, OECD work (OECD, 2010) has already documented links between life expectancy and environmental and life-style variables (See Section 3).

Mortality measures have the advantage of being widely available for large sets of countries and long time series. They are very well documented and available by age, gender,[9] and in some countries by educational attainment (Sen, 1998; Mackenbach et al., 2008). Also, there are large and persistent inequalities in longevity *within* countries that tend to be correlated with the socio-economic background of individuals (Deaton 2003, 2013). Furthermore, the socio-economic determinants of inequality in longevity, such as the education gradient of mortality, are very different across OECD countries (Box 3). The implication is that life expectancy is likely to play a significant role as a determinant of multidimensional inequality and as a driver of cross-country differences in the level and evolution of living standards. Sen (1998) draws a similar conclusion.

Box 3. Lifespan inequality and living standards

There are large and persistent inequalities in longevity within countries, which reinforce socio-economic inequalities. Eurostat (2013) reports the difference in life expectancy between highest and lowest-education groups for 11 European OECD countries between 2007-10. The gap comprised between 2.2 years (Portugal) and 14.2 years (Estonia) in 2010, with an average of 7.0 years that has remained broadly constant since 2007. Excluding Estonia, which has witnessed a marked decrease in its longevity gap, the average lifespan gap has actually increased by an average 0.4 years in Sweden and Norway, with even larger increases in Czech Republic and Slovenia.

Taking the monetary valuations in Table 1 as a basis, the value of a 7-year lifespan gap represents about 35.8% of disposable income for low-education households each year. Assuming a 10% return to education and a gap of 7 years of schooling between the lowest and highest education groups yields an income ratio of about 2. Factoring in the difference in life expectancy due to different education levels, the equivalent income ratio is equal to 2/(1-0.358)=3.1. Hence, accounting for lifespan inequality across educational groups appears to be of first-order importance.

Premature mortality, defined as mortality occurring before the age of 70 years, is another important aspect of lifespan inequality from an empirical standpoint. Premature mortality, defined as "potential years of life lost", was on average equal to 3700 years per 100 000 inhabitants aged 0-69 in 2009, ranging from 2400 in Iceland to 6900 in Mexico (OECD Health Data). The associated social cost of premature mortality is large, as noted by Murphy and Topel (2005). Even a very conservative valuation of USD 100 000 per life-year (bearing in mind that Murphy and Topel value a life-year between USD 200 000 and USD 350 000 between age 0 and 69 in the United States, 2004 prices), would yield an equivalent cost of USD 3700 per person aged 0-69. Notice that high premature mortality is also observed in high-longevity countries such as France (defining the so-called 'French Paradox'). Box 6 simulates the impact of premature mortality on aggregate welfare.

Welfare theory as a guide to monetising non-income dimensions

Various theoretical approaches exist to measure individual living standards as a function of income and non-income dimensions. They essentially differ in the assumptions about the valuation of non-income factors (Fleurbaey, 2009). A promising approach in welfare economics (Fleurbaey and Blanchet, 2013) is related to the notion of "equivalent income" to value non-material items. The equivalent income approach

[9] "The existence of a strong gender bias against women (and against young girls in particular) has been much discussed in the development literature. Gender bias is, however, very hard to identify, since many of the discriminations are subtle and covert, and lie within the core of intimate family behaviour. Mortality information can be used to throw light on some of the coarsest aspects of gender-related inequality. Indeed, even the simple statistics of the ratio of women to men in the total population can provide insights into the long-term discrimination against women in many societies" (Sen, 1998, p.11).

is a generalisation of Samuelson's (1974) money metric utility extended to non-income dimensions. Equivalent income is defined as the hypothetical income that would make an individual indifferent between her/his current situation in terms of non-income aspects of life and a benchmark situation (typically the best possible outcome in non-income dimensions). Equivalent income then replaces monetary income, and welfare comparisons between individuals, or over time, are similar to the simple case mentioned above (see Technical Annex for a more detailed explanation). Although the equivalent income approach used here is well anchored in the literature, the treatment of non-income dimensions, and in particular the measurement of inequality in dimensions, such as health, as well as the rationale for constructing multidimensional measures, are still the object of academic debate.[10]

A crucial element in the calculation of equivalent income is the monetisation of the benefits from non-income components. This monetisation depends first on a reference level to which individuals can compare their actual outcome in non-income components (e.g. the number of years of life expectancy above or below a benchmark level of longevity). In a second step, individuals' distance to the benchmark, measured in non-monetary units, is monetised and expressed in terms of equivalent income. The benchmark defines the origin of the valuation scale, whose unit is the imputed price of the non-material component.

The equivalent income approach has been criticised, because it relies on the *ad hoc* choice of a reference or benchmark. However, this choice is not bound to be arbitrary (Fleurbaey and Blanchet, 2013), and it is common practice to select a given country (e.g. Jones and Klenow, 2010), or top-performing countries in the various non-material dimensions, as a benchmark for cross-country welfare comparisons. In a longitudinal analysis (e.g. Becker et al., 2005), performance in non-income dimensions can be assessed with respect to a country's initial scores in the indicators measuring those dimensions to allow each country can be compared against its own set of benchmarks. This is akin to measuring market consumption or production at constant prices, for instance, by selecting the prices of a base period as a reference.

Choosing the shadow prices of non-income components

Assessing the shadow price of a non-income dimension is the main practical difficulty. There are three major sources of information, based respectively on stated preferences, revealed preferences and subjective well-being.

The *stated preferences methodology* uses surveys to ask individuals how much they would be willing to pay (or to accept) in compensation for gains (or losses) of non-income components. Such methodology has been widely applied for valuing changes in air and water quality, noise nuisance, health care, heritage, cultural assets, habitats, landscape and so on (see Bateman *et al*., 2002). However, this methodology has also been criticised as individuals are believed to overstate their valuation of non-material components by a large factor (Murphy *et a*l., 2005). Moreover, the stated willingness-to-pay elicited from a questionnaire is found to suffer from protest valuation and survey-related measurement errors (see Fujiwara and Campbell, 2011).

As an alternative, the *revealed preferences* methodology applies a hedonic pricing method to calculate the compensatory income for a given amenity or occupation-related risk. It has been widely applied in environmental and residential studies, among others. Another example of this approach is the Value of a Statistical Life; namely, the amount of money that a group of people is collectively willing to pay to lower a mortality risk so that one life is statistically preserved among this group. In practice, estimates of the Value of a Statistical Life are derived from data on wages and worker characteristics matched with job-related accident and mortality data. Surveys by Viscusi (1993), and Viscusi and Aldy (2003) suggest that

[10] See, for instance, Atkinson (2011) and the special issues of the 2011 Journal of Economic Inequality.

the range of estimates of a statistical life in the United States range between USD 4-9 million in 2004 prices. For instance, the US Environmental Protection Agency uses the default value of USD 6.3 million. In the context of environmental evaluations, the downside of the revealed preferences method is that it does not capture non-use value of environmental assets.

Valuations of non-income components can also be inferred from *subjective well-being* studies (e.g. Boarini *et al*., 2012). By regressing life satisfaction scores on income and any other non-material determinants of life satisfaction, one obtains a measure of the subjective shadow price of the non-income components by dividing the coefficient of the latter variable by the income's coefficient. The subjective shadow price is an implicit expression of trade-offs among dimensions that affect life satisfaction. The shadow price reflects an aggregate relationship between life satisfaction and non-income outcomes. This is not necessarily the mean of the same relationship at the individual level. The main purpose of computing shadow prices lies in assessing policy options, and it is important not to attach to it an individual, ethically questionable interpretation, in particular in conjunction with the shadow price of an extra year of life expectancy. Akin to the value of a statistical life, the shadow price depicts the average (across countries and over time) willingness to pay for reducing the collective risk of mortality. As it turns out, the method tends to deliver large values for non-income dimensions that constitute upper bounds and safeguard against under-estimation of the value of health or jobs.

One might ask why going through the trouble of estimating shadow prices based on life satisfaction measures and computing equivalent income scores, rather than relying on life satisfaction measures for policy analysis. The answer lies in the need to identify channels of policy transmission: for example, it is of interest to know the extent to which labour market outcomes affect household income and employment and then reviewing the effect of each component on the inclusiveness of growth.

Equivalent incomes can also be computed based on an "objective" or "model-based" approach. "Objective equivalent incomes" are derived from calibrating utility functions, which are, however, chosen in an *ad hoc* manner. As different utility functions generally yield different equivalent incomes, the choice of any utility function has to be justified in light of its empirical and theoretical implications. For instance, Cordoba and Ripoll (2014) criticise the use of the Constant Relative Risk utility function with intercept used by Becker *et al*. (2005), arguing that it underestimates the Value of a Statistical Life and hence the valuation of longevity in medium-income OECD countries. The authors propose instead to use a utility function based on Epstein-Zin-Weil preferences. Other utility functions, in particular those borrowed from behavioural economics, have also been considered to highlight the role of income comparisons or of differential valuation of gains and losses, but their use proved to be problematic.

Conversely, it has been argued that subjective approaches may be inflated by the subjective undervaluation of income (Clarck *et al*., 2008), due to emotional biases or survey-type measurement errors affecting life satisfaction (Kahneman and Deaton, 2010; OECD, 2013c). A comparison of existing sets of objective and subjective prices points to large differences between the two approaches. For instance, agents appear to be willing to pay on average about 3% of their income to suppress unemployment risk in an objective approach based on the Constant Relative Risk Aversion utility function (Fleurbaey and Gaulier, 2009) but between 10% and 20% based on subjective measures (Boarini *et al*., 2014).

Deriving a plausible range of price estimates is thus one of the main goals of OECD analysis in this area. Some evidence derived from ongoing work is reported below. First, findings by Boarini *et al*. (2014) point to much smaller differences between subjective and objective shadow prices than those found in the literature.

Box 4. Using Atkinson's generalised means to aggregate welfare across individuals

General means are grounded in Atkinson's (1970) framework for inequality and welfare analysis and belong to the family of "equally distributed welfare" functions. Formally, general means are defined as follows:

$$w_{1-\tau} = \left(\frac{1}{n}\sum_i w_i^{1-\tau}\right)^{\frac{1}{1-\tau}} \text{ for all } \tau \neq 1 \text{ and } \quad w_{1-\tau} = \left(\prod_i w_i\right)^{1/n} \text{ for } \tau = 1.$$

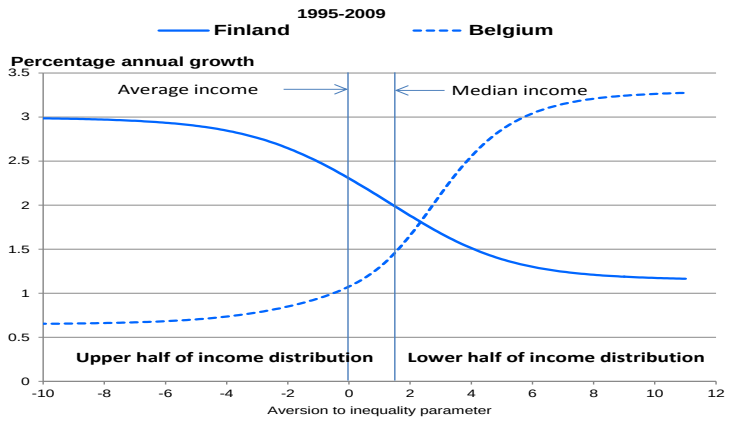
where the vector w=(w.1,…w n) measures the welfare distribution, w.i>0 is the welfare of the i-th person, and n is the population size.

The general mean reduces to the standard mean when τ =0 and to the geometric mean when τ =1. The general mean of individual welfare places greater weight on higher welfare individuals and less weight on lower welfare individuals as the parameter rises. Hence τ is sometimes interpreted as a measure of the level of inequality aversion.

In the simple case where individual welfare is defined in income alone, the general mean is called "income standards" (Foster and Székely, 2008). An ongoing OECD project uses income standards to look at the evolution of income growth across the whole distribution (Causa and Ruiz, 2014, forthcoming). This approach, which builds on Foster et al. (2013) and is also used by the World Bank for tracking income inclusiveness has been applied to all OECD countries from mid-1990s to the end of 2000s.

Figure A illustrates the findings for Belgium and Finland, two countries that experience opposite trends in growth of income standards. In Belgium, between 1995 and 2009, incomes grew faster among households in the lower half of the distribution and particularly so among the poorest. By contrast, Finland recorded a marked increase in income growth among households in the upper half of the income distribution.

Figure A: Income growth has benefitted different social groups: Belgium and Finland



Source: Causa, O., A. de Serres and N. Ruiz (2014), "Can growth-enhancing policies lift all boats? A preliminary analysis based on household disposable incomes", *OECD Economics Department Working Papers*, OECD Publishing, Paris, forthcoming.

Aggregating across individuals or groups of households

There are various options for aggregating multidimensional living standards or welfare across individuals. In a pure utilitarian perspective, the aggregate measure is the mean income across individuals, with each individual's income receiving the same weight. Utilitarianism has been criticised (see for instance Sen, 1970 and 1980; Fleurbaey and Gaulier, 2009; and Fleurbaey and Blanchet, 2013) as it implicitly assumes that the utility of the poor and of the rich can be traded on a one-for-one basis.

As the distribution of outcomes matters, a broader class of aggregates can be considered (Kolm, 1969; Atkinson, 1970; Sen, 1970; Box 4). A convenient way is to apply a generalised mean and to specify a parameter that allows one to gauge living standards for a particular group of the population. While the choice of this group is normative and will vary across societies and time, it is possible to contemplate several scenarios, from the extreme case where inequality of outcomes does not influence aggregate welfare (e.g. pure utilitarianism) to a situation where aggregate welfare coincides with the welfare of the most deprived person, as in Rawls theory.

In what follows, we measure aggregate multidimensional living standards as the equivalent income of a representative household chosen to be close to the median. To test for the sensitivity of this choice, we also present multidimensional living standards as the equivalent income of the poorest 10% of households. As the measures of equivalent income are the product of a term that captures average equivalent income and a term that captures the dispersion of equivalent income, changes in multidimensional living standards over time can be conveniently decomposed into changes in the average equivalent income plus changes in the dispersion of equivalent income (see Technical Annex).

1.3. The multidimensional living standards methodology: An illustration

This section presents an empirical illustration of the equivalent income method. The analysis is based on two non-income dimensions: health (life expectancy) and jobs (unemployment). For the inequality measure, the distribution of equivalent income is assumed to be equal to the distribution of disposable income. This is a strong assumption dictated by current data availability. Including inequalities in non-income dimensions is potentially important, because there are large discrepancies in non-income outcomes within countries. Moreover, poor outcomes in non-income dimensions are likely to be highly correlated with low income, implying that inequality in equivalent income might be significantly higher than income inequality alone (Box 6).

For the purpose of the present illustration, the subjective approach has been used to compute shadow prices (Box 5). Equivalent incomes have been calculated for each decile of the distribution of household disposable income by adding household disposable income to the monetised value of health and unemployment outcomes. These equivalent incomes were then aggregated so as to reflect the median income.

Box 5. Computing subjective shadow prices through life satisfaction regressions

Subjective shadow prices have been computed by running macro-level life satisfaction regressions on (log) household disposable income, life expectancy and unemployment:

$$LS_{j,t} = a_j + b_t + \alpha \log y_{j,t} + \beta^T T_{j,t} + \beta^U U_{j,t} + \varepsilon_{j,t}, \quad (1)$$

where LS stands for average life satisfaction in country j at time t, y for household real disposable income, T for country-level life expectancy, U for the rate of unemployment and for an error term. From the above regression, the "subjective" compensating income corresponding to one additional year of life or one additional percentage point of unemployment is given by :

$$\delta^S_{j,t} = y_{j,t}\left[1 - \exp\left(-\frac{\beta^k}{\alpha}\right)\right] \text{ with } k \in \{T, U\}.$$

In this framework, compensating differentials are a share of personal income that is common to all countries as the elastisticies from the life satisfaction regressions are by assumption homogenous across the sample. Homogeneity is assumed for the sake of simplicity and because of the limited number of observations in the country-level regressions. Homogeneity is also supported by research showing that elasticities are relatively similar across countries with a similar level of economic development (Helliwell et al., 2008). Regressions are run at country-level to correct for possible measurement error and unobserved heterogeneity in individual-level regressions (see Boarini et al., 2014).

Based on the Gallup World Poll survey, we estimate regression (1) on 32 countries during 2005-10. Various empirical specifications have been tested as robustness test. Table A reports the results. Across all specifications, the coefficients of log income, life expectancy and unemployment are significant.

Table A. Macro-level Life Satisfaction (32 Countries, 2006-10)

	Actual series			Smoothed series		
	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable is average life satisfaction					
Log household disposable income	1.286***	1.286***	3.538***	1.290***	1.291***	2.465***
	(0.213)	(0.216)	(0.933)	(0.202)	(0.205)	(0.355)
Unemployment rate	-0.067***	-0.068***	-0.063***	-0.067***	-0.066***	-0.041***
	(0.014)	(0.015)	(0.012)	(0.014)	(0.015)	(0.008)
Lagged life expectancy	0.058***	0.058**	0.192**	0.059***	0.060***	0.200***
	(0.022)	(0.023)	(0.087)	(0.021)	(0.022)	(0.036)
Subjective price of one unemployment percentage point (% income)	**5.1**	**5.2**	**1.8**	**5.1**	**5.0**	**1.6**
Subjective price of one year of life expectancy (% income)	**4.4**	**4.4**	**5.3**	**4.5**	**4.5**	**7.8**
Time dummies	No	Yes	Yes	No	Yes	Yes
Country dummies	No	No	Yes	No	No	Yes
R^2	0.51	0.52	0.96	0.59	0.59	0.99
N	144	144	144	144	144	144

Note : annual series smoothed with Hodrick-Prescott filter with smoothing parameter 50.

Source: Boarini. et al. (2014), "Beyond GDP – Is there a law of one shadow price?", *OECD Statistics Directorate Working Paper*, OECD Publishing, Paris, forthcoming.

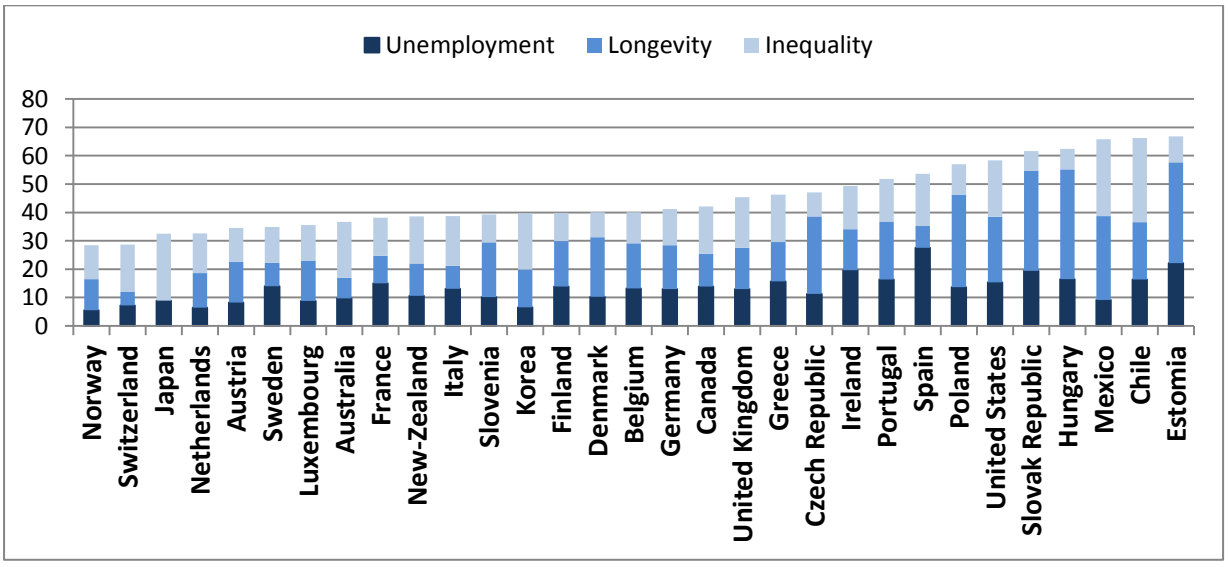
A cross-country comparison of multidimensional living standards

Before moving to the temporal comparisons of multidimensional living standards associated with Inclusive Growth, we provide a comparison of living standards across countries. Figure 1 presents levels of equivalent income for non-income dimensions as a share of disposable income. Equivalent income for health reflects the monetised value of difference with regard to the reference country with the highest life expectancy (Japan). For the jobs dimension, absence of unemployment has been taken as the reference value.[11] As a consequence, all countries show welfare losses due to unemployment. Equivalent income then presents the loss in multidimensional living standards that a representative household (close to median) in a particular country suffers from experiencing unemployment, an unequal distribution of household income and shorter longevity than Japan. On average, the total loss in living standards associated with the three components represents as much as 45% of disposable income, with almost equal contributions of income inequality, health and unemployment.[12]

The contribution of income inequality captures the distance between median and average income. It is thus dependent on the choice of a specific income group (the median household in the case at hand). If the target group were chosen as the bottom quartile of the income distribution, the overall welfare loss would amount to 63% of disposable income (with the loss due to income inequality amounting to 33% of disposable income). If the simple average household is taken as target, the total loss in multidimensional living standards would represent 30% of disposable income (17% for health and 13% for unemployment).

Figure 1. Losses in living standards, 2009

(as a share of household disposable income)



Note: The target group for living standards is households with median income.

Source: OECD calculations based on OECD Annual National Accounts, OECD Income Distribution Database and OECD Health Database.

11 It stands to reason that zero unemployment may never be attained and indeed may not even be desirable. Alternatively, thus a positive but low rate could be used as a benchmark.

12 Health has the largest impact (about 17% of disposable income), followed by inequality (15%) and unemployment (13%). The inequality measure is income based and therefore not a comprehensive measure of inequality.

Additional computations were carried out to test for the effects of using objective rather than subjective shadow prices for the valuation of life years lost or for the risk of unemployment. The results are reported in Table 1. The subjective approach provides estimates based on a regression analysis on life satisfaction surveys, the objective approach computes estimates using a constant relative risk aversion (CRRA) utility function calibrated against information from revealed preferences studies (see Boarini et al., 2014, for more details on the method). As mentioned earlier, the CRRA measures constitute a lower bound as risk aversion parameters apply to all components, rather than being specific to mortality and the risk of unemployment. Indeed, when a different utility function based on Epstein-Zin-Weil preferences is used, shadow prices increase and are nearly equal to the results obtained by the subjective method. Therefore, for the period and countries at hand, the choice of methods for the valuation of shadow prices provides a very consistent set of estimates. The next section also includes a robustness test on the impact of different shadow prices on the measured growth of living standards.

Table 1. Objective and subjective shadow prices

Losses in living standards as percentage of household disposable income

	Objective approach		Subjective approach
	CRRA	Epstein-Zin-Weil	
Highest longevity	13.3	16.4	18.1
No unemployment	7.1	11.5	13.1

Note: average across 32 OECD countries, 2009.

Source: Boarini et al.2014, "Beyond GDP – Is there a Law of one shadow price?", OECD Statistics Directorate Working Paper, OECD Publishing, Paris, forthcoming.

A temporal comparison: clustering of countries and "welfare" accounting

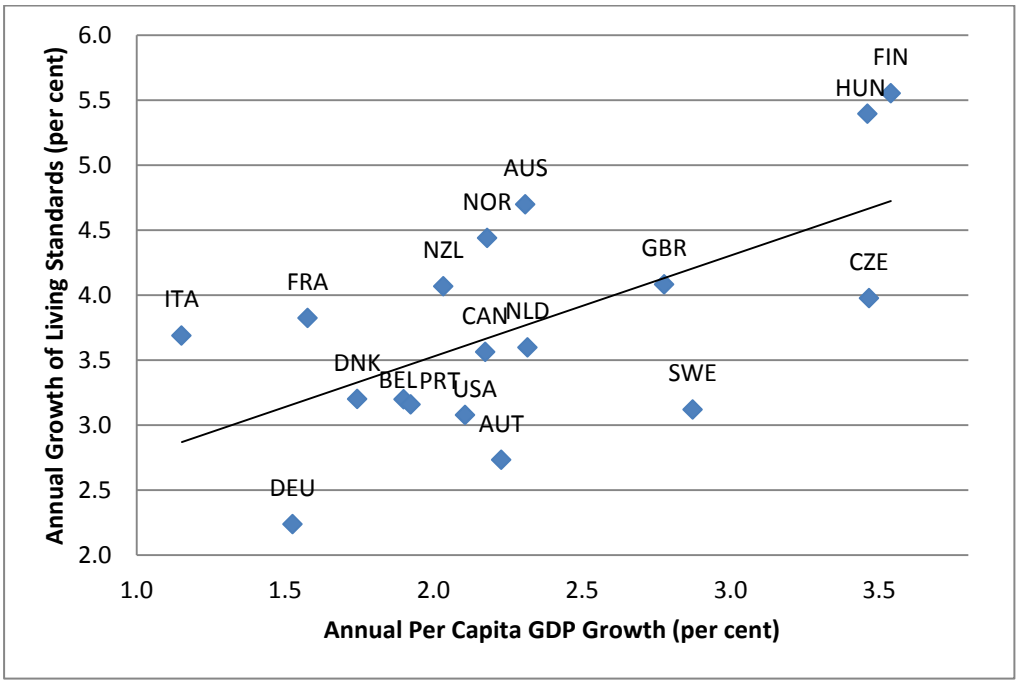
The next task is to examine the evolution of multidimensional living standards over time and to identify its drivers. The results are presented in Figure 2 and Table 2 that compares annual growth of living standards with per capita GDP growth among 18 OECD countries over the *pre-crisis* period 1995-2007. Shadow prices are based on the subjective approach and the median equivalent income is our reference. In other words, we take a view of the evolution of multidimensional living standards for the "middle class". A number of observations can be made.

- All measures of multidimensional living standards show improvements over the period of analysis and would thus point to persistent Inclusive Growth based on our definition. This has to be put in perspective, however. The growth rate of multidimensional living standards for the median household is almost certainly biased upward, because our current measure of inequality only reflects inequality of disposable income, not inequality of equivalent income. Unemployment and life expectancy are distributed unequally across individuals (see for instance OECD, 2011a, OECD, 2011b) and enhance the (mostly negative) effects of increasing inequality (see Box 6 for an illustration based on French data). This would in turn reduce the measured change in multidimensional living standards for the median household. Developing the data needed to capture inequality in jobs and health for all countries is therefore important in future work.

- Relative performance varies when measured in terms of GDP per capita and multidimensional living standards.[13] The cross-country correlation between growth rates of GDP per capita and multidimensional living standards is positive but with large variance across countries. Indeed, only 38% of the variance in the growth of multidimensional living standards between countries can be statistically explained by growth in GDP per capita. The stark difference between economic growth and growth of multidimensional living standards is best illustrated by country examples: France and Germany experienced almost the same rate of growth of GDP per capita during 1995-07, but living standards grew 1.7 times faster in France. The same picture arises by comparing the trajectories of Australia and Austria, as well as Finland and Czech Republic. Conversely, some countries have switched relative positions when moving away from GDP towards multidimensional living standards. For instance, economic growth was 2.5 times faster in Sweden than in Italy, but growth in multidimensional living standards was about 20% lower in Sweden. One element that shapes these differences is the divergence between GDP growth and the growth of average household income, influenced by structural factors such as the fiscal stance or the respective roles of the private and public sector.

Further differences arising from inequality in health and jobs outcomes are explored below. On the basis of these simple examples, we can already conclude that moving from GDP per capita to a measure of multidimensional living standards is non-trivial, and differences are likely to be even more pronounced if developing countries and emerging market economies are included in the sample.

Figure 2. Growth in multidimensional living standards and GDP per capita before the crisis, 1995-2007



Source: OECD calculations based on OECD Annual National Accounts, OECD Income Distribution Database and OECD Health Database.

13 This is also a finding by Beal, Rueder-Sabater and Espirito-Santo (2012) who construct measures of well-being that cover 10 different dimensions and 150 countries. "...countries with higher GDP are not necessarily the best at converting their wealth into well-being for their citizens". (p. 5).

Box 6. The impact of health inequalities on living standards: An illustration

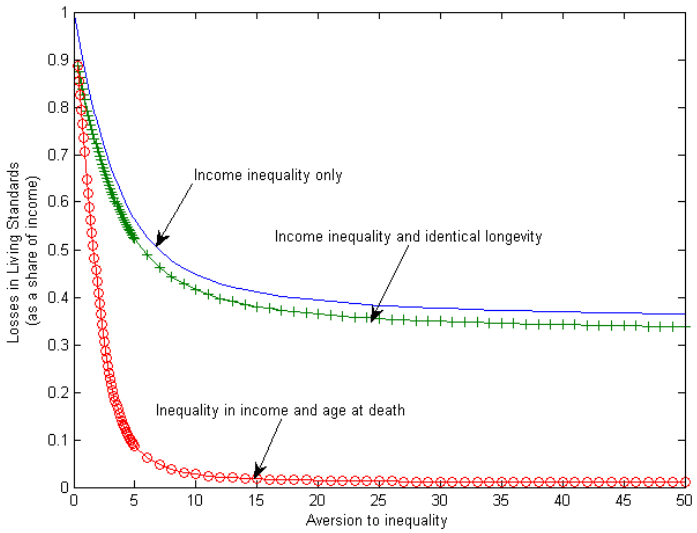
From a perspective of living standards, it is important to account for differences in longevity across socio-economic groups, because ignoring inequality in lifespan leads underestimates inequalities in living standards.

To illustrate, Figure B depicts losses in living standards as a share of average income for France in 2010 as a function of the target group of households. Living standards are estimated with the help of copula functions that simulate the joint distribution of income and age at death. In a first step, only the income dimension is considered (upper curve), whereas in another scenario, individuals differ in their income but have a similar life expectancy, which is nonetheless lower than the reference life expectancy in Japan (middle curve). Finally, individuals have different income and ages at death, and the latter two variables are considered as positively correlated in order to match the difference in life expectancy between the bottom and top quartiles of the income distribution, using van Raalte et al. (2012) for calibration.

Figure B shows that inequality in lifespan involves a similar loss in living standards as income inequality. For a representative household earning the median income (i.e. with the parameter of aversion to inequality close to 1.5), income inequality involves a loss of 19% of income, versus 23% for inequality in lifespan. For a household situated close to the 20th percentile ('aversion to inequality' close to 5), the losses associated with inequality in income and lifespan amount to 44% and 41% of income, respectively. Thus, health inequality appears to weigh as much as income inequality on living standards.

A major study on the evolution of life expectancy in the United States (Crimmins, Cohen and Preston, 2011) reports growing differentials in life expectancy between the U.S. and other developed countries but also growing differentials among groups of the U.S. population. Much is attributed to behavioural reasons, such as smoking or lack of physical exercise. These are not randomly distributed in the population; rather, they are more likely to affect the health of people of lower social status and those who are less likely to have lifetime access to health care. There is also an important gender component which provides further evidence to unequal distribution of life expectancy in the population. An ongoing project carried out by the OECD Statistics Directorate extends the measurement of inequality in lifespan and living standards to other OECD countries.

Figure B. Health inequality is as important as income inequality in terms of loss in living standards

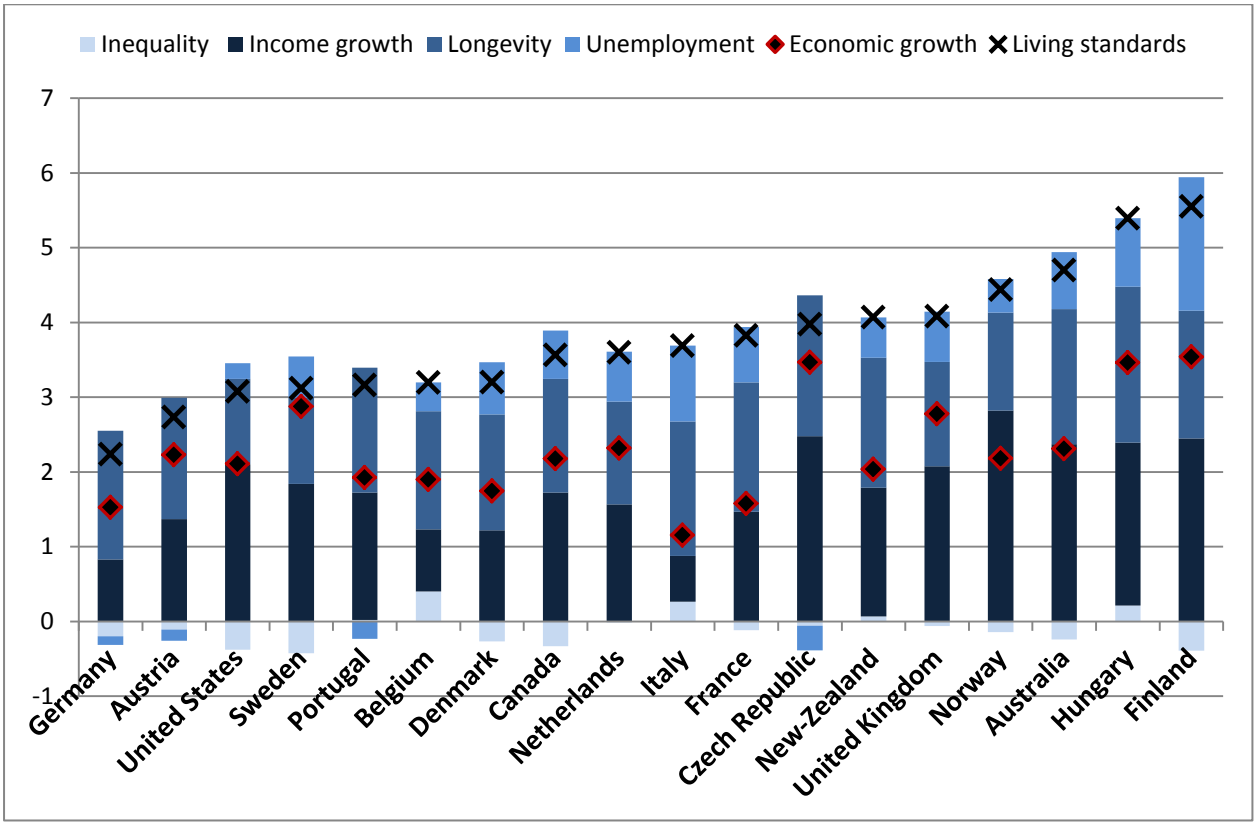


Source: OECD calculations based on OECD Annual National Accounts, OECD Income Distribution Database and OECD Health Database.

Figure 3 helps to explain why large discrepancies in growth of multidimensional living standards may arise across countries that experience the same pace of growth in GDP per capita. The figure depicts the respective contributions of household income, longevity, unemployment and income inequality to growth in multidimensional living standards. The growth of GDP per capita is also reported.

The contribution of changes in inequality to changes in multidimensional living standards reflects the degree to which the target group's (equivalent) income growth deviates from average (equivalent) income growth. This is somewhat different from stating that rising inequality *as such* drags down multidimensional living standards. Take, for instance, a situation where the income of the target group (say, the median household) remains unchanged between two periods and only the income of the lowest decile increases. This would translate into an unchanged overall measure of multidimensional living standards, driven by two offsetting effects: a positive effect due to the rise in average income (as low-income households earn more with everyone else's income unchanged) and a negative "inequality" effect, because median households did not benefit from the increase in average income. Yet, an overall measure of inequality, such as the Gini coefficient, would show a decline in inequality.

Figure 3. Contributions of household income, longevity, unemployment and income inequality to growth in multidimensional living standards before the crisis, 1995-2007



Source: OECD calculations based on OECD Annual National Accounts, OECD Income Distribution Database and OECD Health Database.

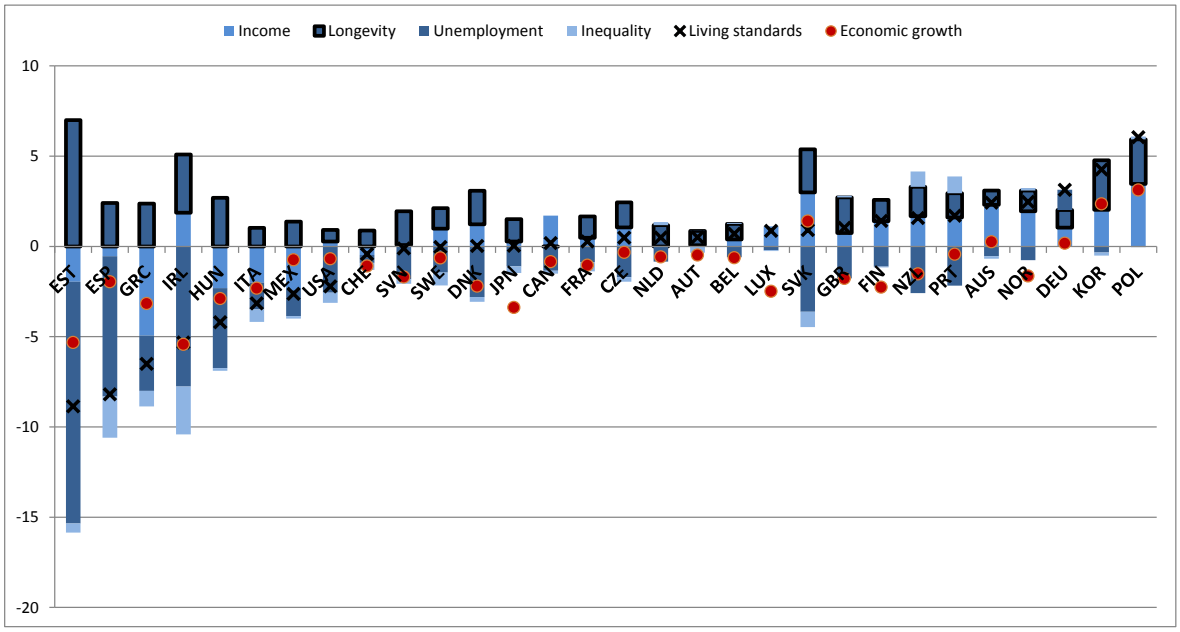
Australia, Hungary and Finland are countries that display both stronger growth in multidimensional living standards and income relative to OECD averages. They combined strong household income growth with large gains in longevity (Hungary, Australia) or reductions in unemployment (Finland). Conversely, Germany witnessed slow household income growth and an increase in income inequality, which jointly

explain a significantly lower improvement in multidimensional living standards during 1995-07. Sweden and the United States performed fairly well on unemployment reduction and income growth, which compensated for relatively small improvements in longevity and a rise in inequality. Moreover, four countries had no reduction in unemployment (Austria, Germany, Czech Republic, Portugal), and inequality declined only in four countries (Belgium, Hungary, Italy, New Zealand). Multidimensional living standards increased relatively more in countries where they were initially lower, a convergence in multidimensional living standards that has been driven by convergence in the underlying dimensions (income, unemployment and, to a lesser extent, longevity) as well as income inequality. Note that these observations relate to *changes over time* and are not indicative of the *levels* of unemployment or income. For example, the level of Austrian unemployment has been traditionally low, permitting less improvement than in a situation of high unemployment. Level comparisons as in Figure 1 are thus useful complements to comparisons over time.

The findings reported above relate to the decade before the economic crisis. Indeed, the evolution of multidimensional living standards took a different turn after the crisis, a fact also borne out by the work of Jorgenson and Slesnick (2014). Figure 4 depicts the contributions of average household income, unemployment, longevity and inequality on growth of multidimensional living standards among 30 OECD countries between 2007-11 or the latest available year. On (unweighted) average, multidimensional living standards fell by around 0.5% per year. Four OECD countries (Estonia, Spain, Greece, and Ireland) witnessed a decline in multidimensional living standards of more than 5% annually – a sharper drop than GDP per capita. The bulk of the loss is explained by rising unemployment, while disposable household income moved much less, often helped by the transfer system.

Figure 4. Growth of multidimensional living standards and GDP per capita during the crisis, 2007-11

(or latest available year)



Source: OECD calculations based on OECD Annual National Accounts, OECD Income Distribution Database and OECD Health Database.

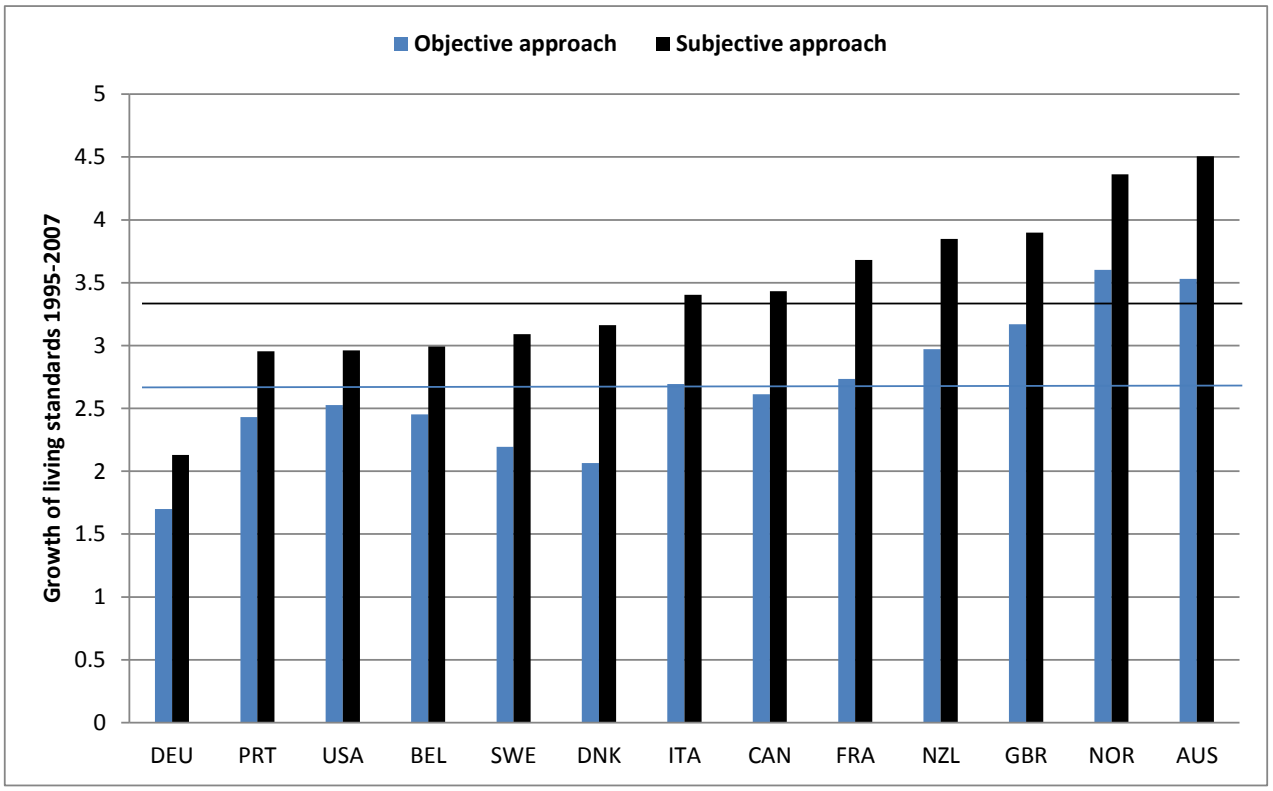
Table 2. Multidimensional living standards before the crisis

	LIVING STANDARDS ACROSS COUNTRIES 2009			ECONOMIC GROWTH 1995-2007	GROWTH OF LIVING STANDARDS 1995-2007									
	Inequality's negative contribution to living standards as a share of disposable household income (2009, in percentage points)			Per capita GDP growth, in percentage points	Living standards contributions of annualized growth in: (1995-2007, in percentage points)							Growth of living standards (1995-2007, in percentage points)		
					Average household income	Longevity	Unemployment	Interaction term	Inequality					
Income reference:	Average (tau=0)	Median (tau=1.5)	Percentile 10 (tau=50)						Average (tau=0)	Median (tau=1.5)	Percentile 10 (tau=50)	Average (tau=0)	Median (tau=1.5)	Percentile 10 (tau=50)
AUS	0.0	19.8	58.7	2.3	2.4	1.6	0.6	0.4	0.0	-0.2	-0.4	**4.9**	**4.7**	**4.6**
AUT	0.0	11.9	46.1	2.2	1.4	1.5	-0.1	0.1	0.0	-0.1	0.3	**2.8**	**2.7**	**3.1**
BEL	0.0	11.0	43.7	1.9	0.8	1.3	0.3	0.4	0.0	0.4	2.6	**2.8**	**3.2**	**5.4**
CAN	0.0	16.7	52.9	2.2	1.7	1.3	0.5	0.4	0.0	-0.3	-0.7	**3.9**	**3.6**	**3.2**
CHE	0.0	16.8	58.0											
CZE	0.0	8.5	35.2	3.5	2.5	1.7	-0.2	0.1	0.0	-0.1	-0.5	**4.0**	**4.0**	**3.5**
DEU	0.0	12.7	45.4	1.5	0.8	1.4	-0.1	0.3	0.0	-0.2	-0.4	**2.4**	**2.2**	**2.1**
DNK	0.0	8.8	39.8	1.7	1.2	1.3	0.5	0.4	0.0	-0.3	-0.9	**3.5**	**3.2**	**2.6**
ESP	0.0	18.4	52.8											
EST	0.0	9.1	29.4											
FIN	0.0	10.0	41.2	3.5	2.4	1.3	1.3	1.0	0.0	-0.4	-1.4	**5.9**	**5.6**	**4.6**
FRA	0.0	13.5	47.3	1.6	1.5	1.4	0.6	0.5	0.0	-0.1	-0.2	**3.9**	**3.8**	**3.7**
GBR	0.0	17.9	52.3	2.8	2.1	1.2	0.5	0.4	0.0	-0.1	-0.7	**4.1**	**4.1**	**3.5**
GRC	0.0	16.7	50.6											
HUN	0.0	7.2	27.6	3.5	2.2	1.5	0.4	1.1	0.0	0.2	0.3	**5.2**	**5.4**	**5.5**
IRL	0.0	15.2	46.3											
ITA	0.0	17.6	57.3	1.2	0.6	1.5	0.8	0.5	0.0	0.3	1.4	**3.4**	**3.7**	**4.8**
JPN	0.0	23.6	69.1											
KOR	0.0	19.8	62.1											
LUX	0.0	12.5	46.3											
MEX	0.0	27.1	53.1											
NLD	0.0	14.1	52.0	2.3	1.6	1.2	0.5	0.3	0.0	0.0	-0.3	**3.6**	**3.6**	**3.3**
NOR	0.0	11.9	53.0	2.2	2.8	1.2	0.4	0.2	0.0	-0.1	-0.6	**4.6**	**4.4**	**3.9**
NZL	0.0	16.6	52.7	2.0	1.7	1.5	0.4	0.3	0.0	0.1	0.4	**4.0**	**4.1**	**4.4**
POL	0.0	10.8	36.3											
PRT	0.0	15.1	44.2	1.9	1.7	1.4	-0.2	0.2	0.0	0.0	0.3	**3.1**	**3.2**	**3.4**
SVK	0.0	7.0	28.5											
SVN	0.0	9.8	42.4											
SWE	0.0	12.6	49.5	2.9	1.8	1.0	0.5	0.3	0.0	-0.4	-1.7	**3.5**	**3.1**	**1.9**
USA	0.0	19.8	50.0	2.1	2.1	1.0	0.1	0.2	0.0	-0.4	-1.3	**3.5**	**3.1**	**2.2**
Average	**0.0**	**14.4**	**47.5**	**2.3**	**1.7**	**1.3**	**0.4**	**0.4**	**0.0**	**-0.1**	**-0.2**	**3.9**	**3.8**	**3.6**

Source: OECD calculations based on OECD Annual National Accounts, OECD Income Distribution Database and OECD Health Database.

Finally, the results are broadly unchanged when different variables are used to capture the jobs dimension and different shadow prices are used. Box 7 shows how the estimates of shadow prices change when the employment rate (as share of working-age population) is used instead of the unemployment rate, and when the duration of unemployment is taken into account. Figure 5 uses a different set of shadow prices and recalculates the growth of multidimensional living standards between 1995 and 2007, while basing the contributions of longevity and unemployment on the "objective approach" described in Boarini et al. (2014). This set of objective shadow prices can be considered as very conservative, since it underestimates the value of a statistical life for lower-income countries and uses very low risk aversion to unemployment risk, and therefore it provides a natural lower bound to the estimates of improvements in multidimensional living standards. The cross-country correlation between growth in multidimensional living standards based on the objective and subjective approaches is 0.95, and the ranking of countries is virtually unchanged. As the objective shadow prices of longevity and unemployment are lower than the subjective ones, the average growth in multidimensional living standards is slightly lower in the objective approach (2.7% instead of 3.4%), due to a lower contribution of longevity (1.1% instead of 1.6%) and unemployment (0.2% instead of 0.5%). Hence, the latter two dimensions account for about one-half of the estimated growth in multidimensional living standards, even when conservative shadow prices are used.

Figure 5. Assessing the impact of shadow prices on multidimensional living standards



Source: OECD calculations based on Boarini et al. (2014), "Beyond GDP – Is there a law of one shadow price?", OECD Statistics Directorate Working paper, OECD Publishing, Paris, Forthcoming.

Box 7. A robustness analysis of the proxy variable for the jobs dimension of multidimensional living standards

The unemployment rate has been selected as a benchmark variable for the jobs dimension, as microeconomic evidence suggests that being unemployed is highly detrimental to subjective well-being, an effect that is above and beyond the income loss associated with joblessness (Boarini et al., 2012, Dolan et al., 2008). Unemployed workers report low life satisfaction as they are deprived of work (i.e. cannot work despite their willingness to do so), while employed workers do not report higher subjective well-being relative to people who chose not to work (OECD, 2013c), even when income differentials are taken into account.

The adverse effect of unemployment on subjective well-being is also found to depend on the duration of unemployment (Lucas et al., 2004). However, two hypotheses can be considered: (i) the longer the actual unemployment spell, the lower the subjective well-being; and (ii) the lower the expected unemployment spell, the lower the subjective well-being. The first hypothesis predicts that the long-term unemployment rate has a larger negative impact on life satisfaction than the short- and medium-term unemployment rate (i.e. workers being unemployed for less than a year). The second hypothesis implies that the unemployment rate has a larger negative impact in countries and/or periods in which the unemployment outflow rate is low, that is, when the prospects of finding a job are low.

Using the unemployment turnover variables used in de Serres and Murtin (2014) allows to test for the two hypotheses, as reported in columns 2 and 3 of the table below. The first hypothesis is not confirmed by the data, whereas the second hypothesis cannot be rejected. The findings suggest that the subjective effect of unemployment takes place through the re-employment prospects of the unemployed.

Table B. Empirical specifications of the jobs and life satisfaction relationships

	(1)	(2)	(3)	(4)
	Dependent variable is average life satisfaction			
Log household disposable income	3.538***	2.876***	2.984***	4.421***
	(0.933)	(0.871)	(0.925)	(0.889)
Lagged life expectancy	0.192**	0.147*	0.236***	0.179**
	(0.087)	(0.084)	(0.085)	(0.085)
Unemployment rate	-0.063***			
	(0.012)			
Short et medium-term unemployment rate		-0.060***		
		(0.022)		
Long-term unemployment rate		-0.055**		
		(0.022)		
Unemployment rate when outflow is high			-0.039**	
			(0.018)	
Unemployment rate when outflow is low			-0.059***	
			(0.012)	
Employment rate (% population aged 15-64)				0.060***
				(0.014)
Old-dependency ratio				0.276***
				(0.099)
Subjective price of one year of life expectancy	**5.3**	**5.0**	**7.6**	**4.0**
Subjective price of one unemployment percentage point	**1.8**	**2.1/1.9**	**1.3/2.0**	
Subjective price of one employment percentage point				**1.3**
R^2	0.96	0.97	0.97	0.96
N	144	136	141	144

Note: country and time dummies always included.

Source: OECD calculations based on Boarini et al. (2014), "Beyond GDP – Is there a law of one shadow price?", OECD Statistics Directorate Working Paper, OECD Publishing, Paris, forthcoming.

Another issue concerns the relevance of this framework to emerging market economies, where formal social safety nets are in general less developed. Typically, the share of workers covered by unemployment insurance is much lower in those countries, so that job-seekers would not necessarily register with employment and placement agencies, and may instead make a living in the informal sector. As a consequence, the rate of unemployment would not necessarily reflect the actual share of jobless workers, and the rate of employment among the working-age population may be an alternative proxy to consider. As the employment rate could be spuriously affected by the age structure of the working-age population, and as age is itself a determinant of subjective well-being (Wunder et al., 2013), the old-age dependency ratio is added as a demographic control when labour market participation is proxied by the employment rate. Column 4 shows that all three dimensions of living standards (income, longevity and employment) are positively-signed and highly significant.

Using employment rather than unemployment reduces somewhat the shadow valuation of longevity. Growth of

living standards for the median household would amount to 4.4% on average during 1995-2007, as opposed to 3.8%, and the average contribution of employment to the growth of living standards is 0.9%, as opposed to 0.5% for unemployment (Table 2). This is due to inactive people, who are not taken into account in the unemployment rate but are included in the pool of employed workers. The average contribution of longevity rises from 1.6% to 1.9% mostly due to a stronger interaction with employment growth.

2. Identifying policies for inclusive growth

2.1. A general framework for linking policies to multidimensional outcomes

Measuring multidimensional living standards is only a first step towards providing policy analysis and advice for Inclusive Growth. The link to policies starts by acknowledging that different dimensions of well-being are driven by a combination of policy and non-policy factors. GDP per capita tends to be higher in countries that pursue pro-growth policies, but it is also affected by non-policy drivers, which can be exogenous, such as geography, or endogenous, such as good health or education. In a similar manner, health outcomes are influenced by health policies, such as government spending on health care, but also indirect factors, such as income and lifestyle, suggesting that there may be feedback linkages between different outcomes. The way resources are distributed can also affect equality of opportunities to participate in the production process and potentially average outcomes.

Policies in areas such as taxation, innovation and labour market, which influence growth in GDP per capita, may also affect outcomes in the non-income dimensions of well-being over and above their effects on GDP. For example, the distribution of income, wealth or consumption may change as a consequence of policies that aim to enhance GDP growth. Similarly, fiscal policies may affect the non-income dimensions of well-being in terms of environmental, health and education outcomes. Such effects have been analysed in OECD work, but they have been considered either as unintended consequences of growth policies or as policy issues in their own right (*Growing Unequal*, *Divided We Stand*, and related work), without taking an integrated analytical and policy perspective. Recent OECD work has started to address these shortcomings by analysing the trade-offs among growth, equity and social preferences when pursuing fiscal consolidation.[14]

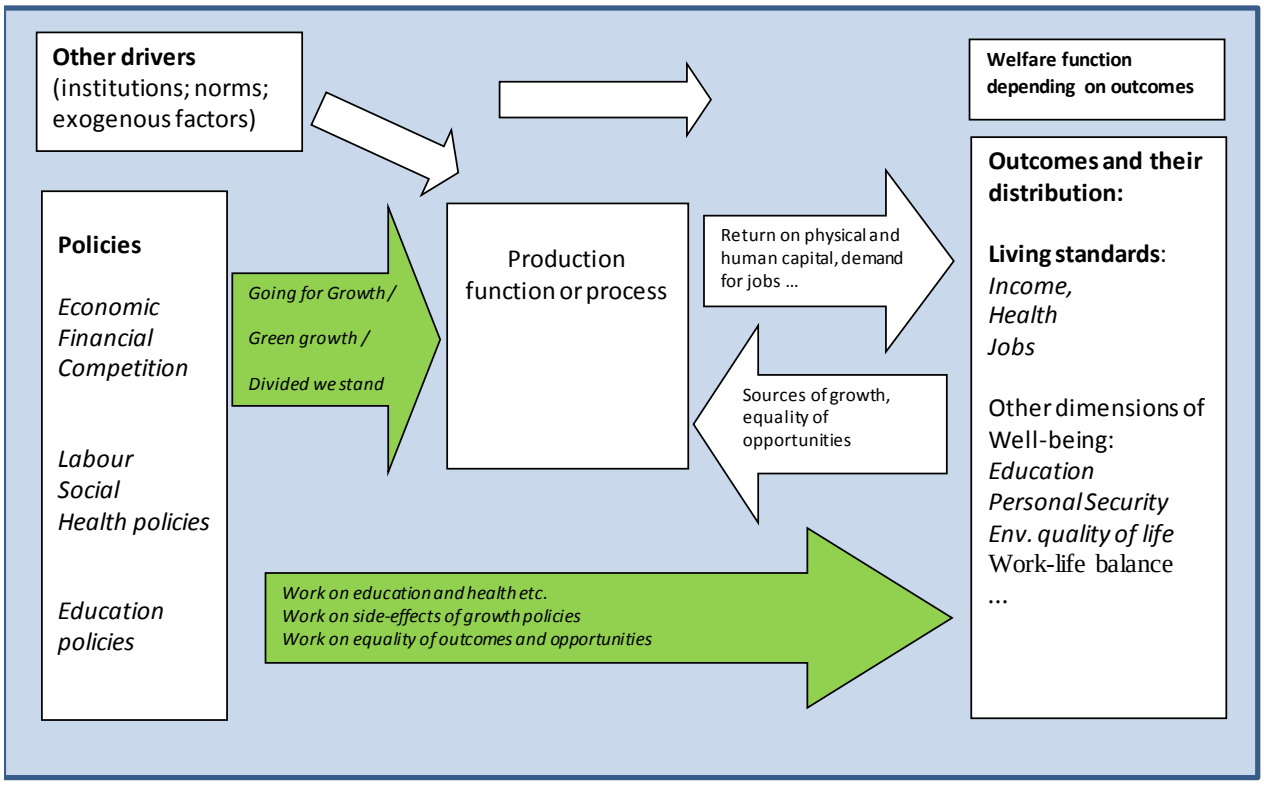
Finally, there are also policies directly targeted at the non-income dimensions of well-being, such as environmental, educational or health actions that aim at preserving air and water quality, raising skills and educational attainment, or improving the health status of the population. Once again, these policies may have side-effects on other outcomes that have to be investigated to gauge their full impact on multidimensional living standards. For example, higher public health spending can support a healthier population with potentially positive effects on employment and incomes, but it will also imply higher taxation and hence less material consumption. The ambition of the policy framework for Inclusive Growth is to bring these dimensions together in a coherent manner, where measurement, analysis and policy advice all keep an ultimate objective in sight: improving multidimensional living standards.

Against this background, the policy framework for Inclusive Growth pursues the following objectives. First and foremost, it should provide a clear link between individual dimensions of well-being and policies. In doing so, it should capture the policy influence on the key dimensions through both direct and indirect channels, so as to allow for richer policy interactions. Moreover, it should make explicit the main policy trade-offs and synergies so that policy makers can be better informed about relevant policy choices with respect to the different dimensions of multidimensional living standard. Finally, the framework should be sufficiently flexible to be adapted to country-specific challenges and circumstances.

[14] See OECD (2013d).

A summary description of such a framework is provided in Figure 6. The right-hand side of the diagram shows aggregate multidimensional living standards as depending on both the outcomes and their distribution along the income and non-income dimensions. The left-hand side of the diagram shows some of the policies potentially bearing on outcomes and their distribution. As the diagram indicates, there is a broad range of factors that mediate between policies and outcomes. Relevant OECD work is also highlighted in Figure 6.

Figure 6. Inclusive Growth: A framework for policy analysis



2.2. Assessing the impact of policies for Inclusive Growth

The previous sections have shown that performance differs qualitatively depending on whether it is measured in terms of multidimensional living standards or GDP per capita. Also, the influence of policies on Inclusive Growth is likely to differ from those on GDP growth, reflecting the multidimensionality of the former and the potential cross-effects among policy actions. In order for the framework to be both policy-oriented and evidenced-based, a number of criteria or constraints that condition the choice of dimensions need to be considered. In particular:

- An *understanding* of the key drivers of the outcomes included in the social welfare function is critically important. If outcomes are generated by processes that are not well understood and well defined, it will be difficult to link them firmly to policies.

- An *identification* of robust empirical relationships between multidimensional living standards and policies will be crucial for interpreting the effects of changes in policy on outcomes.

- Even if a relationship between outcomes and policy instruments can be identified, the estimated impact of policy instruments may be limited, making it less interesting from a policy point of view. Hence, the *responsiveness* of outcomes to policy intervention should also affect the choice of variables.

The extent to which these challenges can be addressed will depend on data availability and on the empirical methods applied. It will also be influenced by the degree of interconnectedness between different outcomes, inputs and policies. Taking into account the various possible linkages between policies and multidimensional living standards significantly increases complexity, which calls for considering at the outset a limited number of dimensions in the welfare function.

This section provides an illustration of the type of analytical framework that can be used to link outcomes to policies, taking into account both the level and distribution of outcomes. For simplicity, this is done for two of the three dimensions considered above: income and health. While the first contributes to material living standards, the second (measured in terms of life expectancy at birth) contributes to quality of life. The choice of these two dimensions is for illustrative purposes only, and as will become clear below, an explicit link to policies can be provided not only for the jobs dimension (employment or unemployment), as discussed above, but to other dimensions as well.

2.2.1. Modelling the links between policies and outcomes

To better illustrate the links between outcomes and policies, assume that a vector of outcomes (x) is generated by policies (q) and non-policy inputs (z), as well as other outcomes, such that:

$$\begin{aligned} x_1 &= g_1\left(q_1....q_N, x_2...x_M, z_1...z_O\right) \\ &..... \\ x_M &= g_m\left(q_1...q_N, x_1...x_{M-1}, z_1.....z_O\right) \end{aligned} \qquad (1)$$

The most immediate challenge in estimating system (1) is to identify the "production function" of each outcome. While standard models for GDP per capita are available, this is often not the case for other non-income dimensions. Such models need to be developed, and their empirical robustness needs to be tested in order to establish credible links to policies and assess the existence of trade-offs, side-effects and synergies across policies. Moreover, policies are assumed to affect endogenous inputs, which together with exogenous factors determine outcomes. While the role of policies and inputs is fairly straightforward, the interaction with other outcomes, in terms of both mean levels and distribution, is potentially more complex.

In part owing to these complexities, previous OECD work has focused on one material outcome, typically GDP per capita, and generally on a single measure of the distribution of that outcome, typically the mean. For instance, the focus of *Going for Growth* has been to provide country-specific recommendations on policies that would increase the long-run level of GDP per capita, although this relationship is analysed through a set of sub-indicators. The analytical and empirical underpinnings of *Going for Growth* have been elaborated and refined to a large extent through supporting OECD work in different policy areas. More recent OECD work (*Going for Growth 2013*, chapter 2) has started to look at side-effects of pro-growth policies on income inequality and the environment, but without any attempts to consolidate the aggregate welfare effects or to model potential inter-linkages between these different dimensions. In addition, in *Divided We Stand*, the focus has instead been on identifying policies and other drivers of shifts in the distribution of income in OECD countries.

2.2.2. Linking policies to outcomes: the case of household income and life expectancy

To simplify the empirical analysis, it is assumed that for both dimensions (income and health), either only average levels matter or that the level and distribution of the outcome have been combined into one indicator. This would yield an additive presentation of the social welfare function (illustrated in a simple diagram in Figure 7):

$$W = \bar{y}_\tau + p_{LE}\,\overline{LE}_\tau\,, \qquad (2)$$

where bars indicate general means (i.e. an aggregation across the distribution that allows for putting different weights on different segments of the distribution by setting the parameter τ with the arithmetic average as a special case), *y* denotes income, *LE* denotes life expectancy and p_{LE} denotes the shadow price to convert outcomes into monetary equivalents.[15]

Figure 7. Multidimensional living standards defined over two dimensions

The need to identify a robust framework linking outcomes to inputs and policies raises one issue as regards the choice of a proxy for income. From a well-being perspective, the traditional focus on GDP per capita as a suitable proxy of household income has been increasingly called into question, despite its many practical advantages. For instance, the widening gap between GDP and average household income observed in many OECD countries suggests that even as a proxy for mean living standards, GDP falls short of representing the concerns of the typical individual or household (Atkinson, 2011). Indeed, giving more prominence to household disposable income as opposed to GDP per capita has been one of the main recommendations of the Stiglitz-Sen-Fitoussi Commission (2009). Moving even closer to the concerns of a majority of citizens would argue for making use of a measure of household "spendable" income, where the National Accounts measure of disposable income is adjusted to remove a number of imputed income components (Atkinson, 2011).

From a measurement perspective, it is possible to move away from GDP per capita to an adjusted concept of household disposable income, especially if National Accounts remain the main source of data. Going one step further and taking into account the equity aspect requires moving beyond the concept of mean income based on National Accounts data to using survey data on household incomes across the whole distribution. In this context, the influence of policies on income inequality could be examined separately from that on the average level of income, taking an approach similar to that followed in *Divided*

15 As shown in the Technical Annex, the term $\bar{y}_\tau$ corresponds to $\bar{y}_\tau = \bar{y}(1+I)$ where $\bar{y}$ is the arithmetic mean income and I is the Kolm-Atkinson inequality adjustment. Similarly, distribution-adjusted life expectancy is composed of average life expectancy and the inequality adjustment: $\overline{LE_\tau} = \overline{LE}(1+I)$.

We Stand and other recent OECD work.[16] Accordingly, the level and distribution of income would be treated as separate elements of the social welfare function to be aggregated along with other dimensions of well-being.

The main difficulty, however, is that while the link from policies to income is well established in the case where the latter is measured by GDP per capita, it is far less obvious when household income is used as a proxy. Also, adapting the analytical framework for assessing the role of policies is not straightforward. For instance, one cannot simply apply the traditional growth model and production function directly to household disposable income as this is not well grounded in economic theory, even though one would *a priori* expect changes in household income to be associated with changes in factor inputs and multi-factor productivity.

One avenue would be to invest in the development of the relevant production function for household income, a task that falls beyond the scope of this note. An alternative approach consists of looking jointly at the two income concepts and examining the extent to which growth in GDP per capita trickles down and benefits households across different income groups. More specifically, the idea is to investigate whether household incomes – on average and along the distribution – are jointly determined by the same set of structural policies as GDP. Comparing the impact of policies on GDP as well as on household incomes and their underlying distribution may allow for identifying potential policy trade-offs and complementarities with respect to the objective of raising both efficiency and equity.

In order to be able to consider both the mean and the distribution of income in the welfare function and policy analysis, it is desirable to use measures of household income following the income standard approach developed in Foster and Székely (2008) and defined in Section 2 above (see in particular Box 4). The main benefit is that income standards are evaluated so as to emphasize progressively different parts of the distribution. As mentioned above, median household income is a simple and intuitive measure that implicitly puts lower weights on incomes at the high-end of the distribution (at least in the common case of skewed distributions). If one wishes to focus on the lower end of the distribution, another possibility is to take the mean income of the lowest quintile. However, both are special cases among a broad range of income standards that can be measured based on the *general means* concept defined in Atkinson (1970).[17] The advantage of a more general approach such as, for instance, the bottom-sensitive income standard is to avoid restricting attention to income below an arbitrary cut-off point while ignoring income beyond that point.

From production to income taking into account distributional aspects

The first step in analysing the links between outcomes and policies is to establish the set of relevant exogenous factors and policies that enter the "production functions". As mentioned earlier, in the case where income is proxied by GDP per capita, the analysis has typically been anchored in Cobb-Douglas or CES-type production functions, which have provided a natural and fairly coherent framework for assessing the influence of policies through a number of intermediate drivers, such as those illustrated in Figure 8. In this case, policies feed through the two main proximate determinants – labour productivity and employment – as well as via a number of intermediate drivers, which include investment in physical, human and knowledge (e.g. R&D spending) capital. This framework can be interpreted as providing the policy determinants of production or income generation.

16 See Chapter 5, OECD (2012).

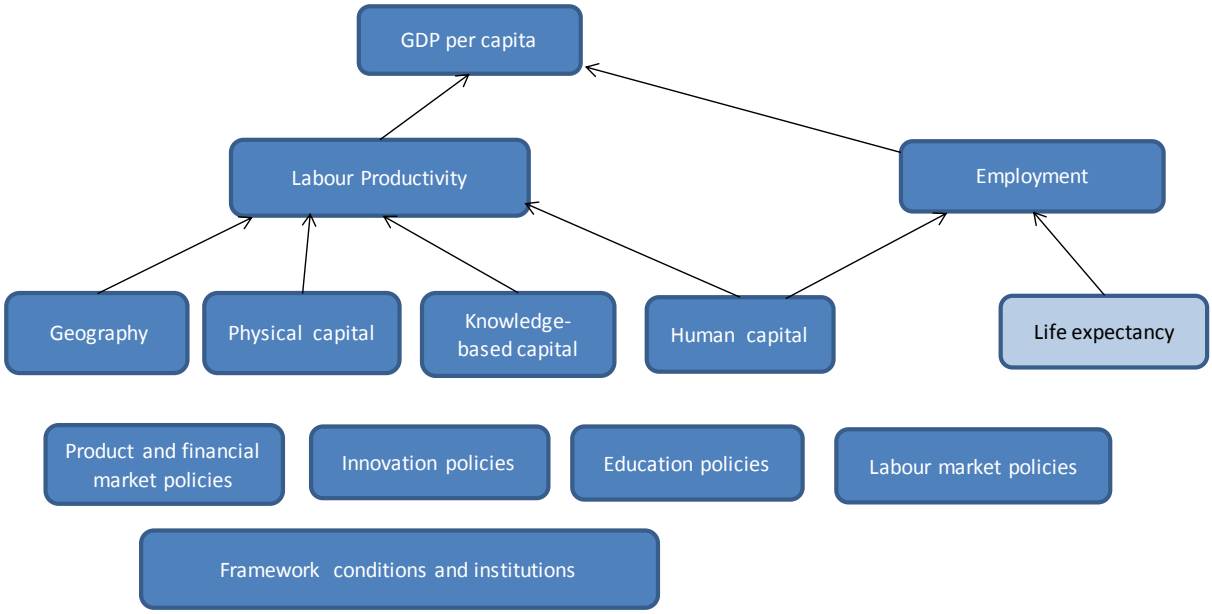
17 In Foster and Székely (2008), the income standard is defined as a "function that summarises the entire distribution in a single income level that indicates the general affluence of the distribution or the affluence of some part of the distribution".

Underpinning policies are a number of framework conditions and institutions whose impact feeds through multiple channels. Elements of geography, such as proximity to major markets and endowments in natural resources, are examples of exogenous factors affecting labour productivity and GDP per capita. Also, aside from their direct impact on well-being through improved quality of life of citizens – independently of whether they are engaged in market activities or not – better health outcomes influence well-being indirectly through their impact on workers' productivity, on career length (relative to life expectancy) and hence on income. More formally, assume that GDP (per capita) is generated by:

$$\overline{gdp} = F\left[k, h, mfp, empl, q_y, z_y\right] \qquad (3)$$

where $\overline{gdp}$, k, h, mfp and $empl$ denote, respectively, average GDP, physical capital, the stock of human capital, multifactor productivity and the ratio of employment to working-age population; z_Y denotes exogenous factors such as geography; and q_Y is a vector of policies influencing directly GDP per capita after controlling for inputs.

Figure 8. The link between policies, inputs and income



Based on this framework, a number of studies have estimated the effects of policies *directly* on GDP by augmenting the traditional Solow growth equation with policy variables and other intermediate drivers, such as R&D spending or measures of trade openness.[18] In these studies, investment in various forms of capital, as well as policies and institutions, are generally assumed to have a permanent impact on the long-run *level* of output and can help to explain cross-country divergences in GDP per capita, while the effects of policies on the *rate of growth* of output are assumed to be temporary.

Many other studies have examined the impact of structural policies on GDP *indirectly* through their influence on proximate determinants (labour productivity and employment rates or hours worked), as well as through intermediate drivers, such as external trade, education and innovation. In order to shed more

18 OECD studies include Bassanini *et al.* (2001), OECD (2003), Arnold (2008), Boulhol, de Serres and Molnar (2008), Bouis, Duval and Murtin (2012).

light on the microeconomic channels through which policies and institutions ultimately affect economic growth, empirical analysis has often been conducted at the sector or firm level (productivity) or for sub-groups of individuals (labour force participation, employment or unemployment). By and large, this type of analysis has provided the empirical underpinnings for *Going for Growth* (Box 8).

The main advantage of the indirect approach is to allow for a richer set of policies to influence production and income through better identified channels. However, this comes at the cost of higher complexity and – given the partial-equilibrium nature of the system – the risk of over-estimating the effect of policy instruments that feed through more than one channels. More specifically, in order to quantify the impact of policies through the determinants of the production function, the empirical framework can be augmented with estimated relationships linking physical capital (k), human capital (h), multi-factor productivity (mfp) and the employment rate ($empl$) to their policy (and non-policy) determinants.[19] For estimation purposes, GDP per capita is thus decomposed into its main drivers:

$$k = F_k\left[P_I, (r-\pi), q_I, z_I\right], \quad (3a)$$

$$h = F_h\left[Cost, RTE, q_H, z_h\right], \quad (3b)$$

$$mfp = F_{mfp}\left[Trade, R\&D, q_{mfp}, z_{mfp}\right], \quad (3c)$$

$$empl = F_{empl}\left[LE, S^{youth}, q_{empl}, z_{empl}\right], \quad (3d)$$

where P_I and $(r-\pi)$ denote the relative price of physical capital and the real interest rate, respectively; $Cost$ and RTE measure private costs and returns to higher education; $Trade$ captures openness to foreign trade and investment, while $R\&D$ stands for business R&D spending, but it could also be taken as a broader measure of investment in knowledge-based capital, reflecting for instance business spending on database development, design, branding and organisational capital; LE and S^{youth} reflect life expectancy and the educational attainment of the young cohort, respectively; q_I, q_H, q_{mfp} and q_{empl} capture the policy determinants of the respective drivers, while z_I, z_H, z_{mfp} and z_{empl} represent exogenous factors. Depending on the policy driver, the range of areas that is considered could include product and labour market regulations, taxation and social protection, education and training (activation) policies, trade and investment rules, measures to boost investment in innovation as well as environmental policies.

As mentioned earlier, if the causal link from policies to GDP and income is better understood through the production function and the determinants of GDP, the income measure that ultimately matters from a multidimensional living standards perspective is household disposable income. As shown in Figure 9, growth in both mean and median household income lagged that of GDP in many countries during the pre-crisis period. Hence, in moving from income generation to income distribution, it is important to understand how changes in GDP relate to changes in household disposable income, not only at the mean level but also at different points of the distribution. To do so, the framework is completed by two alternative sets of equations, which differ according to whether household income is linked directly to GDP or to its main components:

$$\bar{y}_\tau = G[\overline{gdp}, q_y, z_\mu], \quad (3e)$$

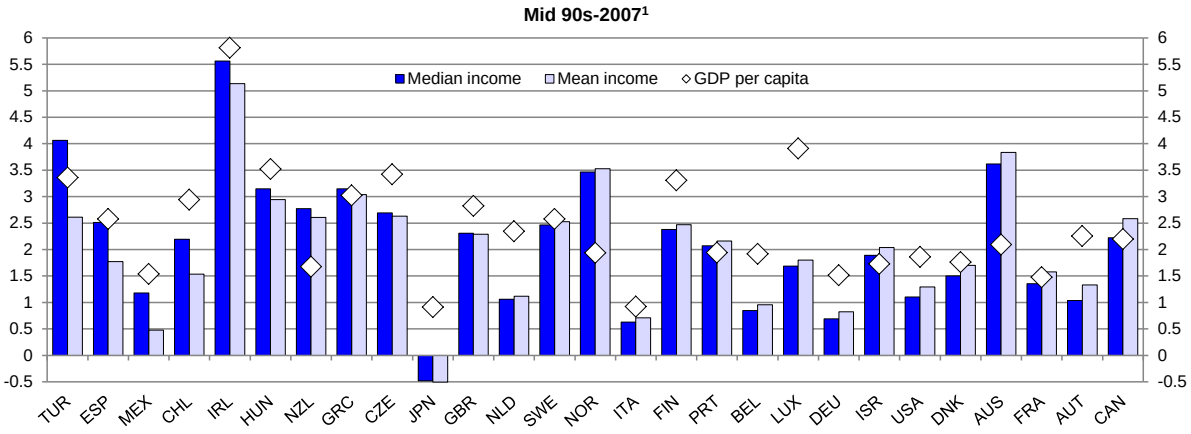
$$\bar{y}_\tau = H[k, h, mfp, empl, q_y, z_\mu], \quad (3e)'$$

[19] For purposes of linking outcomes to policies, employment could be further decomposed into unemployment and labour force participation rates.

where $\bar{y}_\tau$ is generalised average household disposable income that varies according to the weight put on different segments of the distribution, as mentioned above; z_μ captures non-policy factors, such as corporate savings, and which can drive a wedge between GDP per capita and household incomes over a prolonged period; q_y is introduced in both cases to allow for the possibility that a number of policies may have a significant impact on household income over and above their indirect effect through GDP (3e) or its main determinants (3e)'.

For the purpose of Inclusive Growth, equations (3e) and (3e)' can be estimated for income standards that correspond to mean income, geometric mean income (empirically close to the median) and a value that is empirically close to the mean income of the poor, where the latter is defined in relative terms.

Figure 9. Growth in mean and median household income before the crisis



Note: For median and mean equivalised household disposable incomes, Purchasing Power Parities (PPPs) are those for private consumption of households. For GDP per capita, PPPs are those for the GDP deflator. Countries are sorted in ascending order according to the difference between the annual average growth rates of mean and median disposable incomes.

1. "Mid 90s" refers to 1995 except for Austria for which the data refer to 1993, for Czech Republic, France, Luxembourg and Chile for which the data refer to 1996, for Greece, Ireland, Mexico, Turkey and the United Kingdom for which the data refer to 1994. "Late 2000s" refers to 2009 except for Australia, Canada, Denmark, France, Germany, Israel, Mexico, the Netherlands, Norway, Sweden, the United Kingdom and the United States for which the last available observation is 2010, for Korea for which it is 2011 and for Switzerland for which it is 2008.

Source: OECD calculations based on OECD National Accounts and Income Distribution (databases).

Box 8. The *Going for Growth* framework: Mapping the impact of policies on GDP per capita

Since 2005, Going for Growth has provided OECD members (and more recently a number of partner countries) with analysis and policy recommendations on how to change structural policy settings in order to raise long-term GDP per capita. Going for Growth also follows up on progress on previous recommendations and has more recently started to look at the effects of pro-growth policies on income distribution (see OECD, 2014c). The Going for Growth framework provides insights into how Inclusive Growth can be connected to policies, and it also points to potential pitfalls.

GDP per capita is the composite outcome measure in the Going for Growth framework. GDP per capita is decomposed into labour utilisation and labour productivity. Labour utilisation is then further decomposed into employment rates and average hours worked per employee, while labour productivity is decomposed into multi-factor productivity and capital intensity (in particular ICT investment), assuming a standard Cobb-Douglas production function. This standard decomposition can be seen in the right-hand side of Figure 8, bearing in mind that the decomposition is sometimes pursued to further levels of disaggregation.

The starting point of the selection process is a detailed examination of labour utilisation and productivity performance along with some of their underlying components, so as to uncover specific areas of relative strength and weakness for individual countries. Each performance indicator is juxtaposed with corresponding policy indicators to determine where performance and policy weaknesses appear to be linked. The matching of specific policies and performance areas is made on the basis of empirical analysis uncovering a significant link between the two variables, generally on the basis of reduced-form (panel) regressions, where the impact of several policy and non-policy determinants on a specific area of performance is jointly estimated. The work to establish links between outcomes and policies is typically vetted by relevant OECD committees to ensure quality and buy-in from member countries.

For instance, in the case of productivity performance, based on empirical evidence provided in Bourlès et al. (2010) and Arnold et al. (2008), multifactor productivity growth (performance indicator) is benchmarked against specific areas of product market regulation, such as administrative burdens on start-ups or barriers to entry in retail or professional services (policy indicators). In the case of labour utilisation performance, aggregate employment (performance indicator) is benchmarked for example against the level of the labour tax wedge (policy indicator), while female employment (performance indicator) is benchmarked against childcare-related costs embedded in tax and benefits systems (policy indicator). The empirical underpinnings of these relationships are supported by the findings of several studies, including Bassanini and Duval (2006) and Jaumotte (2004). In principle, the net effect of each policy on GDP per capita can then be gauged through the various channels, providing information on policy synergies across different performance areas (e.g. a number of policies can be found to have a favourable impact on both productivity and employment, at least for specific groups) and complementarities among different policy interventions (though this is often harder to estimate).

The growth accounting framework behind Going for Growth is well established and accepted. Still, there is room for improvement. First, although similar methods are used to derive relationships between policies and outcomes, data availability (and timing of estimation) means that different data samples may be used. Relations between outcomes and their related policies are therefore identified using different data samples. This also means that simultaneous estimation of component equations is difficult. Second, reliance on cross-country panel analysis for verification is quite demanding in data terms. This means that the set of policy variables that can be included is limited, restricting the range of policy recommendations. The recommendations in Going for Growth based on the above-described framework are therefore accompanied by additional recommendations, which are not directly anchored in the framework. Such additional recommendations are often drawn from country-specific expertise, for example based on analysis conducted in Economic Surveys.

While the Going for Growth framework could complement that of Inclusive Growth, the methodological hurdles that will need to be overcome to carry out the analysis should not be underestimated. The growth accounting framework is a well-established workhorse, but a similar consensus on the arguments and weights of social welfare functions has yet to be achieved. Furthermore, in the case of other dimensions of well-being the links between policy settings and sub-components has often not been investigated empirically. Thus, significant work will need to be done to map structural policies to average outcomes in all the non-monetary dimensions that matter for Inclusive Growth, as well as to the joint distribution of inequalities in monetary and non-monetary dimensions.

Health and life expectancy

In the case of life expectancy, a production function approach can be (and in fact has been) used to describe the links with input (intermediate drivers) and policies (see OECD, 2008*b*, for references). As illustrated in Figure 10, aside from the provisions of health care services, the main inputs include pollution, lifestyle and education. Average income also influences life expectancy in this framework through a number of channels. For instance, while higher average income allows for more resources to be spent on health, income is generated at least in part through activities that contribute to pollution and, thus, affect negatively health outcomes and life expectancy. Education can play a role over and above its impact on income through increased awareness and more effective use of health services. Although not explicitly mentioned in Figure 10, a number of social factors, such as poverty, exclusion, discrimination and job insecurity, have been found to be important determinants of the population's health status. Insofar as they correlate with other well-being dimensions, such as income inequality, they are captured to some extent in the proposed framework.

More formally, average life expectancy can be modelled as:

$$\overline{LE} = F(\bar{y}, env, h, q_{LE}, z_{LE}), \qquad (4)$$

where env captures the effect of pollution, q_{LE} is a vector of policies which, in addition to (public) spending on health care, includes ideally factors affecting the efficiency of health care delivery and other potential longevity-enhancing policies; z_{LE} denotes a vector of factors linked to the lifestyle (*e.g.*, smoking, alcohol consumption and dietary habits), and which although they can be influenced by policies are treated as exogenous in this framework.

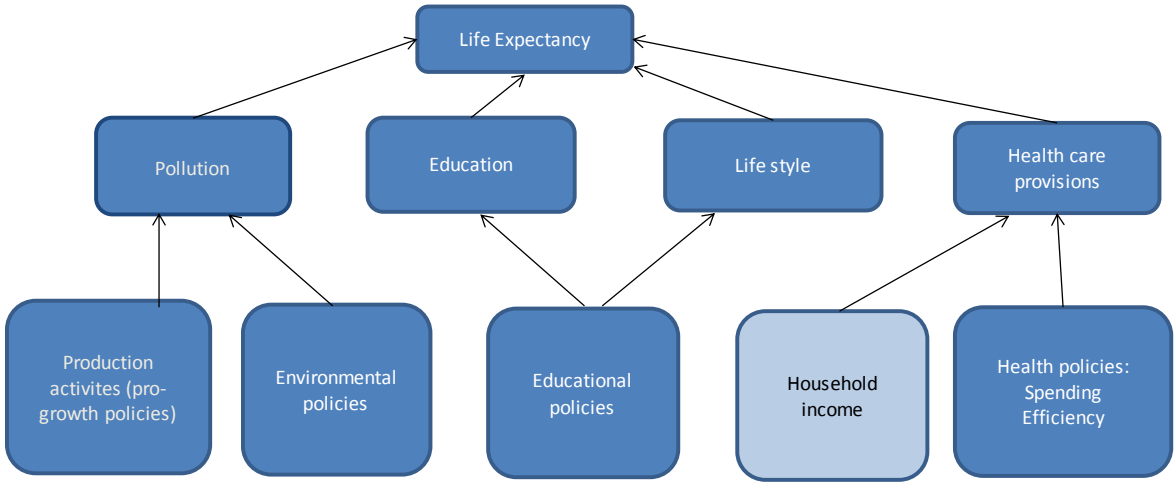
Among the many studies exploring the relationship between health and longevity, OECD (2010) attempts to analyse the policy drivers of life expectancy.[20] The framework can thus be completed with a relationship linking pollution to its main determinants, such that:

$$env = F(\overline{gdp}, q_{env}, z_{env}), \qquad (4a)$$

where q_{env} and z_{env} are vectors of environmental policies and exogenous factors causing pollution, respectively.

[20] The Health Division in the OECD Directorate of Employment, Labour and Social Affairs is currently exploring the effect of policies on health outcomes.

Figure 10. The link between policies, non-policy inputs and life-expectancy

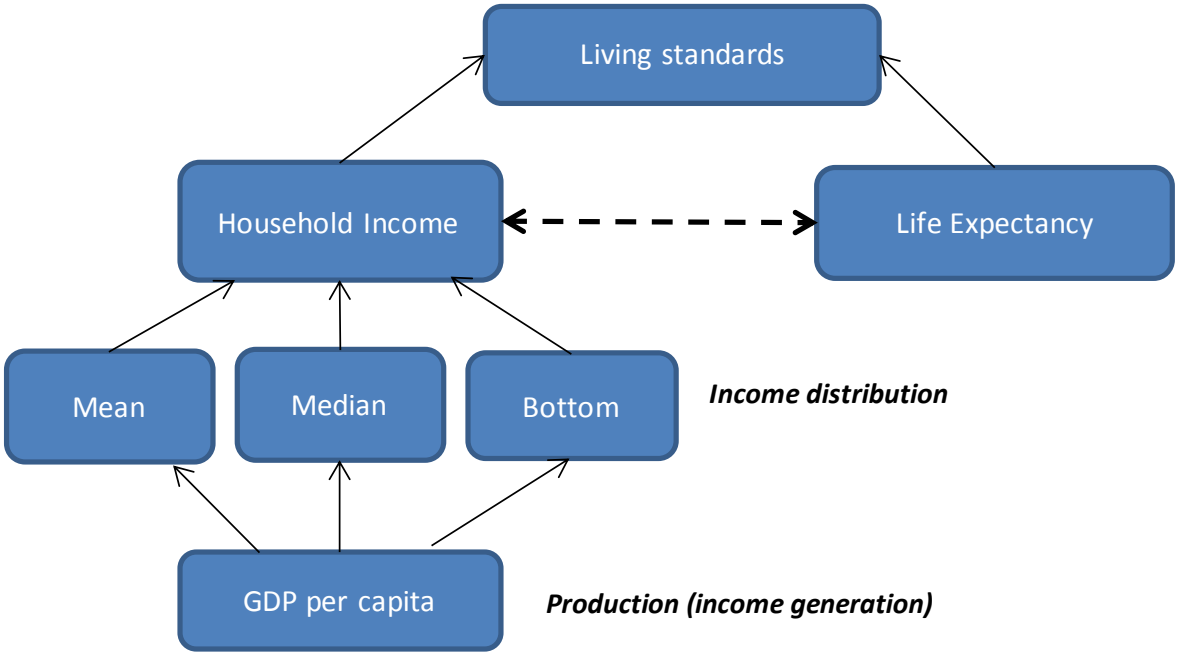


Taken jointly, Figures 8 and 10 illustrate the extent of potentially complex policy interactions even in a simple case where aggregate living standards are defined over two dimensions. In fact, the empirical approach going from production to (household) income, and from income and life expectancy to living standards is illustrated in Figure 11, which highlights the feedback loops that may exist between income and life expectancy, and hence the degree of overlap in the set of inputs entering their respective production functions. This, in turn, creates scope for similar policy instruments to influence living standards through multiple, sometimes offsetting, channels. For instance, growth-oriented policies that successfully raise the income of the majority of households will at the same time benefit life expectancy through higher spending on health, but such benefits may be offset if growth entails severe air or water pollution. Conversely, environmental policies may result in lower GDP per capita and income but still lead to higher multidimensional living standards through improved health status and life expectancy.

In a similar vein, to evaluate the contribution of health policies to multidimensional living standards, it is necessary to gauge their relative impact on both life expectancy and income. While the former may be relatively straightforward, the latter is much less so. To see this, take the example of health spending. Higher health spending raises life expectancy, suggesting that a doubling of health spending as a share of GDP would increase life expectancy at birth by 4%, which points to a significant welfare gain. At the same time, however, an increase in health spending would have several – sometimes mitigating – effects on GDP per capita (and in turn on mean household income).

First, higher health spending may crowd out other types of private or public consumption. Second, health spending has a direct effect on GDP per capita through the growth accounting framework described in Box 4. To see this, note that health spending has a stronger impact on life expectancy at 65 compared to at birth. This means that, unless working life is adjusted in proportion to life expectancy, higher health spending will tend to increase life expectancy in the working-age population less than for the non-working age population, thereby lowering employment rates and hence GDP per capita. Finally, increasing health spending may have indirect but hard-to-estimate effects on GDP, for instance through lower sick leave and disability (increasing average hours and therefore GDP per capita) or higher tax rates (lowering employment rates and therefore GDP per capita). A fuller analysis of the impacts of health spending on GDP per capita would therefore need further estimates, e.g. in terms of sick leave.

Figure 11. From production to income to multidimensional living standards



2.3. An illustration of the empirical approach: the case of GDP per capita and household disposable income

For purposes of illustration, this sub-section provides preliminary results from looking at the joint effect of a selection of structural policies on GDP per capita and household incomes, on average and across the distribution (see Causa, de Serres and Ruiz, 2014), for more details on methodology and results). More specifically, it investigates the extent to which structural policies have differential long-run impacts on GDP per capita and household incomes at different points of the distribution, focusing on the lower part of the distribution. For illustrative purposes the results are reported for selected labour market policies and drivers of globalisation. For this purpose, the effect of policies on GDP per capita is estimated *directly* by augmenting the traditional Solow growth equation with policy variables, rather than *indirectly* through the intermediate drivers. Extending the empirical analysis to the full system (2) to (4) and to a broader set of policy determinants is the object of ongoing work.

2.3.1. The baseline model

The baseline model builds on the joint estimation of GDP per capita and household income equations (Box 8). The GDP per capita specification is based on the augmented-Solow model (Mankiw, Romer and Weil, 1992) and therefore the long-run determinants of GDP are human and physical capital, labour-augmenting efficiency (captured by a time trend) and population growth.

Household disposable income is measured on the basis of general means, a particular form of income standards developed by Foster and Székely (2008), following Atkinson's framework for measuring inequality. The household income specification is based on the assumption that in the long run the level of income is mainly driven by the level of GDP per capita. In addition to the level of GDP per capita, the baseline household disposable income specification includes a proxy for terms of-trade fluctuations and country-fixed effects. A previous study showed that the contribution of terms-of-trade fluctuations to the gap between real GDP per capita and average household disposable income was particularly large in

commodity-exporting countries, and that it could also be significant elsewhere (Causa, de Serres and Ruiz, 2014).

Finally, the household disposable income specification also includes country-specific time trends to control for potential distortions due to data limitations such as the under-reporting of top incomes (in particular thee top one per cent) and the non-inclusion of capital gains as a source of incomes. These two factors could have contributed in the past to the growing gap observed in many countries between GDP per capita and average household incomes, in particular in combination with two economic developments: a rising share of GDP being distributed in the form of profits (as opposed to wages) and a growing share of profits being saved by corporations and re-distributed in the form of capital gains rather than interest or dividends.[21]

To obtain a preliminary assessment of the distributional effects of structural policies, the specification for household disposable incomes is estimated at four different points of the distribution, again using the general means approach: in addition to the average level, the impact of policies is examined on levels closely corresponding to the median, the lower-middle class and the poor.[22]

From this GDP/household disposable income system, structural policy indicators can be introduced linearly in the two equations to assess their joint effects on GDP per capita and household incomes, thus covering a range of institutional settings that have been found previously to boost GDP per capita. The remainder of this section presents some evidence on the influence of selected labour market policies and drivers of globalisation.

2.3.2. Empirical evidence on selected labour market and welfare policies

Labour market policy reforms are often designed to boost aggregate employment through behavioural effects, such as labour supply incentives, and *via* this channel, GDP per capita. At the same time, these policies also affect the distribution of earnings. For some reforms, these two effects on income distribution may be offsetting each other. For example, recent evidence suggests that reducing unemployment benefits and lowering statutory minimum relative to median wages are associated with both higher wage dispersion and higher employment rates (among low-skilled workers), which may result in a very small net change on distribution among the working-age population.[23] For other reforms, however, wage and employment effects may reinforce each other, resulting in both stronger growth and less inequality. This could be the case of policy reforms aimed at facilitating the return to work of unemployed through intense job search assistance and other activation measures. This section summarises some of the main findings from the empirical analysis (see Box 9 for a description of the approach), which are reported in Table 3.

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21 The trend rise in the profit share of GDP per capita would imply that associated income transfers from the corporate to the household sector increase for shareholders–generally households in the upper-end of the income distribution. In turn, an increase in the portion of profits that is distributed through capital gains (re-invested profits, share buy-backs, etc.) means that a growing share of household income is under-reported due to the treatment of capital gains.

22 These levels are obtained from selecting four values for the parameter τ in the equation of Box 4.

23. See OECD (2011a) and Koske et al. (2012).

Box 9. The baseline model: structural econometric modelling of GDP and household incomes across the distribution

The baseline specification takes the following form:

$$\Delta \ln(GDP_t) = \beta_0 - \beta_1 \ln(GDP_{t-1}) + \beta_2 \ln(s_t) + \beta_3 \ln(h_t) - \beta_4 n_t + \beta_5 t + \delta_1 \Delta \ln(s_t) + \delta_2 \Delta \ln(h_t) + \delta_3 \Delta \ln(n_t) + \varepsilon$$

$$\Delta \ln(\mu_\alpha(x_t)) = = \eta_{0,\alpha} + \eta_1, \alpha \ln(TT_t) + \eta_2, \alpha \Delta \ln(GDP_t) + \eta_3, \alpha \ln(GDP_t) - \eta_4, \alpha \mu_\alpha(x_{t-1}) + \upsilon$$

with $cov(\varepsilon, \upsilon) \neq 0$ and where:

- $\Delta \ln(GDP_t)$ is the variation in GDP per capita between year t and year t-1

- $\Delta \mu_\alpha(x_t)$ is the variation in income standards between year t and year t-1 for a given value of α, i.e. the parameter driving the emphasis on different parts of the income distribution. The baseline specification covers the entire income distribution as measured by top to bottom-sensitive income standards. Household income equations are therefore estimated for a continuous range of αs.

- s is the investment rate defined as the share of investment in productive capital over GDP

- h is the stock of human capital, measured as mean years of schooling

- n is the growth rate of the working age population

- TT measures terms of trade effects (i.e. changes in export relative to import prices). Terms of trade effects are accounted for in in consumer price deflators but not in GDP deflators. This variable is included as a control for one of the known and measurable sources of discrepancies between developments in GDP per capita and in household disposable incomes. See Causa, de Serres and Ruiz (2014) for recent evidence.

- ε et υ are error terms, assumed to be correlated across the two equations

These equations are estimated jointly by Seemingly Unrelated Regression Estimation (SURE) procedures. The GDP per capita and household income equations include country fixed-effects. The GDP per capita equation systematically includes a time trend and country specific time-trends. The baseline analysis is presented under two variants defined by a differential treatment of time in the household income equations: i) the household incomes equations are first estimated without and then ii) with time trends and country specific time-trends.

In the baseline setting, the parameters of interest are η_3, α/η_4, α and measure the household disposable incomes elasticity to GDP per capita for: i) average household income ($\alpha=1$) and ii) household incomes at different points of the distribution, as measured by top to bottom-sensitive income standards ($\alpha \neq 1$). The comparison of GDP per capita elasticities across α allows for assessing the distributional effects of GDP per capita growth.

The baseline estimations cover all OECD countries over the period from mid-80 s to late 2000s.

Source: Causa, O., A. de Serres and N. Ruiz (2014), "Can growth-enhancing policies lift all boats? A preliminary analysis based on household disposable incomes", *OECD Economics Department Working Papers*, OECD Publishing, Paris, forthcoming.

Table 3. The effects of labour market and welfare policies on GDP per capita and household disposable incomes across the distribution

	Unemployment benefit replacement rate, summary measure of generosity						Unemployment benefit replacement rate, long-term unemployment						Active labour market policies, spending on public employment services and administration					
	GDP per capita		Household incomes				GDP per capita		Household incomes				GDP per capita		Household incomes			
			Total effect		*Direct effect*				Total effect		*Direct effect*				Total effect		*Direct effect*	
Average income	-	*	-	*	-	*	-	**	-	*	*ns*		ns		+	**	+	***
Bottom-sensitive income standards																		
Median income			(- <)	**	*(- <)*	**			(- =)	*	*ns*				(+ =)	**	*(+ =)*	***
Income of the lower middle class			(- <)	**	(- <)	**			(+ >)	*	+	*			(+ =)	*	*(+ =)*	**
Income of the poor			(- <)	**	(- <)	**			(+ >)	*	*(+ >)*	**			(+ >)	*	*(+ >)*	*

Note: The entries of this table come from the estimation of the simultaneous effects of policies on long-term levels of GDP and household incomes across the distribution. Since GDP per capita is a determinant of household incomes across the distribution, the total effects of policies on the latter decompose as follows: (*i*) indirect effects, i.e. channelled via reform-driven GDP effects and (*ii*) direct (or additional) effects, i.e. over and above GDP effects. The tables systematically report: (*i*) the effects of structural policies on GDP per capita, which, by construction imply equivalent indirect effects on household incomes; (*ii*) the total (or net) effects of structural policies on household incomes, combining direct and indirect effects; (*iii*) the direct (or additional) effects of structural policies on household incomes. The policy indicators are entered in lagged levels in both the GDP and the household income equations. See Box 9 for details on the specification and econometric technique.

The entries can be read as follows. + denotes a positive policy impact while - denotes a negative one. The table also provides (statistical) comparison of estimated policy effects on household income standards at different points of the distribution, respectively the median, the lower-middle class and the poor, with policy effects on average household income. Hence, the cases >, < and = denote, respectively, a positive impact of the reform which is, for a given income group, statistically higher, lower, or equal than that on average income. For example, in the case of unemployment benefit replacement rate (summary measure of generosity), household income effects are negative for all income groups and they are more negative for median income, incomes of the lower middle class and incomes of the poor, in each case compared with average income. The symbols (*, **, ***) denote respectively statistical significance at 10, 5 and 1% t level.

Source: Causa, O., A. de Serres and N. Ruiz (2014), "Can growth-enhancing policies lift all boats? A preliminary analysis based on household disposable incomes", OECD Economics Department Working Papers, OECD Publishing, Paris, forthcoming.

Unemployment benefits

The results provide evidence of a negative link between unemployment benefit levels and GDP per capita, suggesting that reductions in benefit generosity have tended to boost output. This finding holds at the level of average household income. But distributional effects are found to depend on whether the reform affects all unemployed workers or is targeted to the long-term unemployed:

- Untargeted reductions in replacement rates are found to raise GDP per capita and even more so household disposable incomes. In addition, the size of the effect on household income is similar across different points of the distribution. These results would tend to suggest that in the long run, employment gains[24] largely offset income losses from reduced transfers and increased wage dispersion, implying that unemployment benefit reforms could help boost incomes without widening inequality.

- Reductions in replacement rates targeted to the long-term unemployed (i.e. benefits for jobseekers in the fourth and fifth year of unemployment, which include additional social assistance transfers when those are available) are found to increase disposable incomes for the

24. For evidence on employment effects see e.g. Nunziata, (2002), Bassanini and Duval (2006), de Serres and Murtin (2013) Nickel *et al*. (2005), OECD (2011a).

median household but to reduce disposable incomes for the lower-middle class and, even more, poor households – unambiguously pointing to higher inequality.

The differential distributional implications associated with the two measures of benefit generosity could tentatively reflect that targeting unemployment benefit reforms to the long-term unemployed may deliver relatively less employment gains because the long-term unemployed have usually lower chances to find a job relative to the recently unemployed, reflecting compositional effects as well as skills erosion.

Active Labour Market Policies

Reforms of unemployment benefit systems are often formulated in combination with recommendations to strengthen active labour market policies (ALMPs) so as to enhance the efficiency of job-search support, activation and training programs for the unemployed. However, the macro effects of ALMPs are difficult to identify empirically,[25] because available expenditure-based measures fail to properly capture policy design or effectiveness and are very sensitive to the economic cycle. In fact, the estimates fail to identify a significant effect on GDP per capita. On the other hand, there is evidence of significant positive effects on average household incomes. This finding holds for household incomes down the distribution and associated income gains are found to be larger for the poor, pointing to equalising effects. This tentatively indicates that stepping up job-search support and programmes for the unemployed can increase jobseekers' employment chances and wages once in employment and, via this channel, reduce income inequality.

Selected drivers of globalisation

Economic globalisation involves increased exposure to international trade and financial movements, higher mobility of production factors (i.e. workers and capital) and often a more fragmented production process. If there is fairly broad consensus, especially in developed countries, that globalisation is growth-enhancing, this is far less the case about its distributional implications, where the evidence is more mixed. Indeed, the effects of globalisation on overall income distribution have mainly focused on the earnings dispersion channel, as opposed to the employment channel. Available evidence would seem to suggest that globalisation-induced inequality effects are mainly driven by the wage dispersion channel, in particular arising from changes in the skill and industry composition of labour demand.[26]

For mature economies, the distributional impacts of globalisation would come through a variety of channels such as: (*i*) increased wage dispersion resulting from import competition from low-wage countries, (*ii*) growing outward investment reflecting the rapid development of international production-sharing (from home companies to their foreign affiliates) distorting the wage distribution of home countries by shifting relative demand within industries – the so called ''outsourcing hypothesis'',[27] *iii*) price reductions in goods that are disproportionately consumed by low-income households; *iv*) lower wage differentials resulting from increased demand for unskilled labour due to inward foreign investment in low-skill sectors in particular services (i.e. hotels and retail distribution) and; *v*) employment creation resulting for example from greenfield investment or innovation-induced increase in consumption. While the first two factors would tend to be less favourable to incomes at the low end of the distribution, the last three would in contrast be expected to benefit more low-income wage-earners and households.

25. See Kluve (2010) for a survey on the effectiveness of ALMPs to improve labour market performance. Vanhoult (1997) provides some evidence on inequality-reducing effects from higher spending on ALMPs.

26. See OECD (2011a) for references.

27. Feenstra and Hanson (2003); Hijzen (2007).

To shed light on these effects, the joint effects of export intensity, as well as FDI inflows and outflows on GDP per capita, and the four measures of household disposable incomes have been examined, using the same framework as for labour market policies.[28] The main results are presented in Table 4.

Table 4. The effects of globalisation on GDP per capita and household disposable incomes across the distribution

	Export intensity						FDI inflows						FDI outflows					
	GDP	Household incomes					GDP	Household incomes					GDP	Household incomes				
		Total effect		*Direct effect*				Total effect		*Direct effect*				Total effect		*Direct effect*		
Average income	+	**	+	***	*ns*		+	***	+	***	*ns*		ns		ns		*ns*	
Bottom-sensitive income standards																		
Median income			(+ =)	***	*ns*				(+ =)	***	*ns*				ns		-	**
Income of the lower middle class			(+ =)	*	+	**			(+ >)	***	+	*			-	*	*(- <)*	**
Income of the poor			(+ >)	**	*(+ >)*	**			(+ >)	***	*(+ =)*	*			(- =)	*	*(- <)*	***

Note: The entries of this table come from the estimation of the simultaneous effects of policies on long-term levels of GDP and household incomes across the distribution. Since GDP per capita is a determinant of household incomes across the distribution, the total effects of policies on the latter decompose as follows: (*i*) indirect effects, i.e. channelled via reform-driven GDP effects and (*ii*) direct (or additional) effects, i.e. over and above GDP effects. The tables systematically report: i) the effects of structural policies on GDP per capita, which, by construction imply equivalent indirect effects on household incomes; (*ii*) the total (or net) effects of structural policies on household incomes, combining direct and indirect effects; (*iii*) the direct (or additional) effects of structural policies on household incomes. The policy indicators are entered in lagged levels in both the GDP and the household income equations. See Box 9 for details on the specification and econometric technique.

The entries can be read as follows. + denotes a positive policy impact while - denotes a negative one. The table also provides (statistical) comparison of estimated policy effects on household income standards at different points of the distribution, respectively the median, the lower-middle class and the poor, with policy effects on average household income. Hence, the cases >, < and = denote, respectively, a positive impact of the reform which is, for a given income group, statistically higher, lower, or equal than that on average income. For example, in the case of export intensity, household income effects are positive for all income groups and they are of equal size for median income and incomes of the lower middle class, while they are higher for incomes of the poor, in each case compared with average income. The symbols (*, **, ***) denote respectively statistical significance at 10, 5 and 1% t level.

Source: Causa, O., A. de Serres and N. Ruiz (2014), "Can growth-enhancing policies lift all boats? A preliminary analysis based on household disposable incomes", OECD Economics Department Working Papers, OECD Publishing, Paris, forthcoming.

Stronger export intensity is found to boost long-run GDP per capita and average household disposable income. Such effects hold across the distribution of household income, but with significantly stronger estimated gains for the poor. The stronger positive effects of export intensity on lower income households are broadly consistent with previous empirical literature (e.g. Jaumotte *et al.*, 2008, and Koske *et al.*, 2012) pointing to the positive effects of international competition on GDP and employment.[29]

The results on the impact of international financial integration through FDI flows are more mixed:

- The influence of inward FDI is qualitatively close to that of export intensity, a likely reflection of the interplay between trade and FDI and the resulting difficulty to properly identify their isolated effects: there is evidence of positive effects on GDP per capita and positive equalising (both indirect and direct) effects on household disposable incomes. This finding could reflect FDI-

28 The measures taken are based on previous OECD work (Chapter 2 of OECD, 2011a), and accordingly the estimation is done by controlling for concomitant structural shifts affecting the composition of OECD economies, e.g. in terms of the sectoral (agriculture, industry and services) as well as the share of women in total employment.

29. In the latter case the paper measures overall trade as a share of GDP and does not disentangle imports and exports effects.

induced demand for unskilled labour and associated employment creation, and it would suggest that policy reforms aimed at easing barriers to entry for foreign firms could both raise efficiency and incomes of the less-well off.

- The impact of outward FDI is significant on neither GDP per capita nor average household income. By contrast, there is some evidence of negative effects on household incomes of the lower-middle class and the poor. These effects are consistent with the outsourcing hypothesis.

2.3.3. Summing up

The above results do illustrate that some policies that are favourable to GDP per capita and/or average household disposable incomes in the long term can have much less beneficial impact on the incomes of households at the lower end of the distribution. This would be the case of reductions of support benefits for the long-term unemployed and of policies that favour FDI outflows. In both cases, the results point to a decline in the income of poorer households, even as the average household income increases. However, the analysis also points to combination of reforms that would mitigate or offset these effects. For instance, reforms of unemployment benefits would be best considered in a context where activation policies are stepped up. Likewise, the adverse effects of FDI outflows may not materialise if measures are taken to encourage stronger inward investment.

3. Extensions and way forward

The policy framework for Inclusive Growth as presented above can be extended over time in different directions. First and foremost, additional non-income dimensions could be considered in the computation of multidimensional living standards, depending on country preferences and circumstances, as well as data availability. Extensions could include education and environment, as discussed above, but also the role of family life, which has a strong impact on people's subjective well-being and is strongly affected by varying economic conditions (Easterlin, 2013). Informal networks are also important in preserving people's welfare against adverse shocks in developing and emerging market economies, where formal social protection systems are in general incipient.[30]

Over time, it may also be useful to gauge the effects of policies on social groups other than the median, the lower-middle class and poor households, as in the current framework, depending on country circumstances and preferences. It may be useful to inform the policy debate about the effects of structural reforms on wealthier population groups, such as the upper-middle class and those households with income at the top decile of the income distribution. A broader set of reference points, or representative households, would complement the analysis by shedding light on the evolution of multidimensional living standards along the entire income distribution.

Another promising avenue for extending the policy framework for Inclusive Growth is related to sustainability considerations. For example, based on the framework described above, Inclusive Growth refers essentially to the current distributional effects of policies and does not directly reflect inter-generational concerns and aspects of inter-temporal sustainability. Sustainability involves maintaining or increasing the different types of capital stocks (physical, knowledge-based, natural, human and social) that underpin the various dimensions of well-being. For instance, economic, human, physical and knowledge-based capital support not only job creation and household income but also health and skills. Similarly,

[30] It is unlikely that the current framework could be extended beyond country boundaries to account for global inclusiveness (i.e. transboundary redistribution of wealth). Indeed, it would be very complicated to aggregate preferences across different countries as weights of non-material dimensions vary across countries (i.e. they depend on income national levels), and so does aversion to inequality.

natural capital also provides services to market production in the form of sinks or natural resources, thereby supporting jobs and income as well as environmental quality of life. Social capital may support jobs and earnings as well as social connections, subjective well-being and so forth.

Moreover, while the dimensions of well-being that underpin the policy framework for Inclusive Growth framework are relevant to mature societies, it is important to reflect the needs and specific circumstances of emerging market economies and developing countries. Indeed, well-being initiatives in developing countries tend to identify similar non-income dimensions, although national and regional priorities and contexts often lead to different emphasis and specific measures for each dimension. For example, as discussed above, education may play a predominant role that needs explicit consideration. In some countries, where labour informality is pervasive, it is important to understand how the jobs dimension is affected by duality in the labour market. Providing evidence of the aspects of well-being that are of greatest relevance to countries at different levels of development, and of the elements shaping the sustainability of outcomes along those dimensions, is one of the goals of the OECD Development Centre's ongoing *multidimensional country reviews.*

Qualitative tools could complement the analysis for those countries where data constraints would prevent the full implementation of the policy framework for Inclusive Growth. While the methodology for measuring multidimensional living standards and identifying policy tools for Inclusive Growth is directly applicable to emerging market economies and developing countries, and relates to the discussion on pro-poor growth in the field of development economics, the availability of statistical information may pose constraints to appropriate measurement. This would call for complementary analysis, which could be based on the use of a limited, readily available number of indicators to describe outcomes along the key dimensions that mater for Inclusive Growth and specific policy settings.[31] These indicators could be used to identify salient features of the linkages between policies and multidimensional outcomes on the basis of a "clustering" of country experiences. Such a cluster approach would constitute a first, qualitative step towards linking policies and multidimensional outcomes that matter for Inclusive Growth in developing countries.

At the same time, the policy framework for Inclusive Growth needs to be complemented by analysis at the regional, sectoral and national levels. These complementary strands of work are important, because they allow for a better understanding of the role played by local preferences, circumstances and institutional settings on policy design and implementation. They can also shed light on the specific features of sectoral policies and their effects on outcomes that would not be possible to achieve at the cross-country level. Moreover, taking account country-specific policy experiences is an important step in complementing the cross-country analysis and allowing the policy framework to respond to concrete reform packages in individual countries.

Finally, more work can be carried out on the political economy aspects of the design and implementation of policies for Inclusive Growth. An important feedback loop from the different well-being dimensions to policies that is not directly addressed in the current framework is the political process whereby civil society affects policy formulation and implementation, and which could be referred as the "citizens' voice". Public manifestations or social tensions in conjunction with the distribution of income and wealth (e.g. "99 percent", "Los Indignados") are examples of the importance of this feedback loop, as are more institutionalised channels of the political process, such as elections and governance institutions more generally. Avoiding capture of the policymaking process by interest groups is also important and calls for adequate policy settings and governance structures. It is therefore important to understand better

[31] For example, Anand, Mishra, and Peiris (2013) developed a measure of Inclusive Growth and, by clustering countries, identified country-specific barriers to improving living standards.

the institutional settings that are most conducive to active participation of different social groups in the policymaking process and also facilitates the implementation of policies for Inclusive Growth.

TECHNICAL ANNEX: MEASURING INCLUSIVE GROWTH:

The construction of an aggregate measure of social welfare (or 'living standards', the label used in the work at hand) raises two problems. One is to define welfare at the individual level, the other one is to aggregate individual outcomes into a single measure.

Consider an individual *i* whose utility U_i depends on consumption goods $c_i=[c_1,\ldots c_M]$ purchased on the market at prices $p=[p_1,\ldots,p_M]$ and a set of non-material outcomes such as health, education, or job security, combined in a vector X_i: $U_i=U_i(c_i, X_i)$. The individual disposes of monetary income y_i that is allocated across market consumption so as to maximise utility. Consider an indirect utility function that captures maximum utility obtainable given a level of income y_i, a set of prices p and non-material outcomes X_i:

$$V_i'(y_i,p,X_i)=\max_{c_i}\{U_i(c_i,X_i)|p.c_i\geq y_i\}.$$

V_i' is homogenous of degree zero in nominal incomes and prices, implying that if prices and income are multiplied by the same factor, utility remains unchanged. With a small loss of generality but for ease of exposition, we assume that *p* represents an aggregate price level of consumer goods and that there is an aggregate consumer good c. In conjunction with the homogeneity property of V_i' in income and prices, the indirect utility function can then be presented as a function of real income and non-material outcomes only:[32]

$$V'_i(y_i,p,X_i)=V'_i(y_i/p,1,X_i)=V_i(y_i/p,X_i).$$

The indirect utility function can be used to compare two situations. One is characterised by a reference set of non-material attributes X^* such as good health. The other is the individual's current situation with income y_i and non-material attributes X_i. Equivalent income y_i^* (a version of Samuelson's (1974) money-metric utility applied to a situation with non-material outcomes) is then implicitly defined as the income that makes the individual indifferent between these two situations[33] (Fleurbaey, 2009):

$$V_i(y_i^*/p,X^*)=V_i(y_i/p,X_i).$$

In practical applications, the evaluation of equivalent income is directed at capturing willingness to pay for non-material components. The willingness to pay for the improvement of non-material aspects of life will differ across individuals, depending on their preferences and levels of consumption. It is difficult to envision a mechanism that would lead to a single value for the willingness to pay across different agents.

32 . Nothing hinges on this simplification. If c is not treated as aggregate consumption but as a vector of consumer goods and p as a vector of prices, nominal income (always a scalar) would be used for normalisation: $V_i'(y_i,p,X_i)= V_i'(1,p/y_i,X_i)$ so that prices are normalised by income rather than the other way round.

33 . The Equivalent Income Approach (or its variants developed in Fleurbaey and Blanchet, 2013) has five key distinctive features compared to other methods: i) it takes into account the joint distribution of outcomes at individual level; ii) it combines several dimensions of outcomes into one synthetic measure by using individual preferences; iii) it considers "ordinal" preferences, i.e. one person prefers A to B, as opposed to "cardinal" preferences, e.g. A is preferred to B by an X amount; iv) it may consider preferences that vary across individuals in the population, for instance due to different physiological needs; and v) it may consider opportunities and freedoms to achieve some outcomes in addition to achieved outcomes, in line with the capabilities approach developed by Sen.

At the margin, one obtains an implicit valuation or shadow price of one unit of non-income outcome X_i^k against real income: $\frac{\partial V_i}{\partial X_i^k} / \frac{\partial V_i}{\partial (y_i/p)}$.

For the purpose at hand, this shadow price will be assessed based on data that reflect subjective measures of well-being (dependent variable). Ideally, the determinants of subjective well-being, used as a proxy for indirect utility, should be assessed at the individual level, while taking stock of individuals' characteristics in terms of their income and non-income situation. In practice, determinants are assessed with a panel dataset of country-level observations, as there are data constraints and statistical issues observed in regressions ran at the individual level. More concretely, average life assessment ($V_{i,t}$) within country *i* at time *t* is explained by average real household log income log $(y/p)_{i,t}$, unemployment and life expectancy as non-material dimensions:

$$V_{i,t} = \alpha_i + d_t + \beta . log\left(\frac{y}{p}\right)_{i,t} + \sum \gamma_k . X_{i,t}^k + \varepsilon_{i,t} .$$

For estimated coefficients $\hat{\alpha}$, $\hat{\beta}$ and $\widehat{\gamma_k}$ we measure the additional income that is needed to keep 'individuals' indifferent between their situation X_i and the reference situation X^* as $-w_{i,t} \equiv \left(\frac{y^*}{p} - \frac{y}{p}\right)_{i,t}$

The most favourable realisations of X in the sample were selected as reference situations[34]. Indifference between situations is captured by setting $V_{i,t}^* = V_{i,t}$:

$$V_{i,t}^* - V_{i,t} = 0 = \hat{\beta}.\left(log\left(\frac{y^*}{p}\right)_{i,t} - log\left(\frac{y}{p}\right)_{i,t} \right) + \sum \hat{\gamma}_k . (X_{i,t}^{k\,*} - X_{i,t}^k)$$

$$w_{i,t} \equiv -\left(\left(\frac{y^*}{p}\right)_{i,t} - \left(\frac{y}{p}\right)_{i,t} \right) = \left(\frac{y}{p}\right)_{i,t} \left(1 - exp\left(-\sum \frac{\hat{\gamma}_k}{\hat{\beta}} . (X_{i,t}^{k\,*} - X_{i,t}^k) \right) \right)$$

Equivalent income for group *i* is then measured as $(y^*/p)_{i,t} = (y/p)_{i,t} - w_{i,t}$. This is a monetised measure of utility. The index of standard of living for group *i* between period 1 and period 0 is given by $(y_{i,1}^*/y_{i,0}^*)/(p_1/p_0)$.

The next step towards measuring standards of living involves aggregating the equivalent incomes of different groups into a social welfare function. The aggregation problem has been at the core of social choice theory. Average income is often used as a welfare measure, but does not give priority to the worst-off. A broader class of aggregate social welfare functions has been proposed to reflect distributional concerns. Following Kolm (1966), Atkinson (1970) and Sen (1973), the social welfare function (W) can be defined as a weighted average of individual incomes or consumption, where the weights depend on society's aversion to inequality. Formally, social welfare *W* is defined as $W=W(y_1^*, \ldots y_N^*)$ and society's aversion to inequality is reflected by the choice of a particular level of identical income y_c^* that would make every member of society equally well off: $W(y_1^*, \ldots y_N^*) = y_c^*$. Atkinson (1970) defines this as the

[34] The implication is that, unlike other international comparisons such as the Eurostat-OECD Purchasing Power Parities Programme (PPP) that treats all countries symmetrically, the comparison of living standards is dependent on the choice of a situation in a particular reference country. Results change with the choice of the reference country and such dependence has been considered a disadvantage, at least in other contexts such as the PPP comparison (see Diewert [2008] for an overview). It is not apparent, however, that the same reservations apply in the case at hand. The variables selected for the measurement of living standards have a clear direction – a higher income, life expectancy or level of employment is preferable to a lower level, so selecting the country with the best outcome as the reference is a natural choice. The shadow prices used to construct equivalent income measures result from a pooled regression across time and countries and constitute an average price that does not invoke a particular reference country.

equally distributed equivalent level of income or "…the level of income per head which if equally distributed would give the same level of social welfare as the present distribution" (p. 250). He shows that the level of social welfare can be measured as:

$$W(y_1^*, y_2^*, \ldots y_N^*) = \left(\frac{1}{N}\sum_i y_i^{*1-\tau}\right)^{\frac{1}{1-\tau}}$$

The parameter τ represents aversion to inequality. When it is equal to zero, the equally distributed income simply coincides with average income as in a pure utilitarian approach. Setting a high τ is tantamount to setting equally distributed income at the income of the poorest individuals in the sample. Thus, increases in lower incomes are given relatively more weight in producing social welfare than increases in high incomes. The ratio between the equally distributed income and the mean income yields Atkinson's (1970) and Kolm's (1969) measure of inequality. If equally distributed income is close to mean income, little can be gained by redistributing income equally (low aversion to inequality). Conversely, if equally distributed income is much smaller than mean income, larger welfare gains can be reaped from a more equal distribution. Hence adopting a social welfare function allows considering various normative options on distribution by focusing on different income groups. Jorgenson (1990) and Slesnick (1998) have used this approach to construct an index of U.S. living standards, based on market consumption as the main argument in individuals' utility function. For the purpose at hand, living standards are defined more comprehensively by including non-material components but the basic approach remains the same. The social welfare function can be further written as the mean equivalent income times a penalty for inequality in equivalent income:

$$y_1^*, \ldots y_N^*) = \left(\frac{1}{N}\sum y_i^*\right)(1 - I(y_1^*, \ldots, y_N^*, \tau))\, W(y_1^*, y_2^*, \ldots y_N^*) = \left(\frac{1}{N}\sum_i y_i^*\right)\left(1 - I(y_1^*, y_2^*, \ldots y_N^*, \tau\right)$$

where $I(y_1^*, \ldots, y_N^*, \tau)$ denotes the Kolm-Atkinson inequality index. Let $\bar{y}$ be average market income and $\bar{\mu} = \frac{1}{N}\sum w_i / \bar{y}$ the average monetized flows from non-material components expressed as a share of average market income $\bar{y}$, one obtains:

$$W(y_1^*, \ldots y_N^*) = (\bar{y} + \bar{\mu}.\bar{y})\left(1 - I\left(y_1^*, \ldots, y_{N,}^*\tau\right)\right) = \bar{y}(1 + \bar{\mu})\left(1 - I\left(y_1^*, \ldots, y_{N,}^*\tau\right)\right)$$

Aggregate living standards can therefore be viewed as the sum of average (market) income, average equivalent income from non-material components, and a measure that captures inequality effects. Over time, the (log) rate of change in living standards corresponds to the rate of change of average equivalent income, decomposed into income and non-income contributions, and the rate of change of the measure of inequality:

$$\Delta lnW(y_1^*, \ldots y_N^*) = \Delta ln(\bar{y}) + \Delta ln(1 + \bar{\mu}) + \Delta ln(1 - I(y_1^*, \ldots, y_N^*, \tau)).$$

One implication of this formulation is that the present set-up allows for a substitution between average growth and inequality in the contribution to the rise in living standards. As we equate a rise in living standards for a particular segment of the population with inclusive growth, we need to assess the various combinations of changes in averages and in inequality that may arise. The segment that is considered here is the 'median' household whose equivalent income equals *W* in the current set-up. Other choices could be made for example by defining W as the equivalent income of the lower 25 income percentiles in the population. Such a choice would bring the calculation more closely in line with the 'pro-poor growth' discussion in development economics.

Our definition of inclusive growth as a rise in *W* also allows for some situations to be characterised as inclusive that are marked by rising average incomes and by rising inequality as long as the wedge between the rise in average incomes and the change in incomes of the target group is not too large.

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