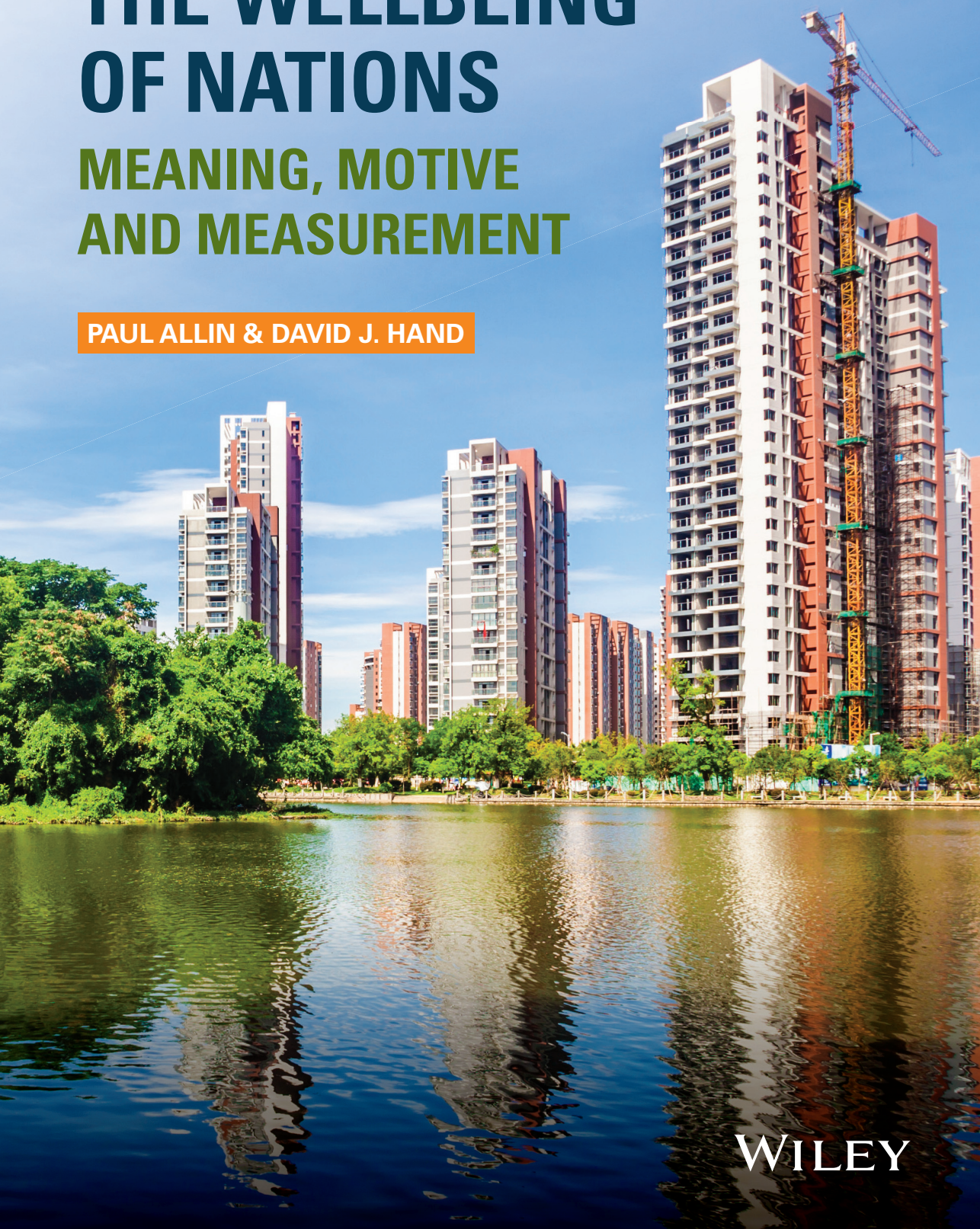
THE WELLBEING OF NATIONS

MEANING, MOTIVE AND MEASUREMENT

PAUL ALLIN & DAVID J. HAND



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Preface

In searching for a title for this book we quickly settled on 'The Wellbeing of Nations' with more than a nod to Adam Smith's great work, 'The Wealth of Nations'. Would that our book becomes as well known and as long lasting as his! We do feel we are in the same territory, especially as some initiatives to measure national wellbeing and progress talk about the 'true wealth' of nations. It seems to us that looking at stocks and capitals – not just financial wealth but also human, social and natural capital – could in the longer run provide a substantial bedrock on which to build measures of national wellbeing, sustainable development and progress.

However, our much more modest aim in writing this book is to record the considerable interest around the world in measuring wellbeing and progress in ways that go beyond purely economic measures, and the headline measure of GDP in particular. Many initiatives and new measures are being produced at local, national and international levels. Many are well established. We do detect a build up of interest and, perhaps, some convergence of established approaches such as quality of life measures, sustainable development and human development indicators. However, rather than just documenting these initiatives – an almost impossible task given the range and dynamicism of this area – we set out to reflect on all of this and, in the words of our subtitle, to consider the meaning of national wellbeing and the motive for measuring it, as well as how to measure it.

In our exploration of wider measures of wellbeing and progress, we have benefited from talking to and listening to many people including Martine Durand, Marco Mira d'Ercole (with thanks for many helpful comments on a draft) and Tim Clode at OECD; Peter Harper, Deputy Australian Statistician; Marleen De Smedt at Eurostat; Charles Seaford and colleagues in the New Economics Foundation Centre for Well-being; Jil Matheson, Glenn Everett, Stephen Hicks and colleagues in the Office for National Statistics (ONS) Measuring National Well-being Programme; Paul Anand, Paul Dolan, David Halpern, Peter Helm, Daniel Kahneman, Lord Richard Layard, Ewen McKinnon, Lord Gus O'Donnell, Andrew Oswald, Don Sellwood and all members of the ONS's Technical Advisory Group; Danny Dorling at Oxford University; Jonathan Portes and Alex Bryson of the National Institute for Economic and Social Research; Ian Bache at Sheffield University and Karen Scott, Wellbeing and Resilience Champion at the Newcastle University Institute for Social Renewal.

Our assessment of the rise of environmental awareness in Chapter 2 draws on Dieter Roelstraete's description of the birth of Land and Environmental Art (2010, p. 39). Thanks to Lewis Evans for advice on progress from a philosophical point of view; Chris Farrell for

insights into what technology and innovation do for quality of life; Chris Drew for observations on the strengths and weaknesses of the system of national accounts; Anthony S. Mann of the Committee on National Statistics for updates on US work on self-reported wellbeing; Tommaso Rondinella of Istat for updating us on 'Equitable and Sustainable Wellbeing' in Italy; Peter Goldblatt of the University College London Institute of Health Equity for keeping in touch on the Marmot Review work in this area; Jorunn Sem Fure for responding to our questions about Telemark Museums; Graham Eele and Rachael Beaven for their overview of the international statistical system, particularly with an international development focus, and for information about statistical capacity building; Neil Jackson of the UK Department for International Development for information about the expected international timetable and process for agreeing on what should replace the current set of Millennium Development Goals, when the deadline for those goals is reached in 2015; Alan Smith for opening our eyes to data visualisation and to Debbie Jupe, Richard Davies and their colleagues at Wiley for support, encouragement and advice. We thank our wives, Karen and Shelley, for looking after our wellbeing, tolerating our preoccupation with the book and helping us shape our understanding of this topic through their ideas and actions.

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Reference

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What is national wellbeing and why measure it?

> not all the calculators of the National Debt can tell me the capacity for good or evil, for love or hatred, for patriotism or discontent … at any single moment in the soul of one of these its quiet servants.
>
> Charles Dickens, *Hard Times*

This book is about social progress: its definition and its measurement. In particular, it is concerned with the overall wellbeing or quality of life of the people in a nation at a point in time, how this has changed (i.e. 'progress') and whether it is sustainable. In exploring this topic, the book seeks to address three primary questions:

What is national wellbeing?

Why should national wellbeing be measured?

How should national wellbeing be measured?

Underlying those three primary questions lie others, including:

What is individual wellbeing?

What is wrong or inadequate with existing measures of progress?

How do we *measure* national wellbeing, rather than just describe the state of the nation when we measure specific aspects of wellbeing?

How do the current and future states of the environment, including stocks of natural resources, fit into our understanding of wellbeing?

All of these questions are interwoven. For example, the definition of wellbeing and its method of measurement are two sides of the same coin, and the meaning of *national* wellbeing depends both on what is meant by *individual* wellbeing and on how one *aggregates* individual

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values to produce a national value, as well as whether there are aspects of national wellbeing which are distinct from individual wellbeing, which should somehow be included as part of the definition.

Formally, perhaps we should take the opening three questions in the order given above: start by defining the concept, then give the motivation for measuring it and then describe how to measure it. That, however, would make for rather dry reading. It would rely on the forbearance of the reader, who would have to plough through the definition before getting to the reason for reading the book and then to how it was to be done. Better, we think, to begin with the motivation, so that the pressing need for the ideas and tools described in the book serve to drive the reader on. Once the motivation has been established – once we can see the need for such an exercise – then we can dig down into precisely what it means and how we might go about it.

For this reason, we begin in the next section with the motivation: what is wrong with current approaches, current tools and current strategies for gauging the state of society and whether it is advancing or regressing. We then move on to discuss the nature and aspects of individual wellbeing and how to measure the wellbeing of individuals, before embedding this in the larger context of national wellbeing. The measurement of national wellbeing certainly involves aggregating the wellbeing of the individuals in the nation, but it also involves other aspects, such as higher level societal properties which are not evident at the level of individuals as well as other factors which may influence wellbeing and permit improved measures. As the UK Office for National Statistics report *Measuring National Well-being: Life in the UK, 2012* put it (Self *et al*., 2012, p. 3 and see Chapter 7 below): 'The well-being of the nation is influenced by a broad range of factors including economic performance, quality of life, the state of the environment, sustainability, equality as well as individual well-being.'

It may be that the individuals within a population appear to be fine, while the larger picture shows something rather different (we are reminded of the parable of the turkeys, congratulating themselves on how wonderful life is, as Christmas approaches). Conversely, and as does appear to be reflected in some of the measures, aspects of individual wellbeing may not show things in so positive a light as do some aspects of national wellbeing. For example, individual anxiety about crime may increase even while measures of actual crime rates are decreasing; likewise, increased longevity might be taken as a sign of national wellbeing, even while the ailments associated with advancing age may lead to lower individual wellbeing scores. Such discrepancies, when they occur, need to be explored and explained. (And, for the last particular example, this is one reason why Self *et al*., 2012, look at 'healthy life expectancy' rather than simply 'life expectancy'.)

Before delving into the details, however, some introductory comments are appropriate.

First, the measurement of wellbeing is a big subject. This book is very much our perspective on it: other authors will doubtlessly have different views of what is important, and will place their emphasis on different topics.

Second, and related to the first point, the book will not seek to provide an exhaustive list of relevant measures. Apart from the sheer size of such a task, it is probably impossible, simply because the area is a dynamic one, experiencing growth and change. Any list we produced would be outdated by the time this book was published. We limit ourselves to taking stock of current developments and drawing in depth on some of them.

This dynamic growth is a consequence of a third characteristic of the area: it is currently the focus of a huge amount of research attention. On the one hand, this means that governments and other actors are exploring how best to apply such ideas in policy formulation, while on

the other hand it also means that the very concepts themselves, along with how to measure them, are mutable and are still being refined and polished. Some people suspect that this refinement will take a long time, pointing out that the system of national economic accounts has been refined over decades. Waiting for the refinement to be completed (if it ever is) would appear to be out of the question.

Fourth, this book is primarily about *measuring* wellbeing. It is not about the policy implications of the results, although we do recognise that policy uses of any new measure need to be taken into account in designing and delivering it. Likewise, it is only in part about what influences wellbeing – the fact that, for example, marital status can have an effect – though inevitably there is some discussion of such matters: causes and effects may be indicators of the extent of wellbeing and thus might be used to improve measures of wellbeing, via regression or calibration models.

The history of measurement in general is one of gradual encroachment, as concept after concept succumbed to the advance of quantification. But it has been a slow and painful advance. Almost every step forward in measurement technology has faced opposition from those who thought attempts to measure or quantify some attribute were impossible or meaningless:

> Such pretensions to nicety in experiments of this nature are truly laughable! They will be telling us some day of the WEIGHT of the MOON, even to drams, scruples, and grains - nay, to the very fraction of a grain! - I wish there were infallible experiments to ascertain the quantum of brains each man possesses, and every man's integrity and candour: - This is a desideratum of science which is most of all wanted. (Harrington, 1804, p. 217)

The history of attempts to measure wellbeing can be traced back as far as one likes. Writing 130 years ago Edgeworth remarked 'hedonism may still be in the state of heat or electricity before they became exact sciences' (Edgeworth, 1881, p. 98). It is perhaps an indication of the difficulty of 'hedonimetry', as Edgeworth calls it, that it is only relatively recently that sound underpinning models and theories for measuring wellbeing have been developed.

Measuring wellbeing is also characterised by its multidisciplinary nature. Psychologists, sociologists, economists, statisticians, medical researchers, ecologists and others all have something to say about how it should be done. In part this is because they have different potential uses for such a measurement in mind, but in large part it is because the issue is fundamentally multidisciplinary. Wellbeing may be a characteristic of an individual, but it is at least partly a reflection of social interactions and is influenced by external forces.

1.1 Motivation: Why measure wellbeing?

United Nations Resolution 65/309 says:

> '*The General Assembly …*
>
> 1. *Invites* Member States to pursue the elaboration of additional measures that better capture the importance of the pursuit of happiness and well-being in development with a view to guiding their public policies;

2. *Invites* those Member States that have taken initiatives to develop new indicators, and other initiatives, to share information thereon with the Secretary-General as a contribution to the United Nations development agenda, including the Millennium Development Goals;

3. *Welcomes* the offer of Bhutan to convene, during the sixty-sixth session of the General Assembly, a panel discussion on the theme of happiness and well-being;

4. *Invites* the Secretary-General to seek the views of Member States and relevant regional and international organizations on the pursuit of happiness and well-being and to communicate such views to the General Assembly at its sixty-seventh session for further consideration'.

The UK Office for National Statistics report *Measuring National Well-being: Life in the UK, 2012* (Self *et al*., 2012, p. 3) said:

'In particular, having a more complete picture of national well-being will lead to:

- better understanding of policy impacts on well-being;
- better allocation of scarce resources via more informed policy evaluation and development;
- comparisons between how different sub-groups of the population are doing, across a range of topics;
- more informed decisions on where to live, which career to choose, based on well-being information for that area/organisation;
- assessments of the performance of government;
- comparisons between the UK with other countries'.

Implicit in these two extracts is the fact that a (perhaps the) key role of a government is to ensure the wellbeing of those it governs. That in itself probably provides sufficient answer to the question posed in this section's heading.

Only if one can measure wellbeing can one tell if the government is succeeding and, even more, if progress is being made. Furthermore, government policies ought, above all, to be evidence based, and usually that evidence will be quantitative, so that *measures* of wellbeing are critical. Such measures, when developed for groups, at more than the individual level, will allow one to monitor change (are things getting better or worse?), to compare groups (do the sexes have different degrees of wellbeing? Do different ethnic or social groups progress differentially?) and generally to investigate the impact of policies (have changes to education systems enhanced overall quality of life?). There are then other general questions which require answers. For example, what explains the frequently observed U-shaped distribution of wellbeing (with greater wellbeing being observed in younger and older age groups)? What explains the weakness of the correlation between income and wellbeing over time? Why in many countries are aggregate levels of happiness much the same as they were at the end of the Second World War, despite the dramatic growth in income per capita since then? And so on.

From the time of the Second World War to the present, economic measures, typically in the form of national economic accounts, have taken the primary place in monitoring progress. Measures such as gross domestic product (GDP) and gross national product (GNP) are headline indicators. But economic indicators focus on just one aspect of life. They do not touch on health, for example (other than through the cost of health service provision). There is concern in some quarters that standard measures of economic performance and progress are not really suited to the policy decisions which they are being used to inform. In 2009, the economists Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi, wrote in the preface of their report on measuring societal wellbeing, commissioned by Nicholas Sarkozy, the then French President:

> We see the world through lenses not only shaped by our ideologies and ideas but also shaped by the statistics we use to measure what is going on, the latter being frequently linked to the former. GDP per capita is the commonly used metric: governments are pleased when they can report that GDP per capita has arisen [sic], say, by 5%. But other numbers can tell a very different picture. In Russia, declining life expectancy suggests there are underlying problems, even if GDP per capita is rising. So, too, in the United States, most individuals saw a decline in income, adjusted for inflation, from 1999 through 2008 - even though GDP per capita was going up - providing a markedly different picture of performance. Such a disparity may arise when income inequality increases at the same time that income increases. (Stiglitz *et al*., 2010, p. xix).

There are other similar examples: Egypt showed a per capita GDP increase from $4760 to $6370 between 2005 and 2010, and yet the proportion of survey respondents classified as 'thriving' declined from 29% to 12% (OECD, 2013, p. 27).

An example of the disconnect between crude economic indicators such as GDP and more general measures of wellbeing is given in the United Kingdom by current intensive debate about whether a third runway should be built at Heathrow. From a narrow economic perspective the answer is clearly yes. The United Kingdom is suffering, relative to other European countries, from its limited capacity for long-haul flights to other parts of the world, especially the Far East. But from the perspective of the wellbeing of people in West London and surrounding villages living under the flight paths of 1300 wide-bodied jets taking off and landing every day, economic measures only scrape the surface of what is meant by wellbeing. Likewise, they fail to tap into the environmental impacts of increased air travel.

So GDP misses central aspects of what people regard as important. GDP was not designed to be an overall measure of wellbeing, so it is not surprising that it is now judged inadequate in that respect. More generally, as we shall see, perhaps *economic* measures themselves are inadequate or insufficient. After all, contentment, happiness, quality of life etc. are influenced by more than mere financial wealth or income. The richest person, suffering constant pain from an incurable disease, may well not rate their wellbeing as very high. Likewise, exhaustion of natural resources may lead to a short-term benefit, but it will mean the consequent enhanced quality of life will not be sustainable.

Furthermore, some things which increase economic activity, and hence GDP, are best regarded as decreasing wellbeing. A famous comment made by Robert Kennedy (which we will quote in Chapter 2) illustrates this, referring to such things as jails, napalm and nuclear

warheads as contributing to GNP but hardly enhancing national wellbeing. Sitting in traffic jams consumes fuel and hence adds to GDP, but is hardly beneficial to society.

Another reason for the divorce of measures such as GDP from the wellbeing of any one person is that the former are necessarily *aggregate* measures. Any measure at the national scale must be an aggregate measure, but it is not, a priori, clear that the same concepts or ideas should apply at the national level as at the individual level. To take a trivial analogy: we can talk about the variance or the skewness of a set of values (as, e.g. wealth distributions are typically skewed, with long right tails), but we cannot talk about the variance or skewness of individual values. This example, of skew wealth distributions, is particularly relevant to wellbeing, as there is evidence that *inequalities* in the distribution of resources across a population have a negative impact on perceived wellbeing. Compelling evidence for this is adduced by Richard Wilkinson and Kate Pickett in their book *The Spirit Level* (Wilkinson and Pickett, 2010). As Stiglitz *et al.* (2010, p. xi) remark: 'One of the reasons that most people may perceive themselves as being worse off even though average GDP is increasing is *because they are indeed worse off*' (their italics). In general, it is entirely possible for the majority of people to experience a decrease in some variable while the average still increases.

In fact, even in the context of straightforward economic indicators, GDP has peculiarities as a measure of a country's 'economic wellbeing'. It excludes revenue earned from overseas production but paid to a country's residents, and it includes income paid to non-residents. It also ignores internal household work, such as childcare, and, at a more fundamental level, a level which is increasingly being recognised as of fundamental importance, GDP takes no account of sustainability: are finite natural resources being consumed, so that current 'economic progress' is being achieved at the cost of a future loss?

Most important of all, however, is the straightforward limited scope of GDP, in that it focuses on economic measures and fails to tap aspects which are regarded just as central to wellbeing, such as security, health, social networks, freedom to pursue what interests one, leisure time and so on.

Crime will decrease wellbeing overall in society. This is apparent even in such measures as GDP, where fraud has a negative impact. For example, the collapse of the Kabul Bank in Afghanistan as a result of fraud cost the country 5% of its GDP (BBC, 2012). But keeping such gross examples aside, GDP completely fails to tap into other aspects of crime which arguably have a much more direct adverse effect on individual wellbeing. So-called 'quality-of-life' crimes, including low-level things such as broken windows, littering and vandalism have a tiny economic impact but a large wellbeing impact. As we stress throughout the book, different aspects of wellbeing are interlinked in a complex way, so that minor quality-of-life crimes may have a larger impact through the subliminal messages they send about the extent to which people (including the authorities) care.

Chapter 6 discusses the shortcomings of GDP in more detail, but the fact is that GDP was never intended to be used as a global indicator of *wellbeing*. Its dominant role as an indicator of economic progress gives a very one-sided view of a multifaceted concept. This is a point to which we will repeatedly return, especially when we consider whether it is in fact possible to measure wellbeing by a single index, or whether something more is needed – a 'dashboard' of indicators, perhaps.

Having said all the above, GDP does have some attractive properties. We should learn from this when we try to develop more appropriate measures of wellbeing. For example, GDP adopts a monetary numéraire, translating *everything* into financial units. This means one can

balance different attributes against each other. We shall say more about this when we discuss *conjoint measurement* in Section 1.7.

The report by Stiglitz *et al*. (Stiglitz *et al*., 2010) makes five recommendations relating to GDP to improve its relevance as a measure of living standards.

Recommendation 1: When evaluating material wellbeing, look at income and consumption rather than production.

Recommendation 2: Emphasise the household perspective.

Recommendation 3: Consider income and consumption jointly with wealth.

Recommendation 4: Give more prominence to the distribution of income, consumption and wealth.

Recommendation 5: Broaden income measures to non-market activities.

These recommendations will be discussed in detail in Chapter 6, but here we merely remark that recommendations 1 and 3, and to a certain extent 4, might be regarded as a manifestation of the Micawber philosophy (Dickens, 1850): 'Annual income twenty pounds, annual expenditure nineteen pounds and six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery'. (This refers to Great Britain's pre-decimalisation currency, in which there were 240 pence in a pound.) Recommendation 2 is concerned with the distinction between the (almost) individual level rather than the aggregate national level and recommendation 5, with the fact that economic measures are not everything. With the exception of 5, these recommendations still refer only to economic performance. Wellbeing goes beyond that.

The Stiglitz report goes on to cover aspects beyond the economic, making a further seven recommendations.

Recommendation 6: Quality of life depends on people's objective conditions and capabilities. Steps should be taken to improve measures of people's health, education, personal activities and environmental conditions. In particular, substantial effort should be devoted to developing and implementing robust, reliable measures of social connections, political voice, and insecurity that can be shown to predict life satisfaction.

Recommendation 7: Quality-of-life indicators in all the dimensions covered should assess inequalities in a comprehensive way.

Recommendation 8: Surveys should be designed to assess the links between various quality-of-life domains for each person, and this information should be used when designing policies in various fields.

Recommendation 9: Statistical offices should provide the information needed to aggregate across quality-of-life dimensions, allowing the construction of different indexes.

Recommendation 10: Measures of both objective and subjective well-being provide key information about people's quality of life. Statistical offices should incorporate questions to capture people's life evaluations, hedonic experiences and priorities in their own survey.

Recommendation 11: Sustainability assessment requires a well-identified dashboard of indicators. The distinctive feature of the components of this dashboard should be that they are interpretable as variations of some underlying 'stocks'. A monetary index of

sustainability has its place in such a dashboard but, under the current state of the art, it should remain essentially focused on economic aspects of sustainability.

Recommendation 12: The environmental aspects of sustainability deserve a separate followup based on a well-chosen set of physical indicators. In particular there is a need for a clear indicator of our proximity to dangerous levels of environmental damage (such as associated with climate change or the depletion of fishing stocks.)

Recommendation 6 needs to be read in conjunction with a list of seven aspects of life presented by Stiglitz *et al.* as the key dimensions to be taken into account, ideally simultaneously, in measuring quality of life. Six of the seven dimensions are actually mentioned in the recommendation: they all need improved measures. One of these, the environment, is linked to sustainability, the subject of Recommendations 11 and 12, because it is meant to address future conditions as well as the present condition of the environment. The other dimension of quality of life, material living standards, covers income, consumption and wealth, which are also the subjects of Recommendations 1–5. So, while there is no precise definition of wellbeing here, the recommendations do cover economic performance, quality of life, the environment and sustainability. We will discuss the recommendations in detail in Chapters 4 and 6.

Finally, as a last illustration, the Belgian Federal Planning Bureau (2005) describes three areas of capital that can be used and developed.

1. *Human capital: comprising the standard of living (material well-being), health (both mental and physical) and knowledge/capacities (what individuals know and are able to do).*

2. *Environmental capital: including both natural resources (water, air, land and mineral resources) and the biosphere with all its biological diversity.*

3. *Economic capital: subdivided in physical and technological capital (equipments, buildings, infrastructure, and intangible assets including software and technology patents) and net financial assets.*

Only one of these three is primarily about economics.

1.2 What is individual wellbeing?

Wellbeing has been the subject of a very considerable amount of research, stretching back decades, especially within the psychological and medical communities, and has been defined in various ways. For example:

> Wellbeing … comprises objective descriptors and subjective evaluations of physical, material, social and emotional wellbeing, together with the extent of personal development and purposeful activity, all weighted by a set of values. (Felce and Perry, 1995)

> Well-being is a complex construct that concerns optimal experience and functioning (Ryan and Deci, 2001).

> Well-being can be understood as how people *feel* and how they *function*, both on a personal and a social level, and how they *evaluate* their lives as a whole (Michaelson *et al.*, 2012).

Other, closely related terms are also used, including such things as an individual's 'quality of life' and 'life satisfaction'. Indeed, Easterlin (2003) opens his discussion paper on 'building a better theory of well-being' by saying 'I take the terms wellbeing, utility, happiness, life satisfaction and welfare to be interchangeable'.

Fayers and Machin (2000, p. 3) comment:

> It is clear that QoL [Quality of Life] means different things to different people, and takes on different meanings according to the area of application. To a town planner, for example, it might represent access to green space and other facilities. In the context of clinical trials we are rarely interested in QoL in such a broad sense, but are concerned only with evaluating those aspects that are affected by disease or treatment for disease. This may sometimes be extended to include indirect consequences of disease such as unemployment or financial difficulties.

The word 'happiness' also often crops up. It appears, for example, in the extract from the UN General Assembly resolution quoted at the start of Section 1.1 – though note that it is invariably in the context of the phrase 'happiness and well-being' rather than in isolation. This suggests that happiness is different from wellbeing. However, any differences are often lost in popular media accounts, which frequently characterise the measurement of wellbeing as the measurement of happiness. The New Economics Foundation report, *Measuring Well-being: A Guide for Practitioners* (Michaelson *et al.*, 2012, p. 6), has this to say about happiness (based on a well-established understanding of wellbeing in psychological terms):

> It is worth pointing out that well-being is not exactly the same as happiness. **Happiness** often refers to how people are feeling moment-to-moment and does not always tell us about how they evaluate their lives *as a whole* (although it can do), or about how they *function* in the world. **Well-being is a much broader concept** than moment-to-moment happiness: it includes happiness but also other things such as *how satisfied people are with their lives as a whole*, and things such as *autonomy* (having a sense of control over your life), *purpose* (having a sense of purpose in life).

Wellbeing and quality of life are different from 'standard of living', which is taken to refer primarily to economic aspects – income, wealth and general material conditions such as quality of accommodation, access to health care and so on. It is clear from this that quality of life and wellbeing are broader concepts, since they also cover such things as social life, the environment and cultural activities and also subjective happiness.

Things are then further complicated by the existence of specialised variants, such as Activities of Daily Living scales, Health Related Quality of Life (HRQoL) and others. Activity of Daily Living scales measure the extent to which people can perform personal activities and normal self-care functions. They cover such things as dressing, bathing and personal hygiene, feeding oneself, organising things at home and so on. One might argue that a high state of wellbeing would be reflected by a high score in such areas. HQoL scales often

cover similar things, though they may be relative to what the patient might expect, given their condition. That last point leads to a potential complication in wellbeing measures in general: the response to a question such as 'overall, how satisfied are you with your life?' might well be qualified (perhaps not explicitly) by 'under the circumstances (of your condition) . . . '.

None of the above should be surprising. Wellbeing is an intrinsically complex and multi-dimensional concept, with different parties naturally having interests in different aspects, so to expect a single universally agreed definition would be to expect too much. But it can lead to problems. Fayers and Machin (Fayers and Machin, 2000, pp. 3–4) say that 'In the absence of any agreed formal definition of quality of life, most investigators circumvent the issues by describing what *they* mean by quality of life and then letting the items (questions) in their questionnaire speak for themselves'. As we discuss in Section 1.4 and Chapter 4, defining the concept in terms of its measurement procedure is fine. What is less fine, however, is producing a superficial definition which fails to meet the basic criteria of a measurement or indicator. These issues are discussed in Section 1.5. More generally, if one does have multiple descriptors, each addressing some aspect of wellbeing, then in some circumstances one can sidestep summarising them into a single number, instead of reporting a profile: painting a picture rather than a single score.

Wellbeing, especially in the psychological sense of flourishing, is in some sense the opposite of clinical conditions such as depression. There has been a huge amount of work on measuring depression – see, for example, Dunn *et al.*, 1993; Santor *et al.*, 2006. The latter notes that 'since 1918, more than 280 measures of depressive severity have been developed and published'. It is perhaps interesting that relatively little of the work on wellbeing makes explicit reference to the work on depression, despite the complementary relationship between the two. For example, Table 1 of Santor *et al.*, 2006, lists symptom domains covered by various depression scales. This list includes sleep, irritability, anxiety, hopelessness, suicidal tendency, concentration, energy/fatigue, worthlessness, agitation, withdrawal, no interest in others and so on, all of which researchers in wellbeing will recognise. More generally, Kahneman *et al.* (2003, preface) note that, in the context of hedonic psychology – the psychology of 'pleasurable and unpleasurable states of consciousness' – 'another characteristic of past research is the remarkable accentuation of the negative. Textbooks that do not mention pleasure or well-being at all devote many pages to the clinical phenomena of anxiety and depression'.

A high level informal definition of wellbeing might be that it is 'what matters to people', and indeed the phrase 'What matters to you?' was adopted as the strapline for the study on wellbeing policy in the United Kingdom and the measuring national wellbeing programme of the UK Office for National Statistics (see Chapter 7). This informal definition drives home the fact that wellbeing is something to be hoped for, aspired to and aimed at.

Section 1.5 discusses the basic principles of measurement. We shall see that measurement procedures have two aspects – sometimes termed their *representational* and *pragmatic* aspects. Representational aspects are those concerned with preserving the relationships between the objects under study, when mapping from the system being measured to a numerical representation. Pragmatic aspects are those concerned with deciding what characteristics are relevant, and how they should be captured within the measurement index (the 'items' in the terminology of Fayers and Machin, though pragmatic aspects go much further than the mere choice of questions in a questionnaire).

Wellbeing measures typically have a large pragmatic component, and so to a large extent their definition and measurement procedure are one and the same; the specification of the

way wellbeing is measured is also a definition of what is meant by wellbeing. The large pragmatic component inevitably means that not everyone will agree on a definition – perhaps because they have different intended uses for the indicator in mind or because they have different philosophical bases for what they mean by measurement. For example, even if you and I agree that having a supportive social network and being healthy are key contributors to wellbeing, we might disagree on the relative weight to be assigned to them in our overall index.

In summary, in general we should expect there to be multiple measures of wellbeing: different measures, that is, different *definitions* of wellbeing, will be suitable for different purposes – just as different measures of inflation are appropriate according to whether one is seeking a macroeconomic indicator or a cost of living indicator.

1.3 Aspects of individual wellbeing

We have stressed that individual wellbeing has multiple aspects. The potential constituents of individual wellbeing can be classified in various ways. In this section we shall look at some useful distinctions. We shall discuss how the constituents might be combined to yield an overall measure in the next section.

McAllister (2005) classified constituents into five types. 'Most researchers agree about the domains that make up wellbeing: physical wellbeing; material wellbeing; social wellbeing; development and activity; emotional wellbeing. The elements can be paraphrased as physical health, income and wealth, relationships, meaningful work and leisure, personal stability and (lack of) depression. Mental health is increasingly seen as fundamental to overall health and wellbeing. These elements are sometimes viewed as "drivers" of wellbeing.'

In contrast, the Organisation for Economic Co-operation and Development (OECD) study *How's Life: Measuring Well-Being* (OECD, 2011a) and the OECD *Compendium of Well-being Indicators* (OECD, 2011b) identified two pillars of wellbeing. The first was *material living conditions*, covering such things as income and wealth, jobs and earnings and housing. The second was *quality of life*, covering such things as health, work/life balance, education, civic engagement, social connections, environmental quality, personal security and subjective wellbeing. Then, in addition to these two, they added *sustainability*, necessary if current levels of wellbeing are to be maintained over time. Data availability and other issues meant this last one was not discussed in detail in the *How's Life* report, although in other work the OECD does report on sustainable development and green growth indicators and how these might be used within the broader picture of national wellbeing (e.g. Strange and Bayley, 2008). It is this broader picture of national wellbeing in which we are particularly interested, seeing future and current wellbeing as integral to 'how a country is doing'.

We see immediately from this that the OECD definition does not treat quality of life as synonymous with wellbeing, but rather as a subcomponent of it. Since subjective wellbeing is regarded as a component of quality of life, at first glance it might look as if a rather circular definition results, but in fact overall wellbeing includes other, objective aspects, noted above.

A less high-level classification of the constituents of wellbeing, focussing more on the quality of life aspects, is into cognitive and affective components, with the affective component being further partitioned into positive and negative aspects. This is a quite common distinction. Thus, for example, the *Commission on the Measurement of Economic Performance and Social Progress* (see Stiglitz *et al.*, 2010) asserted that 'subjective well-being (encompasses)

three different aspects: cognitive evaluations of one's life, positive emotions (joy, pride) and negative ones (pain, anger, worry)'. Particular, measures, (e.g. the Positive and Negative Affect Schedule, Watson *et al.*, 1988) focus on specific aspects.

And digging down yet further, the New Economics Foundation guide to measuring well-being (Michaelson *et al.*, 2012), focuses very much on subjective wellbeing, and identifies three aspects for practitioners to consider:

– how people feel, covering emotions such as happiness and anxiety;
– how people function, covering such things as 'sense of competence' and 'sense of being connected to those around them';
– how people evaluate their lives, covering such things as satisfaction with life, and comparison with the best possible life.

We can see from the above that how wellbeing is defined – and hence how it is measured – depends very much on the level at which it is approached. A high-level perspective will include things such as the freedom to express political opinion. A low-level perspective might focus very much on subjective wellbeing. There also is a clear link to the notions of exogenous and endogenous variables in economics, with the former being external things which influence wellbeing, and the latter internal aspects of wellbeing. In the next section we draw a related distinction between 'influences on' and 'consequences of' when constructing measures of wellbeing. This is a distinction which has not been widely recognised, but could have an important impact on the quality of the measurement system which results. Traditionally, in wellbeing measurement, all related variables have been treated in the same way.

An important distinction underlying notions of wellbeing is that between *hedonic* and *eudemonic* wellbeing. Rather than being alternatives, however, they might properly be regarded as complementary aspects of a larger whole.

The hedonic perspective might be seen as the 'naive' perspective, and is certainly the viewpoint that popular media often take. This perspective regards wellbeing as a degree of happiness. In contrast, the eudemonic perspective might be characterised as regarding wellbeing as a fulfilled potential and meaning in one's life.

Notions of hedonic wellbeing can be traced back to the ancient Greeks, in a balance of pleasure against displeasure. Utilitarianists such as John Stuart Mill and Jeremy Bentham held that the proper aim of actions should be to maximise 'utility', defined in terms of positive happiness and negative suffering. For example, Bentham's *An Introduction to the Principles of Morals and Legislation* begins

> Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. It is for them alone to point out what we ought to do . . . By the principle of utility is meant that principle which approves or disapproves of every action whatsoever according to the tendency it appears to have to augment or diminish the happiness of the party whose interest is in question: or, what is the same thing in other words to promote or to oppose that happiness. I say of every action whatsoever, and therefore not only of every action of a private individual, but of every measure of government. (Bentham, 2009)

Nobel Laureate Daniel Kahneman and his co-editors, in their book *Well-being: The Foundations of Hedonic Psychology*, defined 'the new field of hedonic psychology' as being about

'what makes experiences and life pleasant and unpleasant' (Kahneman *et al.*, 2003). The perspective is very much a subjective one.

Like hedonic wellbeing, notions of eudemonic wellbeing can be traced back at least as far as the ancient Greeks, with, for example, Aristotle characterising simple (hedonic) happiness as suitable only for beasts. In contrast, eudemonic wellbeing arises when one's life is most in accordance with one's beliefs and attitudes, when there is personal development and a sense of achievement or fulfilment. Descriptions such as 'positive functioning', 'fully functioning', 'personal growth', 'meaningfulness', 'acting with integrity' and so on are often associated with eudemonic happiness.

As we mentioned in Section 1.1, a key motivation underlying the recent interest and work on measuring wellbeing is the intention to use such measures as indicators of the effectiveness of public policies. This will only be possible if wellbeing can be influenced and changed by such policies. That raises a number of issues.

The obvious one is whether wellbeing is a psychological trait or state. A trait is fairly constant over time, whereas a state is something which depends on circumstances and experiences. Happiness, for example, will probably usually be regarded as a state. If wellbeing is a trait, then, while measuring it might be of scientific interest, it would be of limited value for policy decisions. In contrast, if wellbeing is a state that could be influenced by external events and experiences, then it clearly does have policy implications. The distinction is tied to the notion of homeostasis.

A homeostatic system is one which, when perturbed by shocks, tends to revert to its original condition – an equilibrium state, one might say. If a state of wellbeing (whether low or high wellbeing) is such a homeostatic equilibrium, then measurements of it would not be expected to change much over time (at least not in the aggregate), so that again wellbeing would be of purely scientific interest, rather than policy interest. Indeed, a classic study of lottery winners and accident victims suggested that this homeostatic notion might be true, with the happiness of both groups later returning to their pre-incident levels (although this result has recently been criticised by Helliwell, CSLS, 2011). This phenomenon has also been termed *the hedonic treadmill* (Brickman and Campbell, 1971).

We must also ask ourselves whether different people are likely to have different basic degrees of wellbeing. For example, it does not seem unreasonable to suppose that someone predisposed to depression will have a lower degree of wellbeing than others. In a meta-analysis, DeNeve and Cooper (1998) found that subjective wellbeing and various personality traits were correlated, with (perhaps unsurprisingly) extraversion and agreeableness being positively correlated and neuroticism negatively correlated.

Then, even if measured wellbeing does (or can) change over time, we need to be sure we can identify the cause of the change, and determine that it is not merely due to measurement characteristics or other kinds of change. The Flynn effect illustrates the dangers. This is the phenomenon, discovered by James R. Flynn, that IQ scores have increased from generation to generation over the past century (Flynn, 2012). One explanation is that successive generations are becoming more intelligent, and not in a minor way – the changes have been described as massive and for some populations are much larger than one standard deviation of the IQ distribution. But this seems unlikely on other grounds – the evidence of history shows that our great grandparents were not idiots. A far more convincing explanation is that people are becoming more skilled at the kinds of abstract reasoning which IQ tests typically measure. Any observed changes in measured wellbeing would not be attributable to the same cause (increased skill in abstract reasoning), but we need

to be confident that they do not have some cause other than the policy change we may be investigating.

This sort of phenomenon is related to issues of cultural difference. Apart from measuring the impact of public policies, one of the ways that wellbeing measures will be used is to compare groups. Nationally, these will be social, ethnic, gender, age and other groups within a country, but the measures will also be used internationally to compare nations. The difficulty is, as countless cross-cultural comparisons have found in the past, that such comparative statements are fraught with problems. At the very simplest level, translations of questionnaires can change the meaning, and we know, even at the most basic of levels, that question wording can have a huge impact on responses. Moreover, as Christopher (1999) has pointed out, definitions of wellbeing are necessarily culture dependent. The problem of identifying equivalent constructs across different cultures may well defy effective solutions.

Another way of classifying aspects of wellbeing is into 'objective' and 'subjective' aspects. An objective aspect will be something external to the individual but which is thought to have an impact on their wellbeing or be indicative of their state of wellbeing. A subjective aspect will be (for example) a simple self-reported state of someone's wellbeing. Note, however, that it is not the self-reporting which makes the indicator subjective, but rather the fact that it is reporting on an internal (subjective) aspect of their condition.

Yet another classification is into those which represent some kind of predictability, choice or control and those which do not. For example, if one feels one has made one's own choice about education, daily personal activities, use of leisure time, political voice and so on, then one is likely to feel more at ease with oneself than if one feels these choices were imposed upon one. Being told what to do all the time is not conducive to psychological wellbeing. The notion that one is able to control and influence things, rather than being subject to the whims of fate, is something which will recur in our consideration of wellbeing. The feeling of being unable to control things may be one reason why unemployment is generally associated with poor wellbeing beyond the extent to be expected as a consequence of loss of income.

Likewise, one can distinguish between aspects which represent security and those which do not. For example, feelings about health, crime, a safe place to live, good nutrition, strong social networks and so on will all impact the degree of wellbeing.

Various objective measures have been identified as central to wellbeing. They include the following.

– *Education*: An educated workforce is necessary for a modern technological society, and so education and economic progress are related. But more than this, we have already mentioned the importance of choice and control, and education gives people greater choice and control. Education breeds opportunity. A higher level of education is also associated with better health, lower unemployment and greater social engagement, though clearly the causal links may not be straightforward. On the other hand, there are subtleties. For example, there is the complication that perhaps education can promote inequality. It might lead to a greater dispersion in income over a population. Such things are discussed below, in the light of evidence that societies which have higher degrees of inequality may have lower aggregate measures of wellbeing (Verme, 2011). This illustrates the importance of measuring the shapes of distributions, not merely their means or medians. Alternatively, increased education might lead to increased dissatisfaction if appropriate jobs are not available.

Human capital measurement, as quoted from the Belgian Federal Planning Bureau document at the end of Section 1.2, invariably focuses on the labour market benefits of education and training. This has the result that someone unemployed or retired has no human capital. Of course, there is a wider concept of human capital, defined in terms of contributions to society and to one's own fulfilment and wellbeing.

– *Personal activities*: Again, having the freedom to pursue one's own interests represents an aspect of choice and control, and so is likely to promote wellbeing.
– *Political voice and governance*: Stiglitz *et al.* (2010, p. 78) stress 'political voice [as] an integral dimension of the quality of life'. Once again, this is closely related to notions of control, rather than being subject to the (potentially arbitrary and unpredictable) whims of someone else. It permits individuals to feel they have a say, at a fundamental level, in how their lives proceed. This opens up important cross-cultural and cross-national issues: if political voice is to be included as a contributory factor in a wellbeing measure, how should countries with different political structures be compared? These ideas are also closely related to trust in public institutions, showing why responsible and accountable regulatory authorities are so important.
– *Security*: This is almost too obvious to need mentioning, but a feeling of safety – from crime, war, accidents, economic crises and so on – is conducive to higher degrees of wellbeing. Security is, of course, also related to health – the feeling that one is safe from disease or illness. As far as crime is concerned, we must distinguish between the actual level of crime and the perceived level of crime. For example, 'when people have a perception of crime as a problem in an area, the experience of crime or worrying about crime does not offer much additional purchase in understanding their quality of life' (Christmann and Rogerson, 2004). Indeed, anxiety about crime can go up while true crime rates go down. Economic security and the anxieties which can arise from it, are particularly pertinent at present, in the straitened economic conditions consequent on the banking crisis. This includes things like financial insecurity, employment insecurity (unemployment, as we have noted, impacts wellbeing to an extent beyond the obvious financial hit), as well as long-term insecurity as people fear what may await them in retirement.
– *Social networks*: Strong social support networks induce benefits at several levels. At the basic level, there is a correlation between strength of social network and quality of life, and there is considerable evidence that social support is associated with better health and wellbeing in general. Of course, there may be issues of causal direction. At a higher level, clearly a larger social support network means that one is more likely to be in employment, and possibly have a higher level of education. The positive impact of being married (at least, for men) is one aspect of this and, in general having an intimate partner confers some protection from the potentially detrimental consequences of adverse life events. All these things are correlated.
– *Environmental conditions*: Immediate environmental conditions have an impact on our everyday quality of life. The contrast between living next to a busy motorway and a tinkling stream illustrates this. But there is also a larger impact on health through pollution or on cost of living due to droughts impacting food prices, for example. Moreover, unsustainable costs or resource consumption incur a debt to the future. It means that future quality of life will be proportionately lower. This is why more recent thinking includes sustainability having an impact on wellbeing. One can see particular

difficulties here, because of the timescales involved, and the need to determine likely impacts in the future.

- *Material living standards*: This is the aspect which has received most attention in the past, so perhaps it is unnecessary to say much about it here. We will return to it below.
- *Health*: In Chapter 2 we quote the World Health Organisation definition of health, as contained in its constitution: 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. Again we have something of the circular in the definitions: Measures of wellbeing often include health as an aspect, but the WHO definition of health includes wellbeing. Despite this, health clearly has a central impact on wellbeing.

We have already mentioned that all these various aspects are correlated. Blunt description fails to capture the subtle causal relationships, and indeed to tease these out would be a vast project. But it also fails to identify the fact that there are probably synergistic relationships. Being both unemployed and ill is likely to have a greater impact than the mere 'sum' of the parts. At the least this means that one cannot simply combine the results of instruments measuring the distinct aspects of wellbeing, but have to look at things from a holistic perspective: both the measures and their interactions need to be studied.

1.4 How to measure individual wellbeing?

1.4.1 Basics of measurement

In a detailed discussion of the foundations of measurement, Hand (2004, p. 23) pointed out that we view the world through the spectacles of measurement. Modern technology, modern civilisation, is built on quantitative characterisation of the objects and attributes about us. It is such quantitative characterisations which ensure that our bridges do not fall down, our food distribution networks function, transport systems get us to work and our television, telephone and other communications systems do what they were intended to. It is such quantitative characterisation which enables us to measure how well we are doing, and to set targets and assess our achievements against them. But such quantitative characterisations have not always come easily.

We noted in Section 1.2 that all measurement can be thought of as a mix of two aspects, the representational and the pragmatic. Representational measurement is concerned with the mapping from the system of objects and the relationships between them to a corresponding numerical representation. A simple example would be placing two rocks on the two pans of a weighing scale and assigning a larger number to the rock which forced its pan down. By this means we could assign a set of numbers to the rocks which represented their weight, in the sense that larger numbers were associated with heavier rocks. Then, going further, we could place two rocks together on one pan, and find a third rock which just balanced this pair of rocks. It is then possible to assign numbers to the rocks such that the sum of the two numbers assigned to the pair on the same pan equalled the number assigned to the other rock. These numbers have the properties of our usual measure of weight. Indeed, we could take a particular rock and let the number assigned to it be unity, and then all the other rocks would have weight defined in terms of it. In standard usage, such a procedure determines the unit of measurement, with 'unity' corresponding to 1 oz or 1 kg and so on.

Representational measurement, as illustrated by our rocks example, is all very well, but clearly something more is needed when we attempt to measure wellbeing. This 'something else' is the pragmatic aspect of measurement. The representational aspect of measurement constrains the numbers we can use to represent the magnitudes of attributes of objects by requiring the relationships between these numbers to be the same as the relationships between the objects (e.g. the number assigned to represent the weight of one rock is greater than that assigned to represent the weight of another if the first rock 'is heavier than' than the second, i.e. the first rock tips the scale). The pragmatic aspect of measurement also places constraints on the numbers we can use, but these constraints are chosen for reasons of convenience, practicality or to encapsulate our intended meaning of the attribute in question. In measuring wellbeing, for example, as the preceding sections will have made abundantly clear, different researchers regard different properties as being part of the overall concept of wellbeing. To assign a number to the wellbeing of an individual, we first have to decide which of these properties we regard as relevant, and then we have to decide how to combine these properties. As Hand (2004, p. 13) puts it: '[Pragmatic constraints] *crystallize* the numerical assignment, so that we know exactly what we are talking about.'

There are a number of consequences of this. Different researchers may well have different views on what is relevant or important. The various sets of relevant characteristics listed in the previous section illustrate some different perspectives. It is reassuring, however, that the various sets have much in common. The main difference appears to be the scope of the lists.

Different researchers will also have different views on how to combine the various characteristics which are parts of wellbeing. Should one use a weighted sum – a sum of the values of the characteristics, with each one weighted according to its perceived importance? If so, what weights are appropriate? Is some more elaborate combination method appropriate? Since different choices can be made, different researchers will have different definitions, as well as different ways of measuring wellbeing. This is fine: unlike 'weight', 'wellbeing' is a complex concept, and we should expect different definitions, meanings and measurement procedures to emerge as we dig down into exactly what we mean by it and as we tap into and emphasise different aspects of it. But we should not lose sight of the concomitant obligation that when one talks of wellbeing one must be explicit about precisely what definition one is using.

Domains such as wellbeing, which have a very substantial pragmatic component, present tougher measurement challenges than largely representational domains, such as weight. But the differences are perhaps not so great as some believe. As Quetelet put it in the mid-nineteenth century: 'Although we are here in a new field, where facts cannot be estimated mechanically, as in the physical sciences, the difference, nevertheless, is not to be held so great as it may appear at first sight. Even the physical sciences sometimes rest on facts which are not identically the same, as deaths and births should be, and which may lead to appreciations and conclusions more or less great. With the use even of an instrument, when one wishes to discover a temperature, a magnetic declination or the force and direction of a wind, does one really find the quantities which are sought? When one measures an individual, is the real height positively discovered? Errors, greater or lesser, may be committed, and observation alone can recognise the limits within which they range. Has the consideration of the average life of man been rejected, because that average rests upon numbers which vary, without doubt, within limits as extended as can be conceived?' (Quetelet, 1842, p. ix).

And, one might add, measurement error aside, individual heights are not well defined: they change over the course of a day, under the inexorable force of gravity squashing the cartilages and organs of the human body.

In all measurement, whether representational or pragmatic, one must be sure one is measuring the right thing. Now, 'right', out of context, is meaningless. This means that, before we can decide how to measure an attribute, we need to decide what is the purpose of our measurement. And then we need to match our measurement procedure to that purpose. Someone on a slimming diet basing their success on their height or the length of their hair would not make much progress.

Measurement procedures which are heavily pragmatic are typically found in very complex areas, and usually the social or behavioural sciences, but not solely: Baggott (2004, p. 320) gives an example from quantum mechanics. He says 'Remember that we have no way of knowing the "actual" signs of the phase factors because this is information that is not revealed in experiments. However, we can adopt a phase convention which, if we stick to it rigorously, will always give results that are both internally consistent and consistent with experiment'. But in the social and behavioural areas in particular, one needs to tread carefully to ensure that one really is measuring what one wants to measure, and also that the measuring procedures have desirable characteristics. The next two subsections look at just some of these issues.

To conclude this subsection, we should comment on gold standards in measurement, and the role they might play in measuring wellbeing. A gold standard is the true value of the attribute being studied, and sometimes situations arise where it is possible or perhaps possible in principle, to measure this true value directly. For example, in studies of osteoporosis, we might regard radiography as leading to the true extent of bone deterioration (the gold standard). But for reasons of cost we might prefer to adopt a questionnaire based on items concerning age, diet, exercise, etc., which we know to give scores correlated with the radiographic result, and which are much quicker and cheaper to determine, as well as being non-invasive. Or, as another example, we might wish to know something about the true state of a disease so that we can treat it, in situations where the true state can be discovered only at a post mortem examination. Here we might again try to develop a screening instrument which is highly correlated with the true disease status.

Unfortunately wellbeing admits of no such gold standard. Indeed, as we have seen, the very complexity of the concept means that there are multiple interpretations of what is meant by 'wellbeing'. Even such straightforward approaches as simply asking people questions like 'are you satisfied with your life?' arguably touch on only certain aspects of wellbeing.

However, even though no gold standard exists, there are indicators which one might expect to be highly correlated with wellbeing. When this is the case, advantage can be taken of this expected relationship to test and refine potential definitions. For example, at the aggregate level, where we are trying to determine the wellbeing of a population, we might reasonably expect suicide rate to be negatively correlated with wellbeing. If it is not, it suggests either that our measure of wellbeing is missing something or that we have misunderstood something about the potential relationship between these two variables. Either way it will lead to exploration and improvement of understanding and the measures.

1.4.2 What is measured matters

In Section 1.2, we noted that one informal definition of wellbeing was 'what matters'. But this can be inverted, so that what is measured may be taken to be what matters – purely because the solid numbers assigned to it give it a spurious sense of accuracy, validity and reality. Many authors have cautioned against this mistake.