

Understanding and measuring quality of life in Ireland: sustainability, happiness and well-being

Briefing Paper for Comhar¹

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Abstract

In the last decade, the 'Celtic Tiger' economy grew at a record rate for a developed country. Nevertheless, there has been much concern regarding the implications of the pace of economic growth for localised environmental quality and life satisfaction generally. It has long been recognised by economists, psychologists and others that traditional macro-measures of national income such as GDP and GNP are inadequate measures of the performance of an economy and wider society – such measures are unable to give value to environmental and social capital and are unable to capture the performance of a country in sustainability terms. The briefing note outlines the various approaches to measuring quality of life and sustainability for Ireland specifically focusing on a modified genuine savings approach and the use of life satisfaction scores to measure well-being and individual happiness with life. The paper presents results for Ireland. Finally, the paper discusses the importance of this research for developing an evidence-base for public policy and sets out the need for investment in such research.

Introduction

The ultimate goal of public policy is the improvement of well-being in society. Economists have traditionally employed the concept of 'utility'² to measure welfare, which in traditional economic models is assumed to be an increasing function of present and future consumption of goods, leisure and amenities. Due to the difficulty of measuring utility, income was generally used as a proxy, using personal income at an individual level, and national income –Gross National Product (GNP) and Gross Domestic Product (GDP) – at the macro level, as measures of individual and societal performance. However it has long been recognised that such measures are poor indicators of the sustainability of an economy and society and of the quality of life or well-being of individuals and the population (e.g., United Nations, 1954; Erikson, 1993). As Robert F. Kennedy declared (perhaps rather generously) "*GDP measures everything...except that which makes our lives worthwhile*".³

Nevertheless, Western governments tend to prioritise macroeconomic growth, assuming that this will bring sufficient benefits and revenue to offset any consequent external and/or social costs. Individuals too are often resigned to an assumption that short term sacrifices are necessary to achieve financial stability or higher living standards in the long-run. However, the use of monetary indicators alone to measure performance run the risk of leaving governments in the position of having to resolve subsequent social problems such as inequality or low levels of social capital (e.g. poor community spirit and support) or environmental problems such as past pollution or excessive carbon emissions. For the individuals, the short-term sacrifices may include long working hours, impacts on family life, reduced social interaction, reduced amenity time, loss of environmental quality and possibly indebtedness. In some cases, personal lifestyle choices have to be made that may have adverse impacts on private incomes.

2 See Collison Black (1998) for a summary of economic thought on this concept.

3 Present John F. Kennedy, 18th March 1968.

Aside from the problems of measuring quality of life in terms of economic growth, there are problems with the measure itself. For example, GDP ignores household production such as the effort that goes into the rearing of children, the benefits that this provides for society and the public expenditure that is avoided. Neither are costs treated equally with the benefits. GDP counts all economic activities irrespective of whether they are positive or negative. For instance, expenditure on pollution abatement appears to increase GDP even though it is correcting the negative impacts of earlier economic output. Hence, there is a degree of double-counting.

A major criticism of economic measures such as GDP is that these tend to equate societal welfare with consumption measured according to revealed preferences based on purchases of material goods. An obvious problem with this approach is that there is no market for public goods such as environmental quality and or social cohesion. Consequently, environmental goods that may be critical to continued consumption and to sustainable development are abused or depleted in the absence of market prices that signal their true value or scarcity. Furthermore, environmental goods provide utility in their natural state as well as through consumption. As well as the stock of natural capital, there are issues in relation to the quality of the environment that may have a great influence on quality of life. Measures of GNP and GDP also exclude all interpersonal relationships not based on money and the destruction of utility is partly measured as output and thus raises GDP. Aspects of income distribution and its change are also neglected, though it is known that relative income matters greatly for well-being (Luttmer, 2004).

In addition to the problems of traditional macro measures of performance, personal and/or household disposable income has also been recognised as being inadequate to measure the well-being of individuals and this has been more fully acknowledged by economists in recent years (e.g., Ng, 1997; Frey and Stutzer, 2002a; Gowdy, 2004). The criticisms of using income as the dominant method of assessing well-being include that, while at the margin, utility (satisfaction) corresponds to price, this does not hold for the consumption for earlier (intra-marginal) units and hence, the value of the aggregate bundle of goods and services is seriously underestimated (Frey and Stutzer, 2002a).

In the last decade, the 'Celtic Tiger' economy grew at a record rate for a developed country. Nevertheless, there has been much concern regarding the implications of the pace of economic growth for localised environmental quality and life satisfaction generally (EPA, 2004a; Clinch, 2001). At the macro level it is far from clear whether the economy is on a sustainable growth pattern as this is not measured by GDP or GNP. In addition, anecdotal evidence would suggest that, despite significant increases in individual disposable income, people's perception of their well-being is that it has not increased. Despite increasing concerns at governmental level regarding quality of life and sustainability, there has been a lack of alternative measures to be used for the purposes of providing an evidence-base for policymaking. Sustainability, for example, has tended to be a term that is abused as those advocating it rarely define, in operational terms, what they mean by the phrase. At the same time, there is a lot of discussion of quality of life issues but little data upon which to act to affect improvements.

The questions to be addressed, therefore, in this briefing note are:

- if traditional income measures are inadequate indicators of the level of welfare in society, what new measures of sustainability and individual and macro quality of life should be used to measure performance?
- what do the current results from those measures tell us?
- what research is required to further develop such measures so that they can be used as an evidence-base for policy?

Improving macroeconomic measures of performance: sustainability measures

The impacts of economic growth on the environment and concerns about the long-run consequences of natural resource depletion and environmental degradation have revived the interest in the relationships among national income, wealth, and welfare. This interest is very marked in Ireland where impressive economic growth in the 1990s attracted the world's attention, but also generated questions regarding its implications for environmental quality and life satisfaction.⁴

As stated in the introduction, well-known macroeconomic measures, such as GNP or GDP, have often been taken as indicators of economic and social progress. The economic system's success or failure is assessed, most of the time, based on these conventional economic measures of growth. Economic growth, defined in this manner, obtains the highest priority in international and national agendas. However, the growth of national income so measured can be accompanied by the erosion of important assets that are not included into those indicators, but are very important for human and social well-being. Human, social and natural resources and the value of their depletion (economic depreciation) are not included in the United Nation System of National Accounts (SNA), even if the main purpose of national accounts is to provide a comprehensive view of a nation's economy (Repetto *et al.*, 1989).

Human capital generally refers to the health, well-being, and productivity potential of a society. Types of human capital include mental and physical health, proper housing and sanitation, education, and work skills. These elements do not only contribute to a happy, healthy society, but improve the opportunities for economic development through a productive workforce.

Social capital, like human capital, is related to human well-being, but on a societal rather than individual level. It consists of the social networks that support an efficient, cohesive society, and facilitate social and intellectual interactions among its members. Social capital refers to those stocks of social trust, norms and strengths of citizens' organisation that bind individuals and society together and help to create a more stable and trusting social environment that is also critical for efficient and sustainable economic activity (Serageldin and Steer, 1994). Examples of social capital include neighbourhood associations, civic organisations, and cooperatives. Political stability, democracy, government efficiency, and social equity are also considered part of social capital.

4 See Clinch (2001) for a broad overview of key environmental issues facing Ireland in the new millennium.

Natural capital constitutes the source of all economic activity. It provides a source of low entropy resources and it assimilates high entropy wastes. Natural capital is more than the sum of renewable and nonrenewable resources (biomass, stocks and energy flows). It provides a range of life support services necessary to maintain the habitability of the planet Earth (Jansson, *et al.*, 1994; Costanza *et al.*, 1997). All these services can be divided in: direct contributions to economic activity (raw materials, energy); goods and services for final consumption; services provided by the environment, which range from current values such as extractive uses (fish, pharmaceuticals), non-extractive uses (recreation, aesthetic), and maintenance of life support systems (watershed protection, nutrient cycling) to future values (options and existence values).

The current system of national accounts in most countries concentrates on labour and man-made capital in concordance with a Keynesian macroeconomic view that was dominant when the system was developed in the 1940s and 1950s (Repetto *et al.* 1989). The National Accounts are still the most important measures of overall economic activity and national income for a nation, but net national product cannot be an accurate indicator of sustainable income unless all market and non-market stocks of capital valued at the appropriate scarcity prices are considered in its calculation. In particular, the omission of fundamental nonmarket activities such as unpaid work, the value of leisure time, investment in human capital and the environment and health status, generated concerns that the accounts are incomplete and misleading from its very inception (Nordhaus, 2000).

The observation that environmental and social degradation and depletion can occur while GDP is growing, and that this depreciation can affect future sustainability and welfare, has lead a wide range of authors to criticize narrow measures of economic and social development since the early 1950s (Boulding, 1949-1950; Daly and Cobb, 1989; Repetto 1992; Fuà, 1993). Many of those have examined whether national income data adequately measures the level of changes in economic well-being. For example, Kapp (1950) recognised that the increase in national product was based on unaccounted irreversible environmental destruction. Galbraith (1958) made clear that the overexpansion of production and consumption could be seen as a "bad" rather than a "good" and criticised the overemphasis on high rates of production as a measure of economic prosperity, suggesting that other factors may be of greater importance.

It is clear that in order to have a better view about the performance of an economic system, some other more comprehensive macroeconomic "barometers" must be computed. Ekins (2000) provides an excellent synthesis on economic growth and sustainability from which much of this brief discussion is drawn. There is disagreement within the economics discipline, and even more so, between disciplines, on the concept of sustainable economic growth. For example, Daly (1990) views sustainable economic growth as an oxymoron whereas Goldin and Winters (1995) view economic growth and environmental protection as perfectly consistent. One's opinion should depend largely on the definition of 'sustainability'. This makes it all the more unhelpful that people generally, and politicians in particular, make widespread use of the term without explaining what they mean by it.

In the early 1970s, the concern was that economic growth would be limited by ecological constraints (the 'limits to growth' literature – see Meadows *et al.* (1974)). Whether one is convinced or otherwise by the limits to growth literature depends more or less on one's opinion as to substitution possibilities (e.g. the practicality of renewable in place of non-renewable energy sources) and the ability of humans to sustain technological progress (Lecomber, 1975)⁵. However, environmental economists would believe that, rather than manipulating economic growth directly to reduce the possibility that, as Meadows *et al.* (1974) described it, a "sudden and uncontrollable decline in both population and industrial capacity" might occur, policymakers should introduce a surrogate price on environmental goods that are free (e.g. for emissions to air) to reflect such (potential) damage⁶.

Ultimately, physical sustainability is limited by the second law of thermodynamics. The entropy law tells us that complete de-coupling of economic growth and the production of waste can never occur. However, many economists believe that the gap can be narrowed continuously by innovation and substitution in the time period of relevance to human existence. However, it is important to note that, even if there is a limit to physical sustainability, it is not necessarily optimal to restrict economic growth. The net benefits of development may outweigh the ultimate costs of physical unsustainability (particularly if externalities are internalised), i.e. the long-run destruction of environmental resources may be optimal. However, this controversial suggestion depends on how we tradeoff the future against the present ('discounting', which is of huge significance in the global-warming debate). Therefore, there may be a conflict between economic and environmental policy, although, to environmental economists, these policies should never be considered as separate.

Hirsch (1976) believes that the efforts of those who advocate a sudden crisis point being reached far in the future are misplaced. Rather, the concern should be with the overall welfare of society. Mishan (1977) puts this most strongly when he postulates that economic growth will actually end up reducing the welfare of society because of the negative externalities (spillovers) produced such as the declining architectural endowment, increased noise, and other pollution.

We take the approach that the key is to ensure that people's quality of life is sustainable. This is the focus of the economics literature on sustainability. Pearce *et al.* (1989) and Pezzey (1989) define sustainable development as some indicator of well-being that does not decline over time. The issue of intergenerational equity and the difficulty of knowing the preferences of future generations now emerges as an issue. Leaving this aside for the moment, if we assume that we can develop such indicators of well-being, the discussion moves on to the conditions required to satisfy this concept of non-declining well-being. The Hartwick (1977) Rule prescribes that rents from the exploitation of renewable resources should be invested in order to ensure constant consumption over time. Solow (1986) and Mäler (1991) view a constant capital stock as a necessary condition for ensuring constant consumption.

5 The literature on the economics of uncertainty is very relevant to this debate.

6 Once any environmental externalities are priced (e.g. using a carbon tax), price premiums or restrictions on the use of exhaustible resources should not be necessary if the market works well, as the price should reflect any potential scarcity and lack of substitutes in the future. In the oil market, this is complicated by the presence of a cartel.

The issue then revolves around the sort of capital we have in mind. Pearce and Atkinson (1995) see the overall capital stock as consisting of man-made (reproducible) capital (such as machines, buildings, roads), human capital (the knowledge and skill of people), and natural capital (which delivers ecological services). 'Weak Sustainability' is achieved when the overall capital stock does not decline whereas 'Strong Sustainability' involves conserving certain components of the natural capital stock while ensuring that the overall capital stock is sustained (Pearce *et al.*, 1996). 'Ecological' (as opposed to neoclassical 'environmental') economists, who favour the goal of strong sustainability, tend to use the concept of 'carrying capacity' which is defined in terms of ecological limits or 'sustainability constraints'. Such constraints include that pollution should not exceed the assimilative capacity of the environment and that the harvest of renewable natural resources should not be greater than natural growth (Pearce *et al.* 1996).

The comprehensive net investment measures employed in the early literature became operational in the late 1990s. The term "genuine savings" was coined to designate savings adjusted not only for depreciation of human-made capital stock but also for depletion of natural resources, degradation of the environment and human capital accumulation, and initial attempts towards their estimation were made (see e.g. Repetto *et al.*, 1989; Ahmad *et al.* 1989, Solórzano *et al.*, 1991; Pearce and Atkinson, 1993). Pearce and Atkinson (1995) identified the equivalence between nonnegative genuine savings and weak sustainability, and used the existence of nonnegative genuine savings as a test for whether a country's development is weakly sustainable. They found that many countries can be on an unsustainable path though their net savings conventionally defined are positive.

Although the savings rules have been criticised for being only concerned with weak sustainability (see, for example, Martinez-Alier 1995), Pearce, Hamilton and Atkinson (1996) convincingly argue that, even if some amount of a critical resource must be preserved to meet the criteria of strong sustainability, savings rules are still required for the remaining resources if sustainability is to be achieved.

Measuring sustainability: empirical studies

There have been some steps towards the inclusion of nonmarket activities into national accounting systems, but given the difficulty in finding even a satisfactory definition of sustainability, it is not surprising that 'operationalizing' the concept of sustainable income has proven complicated. The most remarkable efforts to broaden the set of productive assets considered when analyzing economic activity and computing the national accounts have fallen into four categories:

- (i) *Development of satellite accounts.* For example, the United States Bureau of Economic Analysis started considering the contribution of natural and environmental resources to the national income in this form in 1994 (see Landefeld and Carson, 1994).
- (ii) *Case studies.* Early efforts to construct comprehensive measures of net investment focused on individual countries, most notably Indonesia (Repetto *et al.*, 1989) and Costa Rica (Solórzano *et al.*, 1991). Pearce and Atkinson (1993) published the first cross-country estimates, but their estimates covered only 18 countries and a single year.

- (iii) *The World Bank's comprehensive estimates of net investment, or "genuine savings."* The World Bank's annual "Little Green Data Book" and the inclusion of genuine savings in its widely used cross-country database, the *World Development Indicators* (WDI) (Hamilton and Clemens, 1999), by the World Bank, are probably the most ambitious efforts so far.
- (iv) *Measures of the national wealth.* Some early attempts in the literature are Lange (2003) and Lange *et al.* (2003). Another ambitious project is the *World Bank's Wealth Estimates* (World Bank, 2006) where the classical concept of wealth of nations (Smith, 1776) is actually computed for each nation, by identifying and pricing, in addition to produced capital, natural capital and intangible capital (human capital, quality of institutions, governance).

Improving measures of happiness and quality of life: the subjective well-being approach

Just as monetary measures of macro performance are inadequate measures of performance, individual and household income is an inadequate measure of individual well-being. So what is the alternative? Psychologists have traditionally studied the determinants of subjective well-being and happiness (see Carr, 2004; Diener, 1984; Argyle, 1987; Myers, 1993 or Diener *et al.*, 1999 for a survey) and interpret life satisfaction scores as cardinal. Economists were once less convinced by this claim. However Oswald (1997) has pointed out that psychologists are, perhaps, more qualified to make this judgment. Recent theoretical studies have added weight to the claim that happiness scores are useful in the analysis of welfare (Kahneman *et al.* 1999; Ferrer-i-Carbonell and Frijters, 2004) and that they are interpersonally comparable (in Layard, 2005).⁷

The economic psychology literature employs happiness data from surveys as empirical approximations of individual well-being. The specific question asked varies throughout the literature in terms of subject matter (questions on happiness and life satisfaction are frequently employed) and range of scale (three-point to ten-point scales have been employed in the literature). Measures such as these have been found to have a high scientific standard in terms of internal consistency, reliability and validity (Diener *et al.*, 1999; Lopez, & Snyder, 2003) and have been used extensively in the economics literature in recent decades (see, e.g., Easterlin 1974; 1995; 2001; Veenhoven, 1997; Frey and Stutzer, 2000; Frey and Stutzer, 2002; Alesina *et al.*, 2004; Stutzer, 2004; Blanchflower and Oswald, 2004a; 2004b; Frijters *et al.*, 2004 or Bell and Blanchflower, 2004). Unlike traditional economic tools for the estimation of implicit prices of non-market goods, this well-being approach does not require awareness of cause-effect relationships on the part of the individual (Welsch, 2006). Moreover, evidence from neuro-science suggests that subjective well-being measures are associated with a physiological response (Layard, 2005).

Researchers have examined the impact on life-satisfaction of personal life (e.g., Oswald, 1997; Frey and Stutzer, 2002 or Stutzer, 2004); political institutions (e.g., Frey and Stutzer, 2000); the macroeconomy in general (e.g., Oswald, 1997; Di Tella *et al.*, 2001); and environmental factors (e.g., van Praag and Baarsma, 2005; Welsch, 2006; Brereton, Clinch and Ferreira, 2006a, 2006b). The macroeconomic characteristics examined include income, unemployment and inflation (e.g., Clark and Oswald, 1994; Gerlach and Stephan, 1996; Oswald, 1997; Di Tella *et al.*, 2001).

7 Sen (1999) states that in judging alternative policies, interpersonal comparisons of utility are both necessary and desirable.

Mainstream economists had assumed an increase in well-being with rises in income, but empirical literature suggests that the link is ambiguous (e.g., Easterlin, 1974; 1995; 2001). This limited role of income as a determinant of life satisfaction has lead authors to examine income aspirations (e.g., Easterlin, 1995; Stutzer, 2004; Frijters *et al.*, 2004; Gardner and Oswald, 2001; 2004), positional externalities (e.g., Frank, 1997; 2003) and inequality (e.g., Alesina *et al.*, 2004) as further influences. The general result is that some measure of relative income has a significant impact on self-reported life satisfaction (e.g., Easterlin, 2001; Luttmer, 2004). Factors such as health and family circumstances tend to show a more marked influence on quality of life than standard economic measures (e.g., Clark and Oswald, 1994; Winkelmann and Winkelmann, 1998). Further refinements include the examination of the effects of institutional factors such as the degree of democratic participation (e.g., Frey and Stutzer, 2000; 2002) and environmental factors (e.g., van Praag and Baarsma, 2005; Welsch, 2006, Brereton, Clinch and Ferreira, 2006a, 2006b).

Measuring happiness and well-being: empirical results

Employment status (especially unemployment) is found to have profound effects on individual well-being, independent of income. Being employed, self-employed, retired, or in full-time education (Di Tella *et al.*, 2001; Blanchflower and Oswald, 2004a; Frijters *et al.*, 2004) is associated with high well-being, while being engaged in household duties is associated with reduced well-being (Stutzer, 2004; Blanchflower and Oswald, 2004a), other things being equal.⁸

Unemployment has been found to be the primary economic source of unhappiness (Oswald, 1997). Contrary to traditional economic belief, unemployment has negative impacts on the mental state of the individual (see, e.g., Darity and Goldsmith, 1996; Bjorklund, 1985 or Mayer and Roy, 1991) above and beyond any fall in income (Clark and Oswald, 1994; Winkelmann and Winkelmann, 1998) and to 'compensate' men exactly for unemployment would take a rise in income of approximately \$60,000 per annum (Blanchflower and Oswald, 2004a). The most obvious cost of unemployment is to the unemployed themselves, firstly, through the direct financial cost of loss of earnings, but also the more personal costs, such as loss of job skills, self-esteem and increased stress.⁹ The general finding is that unemployment is associated with substantial negative non-pecuniary effects (see, e.g., Jensen and Smith, 1990). Additionally, Winkelmann and Winkelmann (1998) report that the social costs of unemployment substantially exceed the costs of an economy operating below its potential. This literature has also concluded that unemployment affects a male more severely than a female, that it is easier being unemployed once one has been without work for some time (e.g., Blanchflower and Oswald, 2004a), but that it is harder being unemployed when the unemployment rate is low (e.g., Clark and Oswald, 2002; Bell and Blanchflower, 2004).¹⁰ Di Tella *et al.* (2001) examine unemployment at the macro level and show that people are happier when the unemployment rate is low.

8 These results do not hold consistently across countries however. Frey and Stutzer (2000), for example, in their study of Swiss cantons, find housewives to be more satisfied than the employed and Blanchflower and Oswald (2004b), in their study of happiness in the United States, find no statistically significant difference between housewives and the employed.

9 These and other costs are documented in, for example, Clark and Oswald (1994).

10 However, Winkelmann and Winkelmann (1998) find no evidence that the long-term unemployed get used to their situation and partially recover from the initial adverse effect.

Further evidence of the importance of employment status on well-being is found in individuals' responses to questions on work commitment after hypothetical lottery wins. These studies find that a large proportion of individuals would prefer to continue working rather than leave their jobs after a large windfall gain (reported in Layard, 2005). Employment is not only a source of income to individuals but also a provider of social relationships, identity in society and individual self-esteem (Winkelmann and Winkelmann, 1998). Brereton, Clinch and Ferreira (2006) extended the international literature to examine the welfare impacts of additional employment status categories on well-being, including part-time employment, disconnection from the labour force and being disabled, unable to work. They find that being long-term unemployed, disabled and unable to work or in part-time employment has a significant negative effect on life satisfaction, particularly for males.

This literature consistently finds that married individuals are more satisfied than are the single (never-married), separated, divorced or widowed (e.g., Clark and Oswald, 1994; Blanchflower and Oswald, 2004b) and that the divorced, separated and widowed are less happy than singles (never married) (e.g., Alesina *et al.*, 2004). Studies of self-reported happiness also indicate that the married are happier than the unmarried and the co-habiting (e.g., Bradburn, 1969; Bell and Blanchflower, 2004), that couples without children are happier than singles, single parents and people living in collective households (e.g., Frey and Stutzer, 2000) and that couples with young children are much more satisfied than singles with young children (Stutzer, 2004). Clark and Oswald (1994) find that married people have the lowest degree of mental distress, while Gardner and Oswald (2001) provide evidence that marriage has a much more important (positive) effect on longevity than does high income.

The psychological literature on well-being provides insights into these findings.¹¹ Research in this field has found that married couples are higher in their degree of mutual support than are other couples, the never married (e.g., Stack and Eshleman 1998; Joung *et al.*, 1997) and other social groups (Stroebe and Stroebe, 1987) and marriage is believed by psychologists and psychiatrists to provide a protective effect to well-being (e.g., Argyle, 1989; Cochrane, 1996). Status integration, selectivity and marital protection theories assert that, compared with unmarried individuals, married individuals have more social bonds, are healthier and exhibit favourable psychological behaviour.

Along the lines of the social causation theory, the literature on personal well-being tends to find that married individuals, especially married men, experience less stress and emotional pathology than do their unmarried counterparts, because they have continuous companionship with a spouse who provides interpersonal closeness and emotional support in dealing with daily stress (Gove, 1973). Coombs (1991) reviews 130 empirical studies on a number of well-being indices and suggests that these indicate that

11 Two theories are generally put forward as to why married persons report greater happiness than their separated, divorced, remarried and never married counterparts. Social causation theory contends that marriage increases happiness by providing emotional and financial support to both spouses (Stack and Eshleman, 1998; Coombs, 1991; Joung *et al.*, 1997). In addition, according to this theory, married individuals are more likely to avoid health damaging behaviour such as smoking and excessive alcohol intake and lead more secure and scheduled lifestyles (Rogers, 1995). On the other hand, social selection theory contends that persons who are already high in qualities like psychological health or financial status are more likely to marry in the first place (Stack and Eshleman, 1998).

married men and women are generally happier and less stressed than the unmarried. Glenn and Weaver (1981) find that the estimated contribution of marital happiness is far greater than the estimated contribution of seven other aspects of life, ranging from work to friendship. Additionally, some authors have looked at the impact of being married on well-being, through the expansion of financial resources (Rogers, 1995) and the physical health and provision of emotional support effects (e.g., Joung *et al.*, 1997). Hughes and Gove (1981) found that the difference, in relation to well-being, is between married people and others, not between people who live alone and others.

McCrane (1989) proposes that the objective of the marriage contract itself is the efficient production of children and hence it could be hypothesised that the successful fulfilment of this objective leads to greater happiness. However, some theorists suggest that children actually decrease the physical and psychological well-being of parents, especially mothers (e.g., Clark and Oswald, 1994; Ross *et al.*, 1990). Additionally, the effect of children on well-being has been found to be either negative or neutral (Ross *et al.*, 1990; Glenn and McLanahan, 1981).

The bulk of research on single parenthood is in relation to parental quality (e.g., Hanson and Sporakowski, 1986) and child welfare (e.g., Asmussen and Larson, 1991 or Hall *et al.*, 1995) rather than well-being. However, the literature suggests that single parent households hold a disadvantageous position in society relative to other family groups since they are characterised by a high rate of poverty, minority representation, and low mobility and education, and that this is more often true for single mothers than for single fathers (Hall *et al.*, 1995).¹² In the life-satisfaction literature, studies have found that single parents are less happy than married parents (Frey and Stutzer, 2000). Additionally, research has found that single mothers are at a particularly high risk of job/family role strain and reduced levels of physical and emotional well-being (Hanson and Sporakowski, 1986), although Veroff *et al.* (1981) indicate that single parents experience more parental satisfaction and fewer strains associated with parenting than do married parents.

In recent papers on well-being, authors have begun including a more diverse range of dummy variables for household formation, examining the effect of partnerships on life satisfaction (Frey and Stutzer, 2004) and also household size, number of children and a number of different variables describing household composition. Stutzer (2004) examines couples with grown up children, single parents with young children, single parents with grown up children and single respondents living with parents. He finds that couples are more satisfied than singles, but not statistically significantly so. In addition, Frey and Stutzer (2000) control for 'other private household' and 'collective household'. Brereton, Clinch and Ferreira (2006) extended the international literature to examine the role of adult support in the household on well-being. They find that the large negative effect of being a single parent on life satisfaction, found in the literature, is present only in households in which there are no other adults.

12 Hall *et al.* (1995) find that single mothers reported slightly less education, but approximately 50 per cent less household income than single fathers. Rogers (1995) reports that in the US in 1990, 33 per cent of female-headed families with no husband present lived in poverty, compared to just 5.7 per cent of married couples.

Additionally, the role of location-specific factors in explaining life satisfaction has recently started to be explored. In the last few years, authors have started analyzing the trade-offs between life satisfaction and specific environmental attributes. This literature has led to an alternative method for measuring the value of environmental amenities¹³ i.e., using individuals' responses to questions on their overall well-being to estimate the impact on utility of specific attributes. Unknown to the individuals themselves, their answers move systematically with changes in environmental attributes (van Praag and Baarsma, 2005).

The connection between the environment and human psychology has been studied for some time¹⁴ (Kellert and Wilson, 1993). The benefits of environment can vary from active recreational uses to passive use in terms of viewing scenic landscapes (Carson *et al.*, 2003). The growing application of subjective well-being indicators in the economic literature as measures of well-being, has led researchers to examine the impact on utility from changes in terrorist threats (Frey *et al.*, 2005), climate change (Rehdanz and Maddison, 2005), environmental attitudes (Ferrer-i-Carbonell and Gowdy, 2005), aircraft noise (van Praag and Baarsma, 2005) and air pollution (Welsch, 2005).

Welsch (2002) examines the trade-off between prosperity and environmental quality while van Praag and Baarsma (2005) value the cost to individuals from aircraft noise and find it to be high. Frey and Stutzer (2002) argue that happier people may be more likely to exhibit positive attitudes toward the environment, Rehdanz and Maddison (2005) examine the influence on well-being of climatic conditions, Welsch (2005) uses life satisfaction scores to value air pollution in European countries while Frey *et al.*, (2005) in their analysis of the negative affects on well-being of terrorism, measure the level of terrorism across three regions (namely, Northern Ireland, the Republic of Ireland and the United Kingdom).¹⁵

Van Praag and Baarsma (2005) examine a localised problem and use postcodes to link their respondents to objective noise burden. Ferrer-i-Carbonell and Gowdy (2005) include a set of dummy variables indicating the region where the individual lives. These variables are included in order to capture the (natural) environment where individuals live proxying, for example, London and Manchester as polluted areas. In Brereton, Clinch and Ferreira (2006a) factors such as population density, access to and quality of facilities and services, environment and climate, are shown to be extremely important determinants of well-being. Brereton, Clinch and Ferreira (2006a) advanced the international literature further by using Geographic Information Systems (GIS) to link individuals spatially to the amenities and disamenities in their area in order to analyse the extent to which individuals, their surroundings and well-being are interrelated. As in the previous literature, they find that environmental amenities have a direct impact on well-being. However, the proximity to, and type of, amenity are important. For example, access to transport emerges as both an amenity and disamenity, depending on the transport type. Proximity to international, national and regional airports and major roads are found to influence well-being differently, depending on the proximity of individuals to them.

13 The utility from these public goods (or bads) is inherently difficult to measure as they are not traded on the open market and hence do not command a price.

14 Hardin (1964) is a seminal contribution.

15 Sample homogeneity problems may arise in this approach, however, as terrorism in Northern Ireland is generally restricted to isolated areas in West Belfast.

Empirical Results for Ireland

This section presents the results that are currently emerging from research at UCD into the measures presented above.

Sustainability indicators for Ireland: genuine savings and total wealth

The World Bank first published cross-country estimates of genuine savings in 1997 (World Bank, 1997). It began including them in the WDI in 1999. The 2006 WDI contains estimates for about 200 countries, including Ireland, during 1970-2004 (partial series for some countries). Following the definition of weak sustainability, the Bank constructs these estimates by making a series of adjustments to gross national savings. First, a depreciation allowance for human-made capital stocks is deducted to obtain conventional net national savings. Second, a proxy for investment in human capital (the current public expenditure on education – in standard national accounting these expenditures are treated as consumption) is added to net national savings. Third, depletion allowances for a variety of natural resources (fossil fuels, minerals and timber) are deducted to reflect the decline in asset values associated with their extraction and harvest. And fourth, deductions are made for damages from carbon dioxide and particulate emissions.

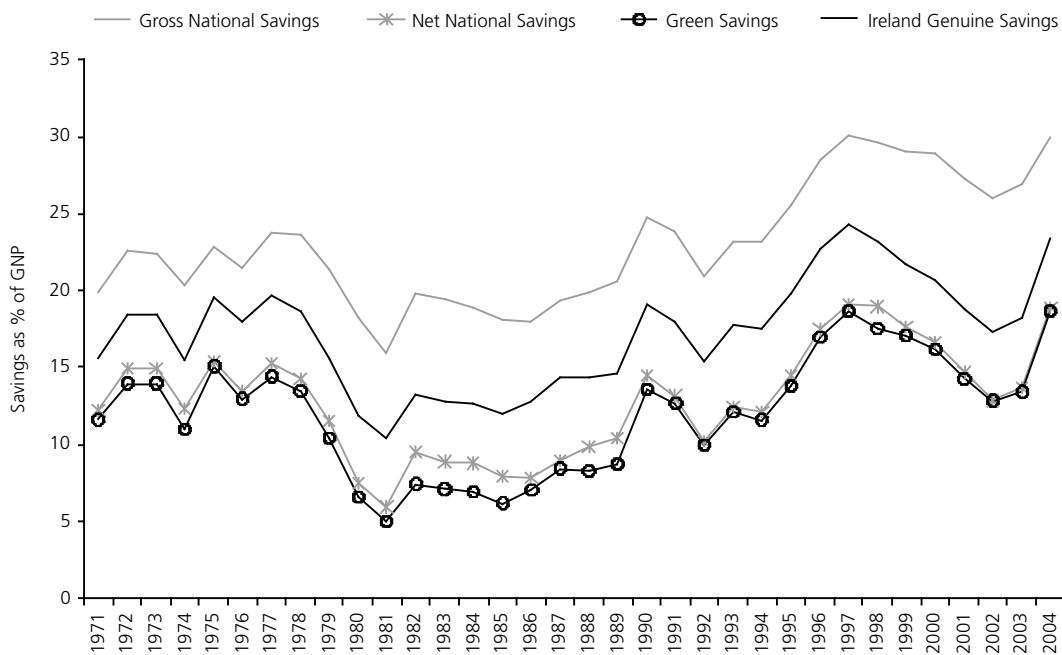
As Pearce and Atkinson (1995), Hamilton and Clemens (1999) used the genuine savings indicators to test whether a country's development path is weakly sustainable: countries with persistently negative genuine savings are on an economic unsustainable path. They also found that many countries fail this test even when their 'conventional' net savings are positive. The same test can be applied to Ireland. From Figure 1 it is clear that Ireland has consistently exhibited positive and increasing savings rates over the last three decades. In Figure 2 the trend of Irish Genuine Savings is compared with selected and comparable high-income countries. As shown, Ireland performed better than the average of the OECD countries and its performance over time is lower to Singapore and Korea only.

However, as Clinch (2001) points out, the World Bank data do not capture Irish-specific aspects of quality of life. In particular, the estimates on environmental degradation used by the World Bank do not include emissions of Sulfur dioxide, Carbon monoxide, Nitric oxide and Nitrogen dioxide, Nitrous oxide and Volatile Organic Compounds¹⁶. Other environmental aspects not captured in the genuine savings estimates especially relevant to Ireland are noise pollution, road congestion and water quality. Together with these environmental features, very important for a developed country are performances in health, human capital accumulation and its quality. More generally, the omission of adjustments to other assets from the World Bank estimates is due to the cross-country focus of the WDI and the lack of internationally comparable data.

16 Recently the World Bank has started including emissions of PM10 in its adjustments to savings. However, these estimates are available only from 1990 (WDI, 2006).

Table 1 and Table 2 compare the good performance of Ireland in terms of Genuine Savings in 2004 with other countries. When Genuine Savings is expressed as a percentage of GNI, Ireland ranked 9th in the world and 3rd among the high-income countries. A significant weakness, among those already discussed, is that Genuine Savings tend to favour small countries and economies that consume imported energy (Singapore, Korea, Hong Kong, Luxembourg and also Ireland) rather than resource-based economies that depend on energy extraction and production, no matter if they are classified as high or low income countries (Oman, Saudi Arabia, Chad, Uzbekistan, Kuwait, Trinidad and Tobago, etc.).¹⁷

Figure 1: Savings Indicators – Ireland (% of GNI)



Gross Savings = Gross national income – total consumption + net current transfers

Net Conventional Savings = Gross Savings – Consumption of Fixed Capital

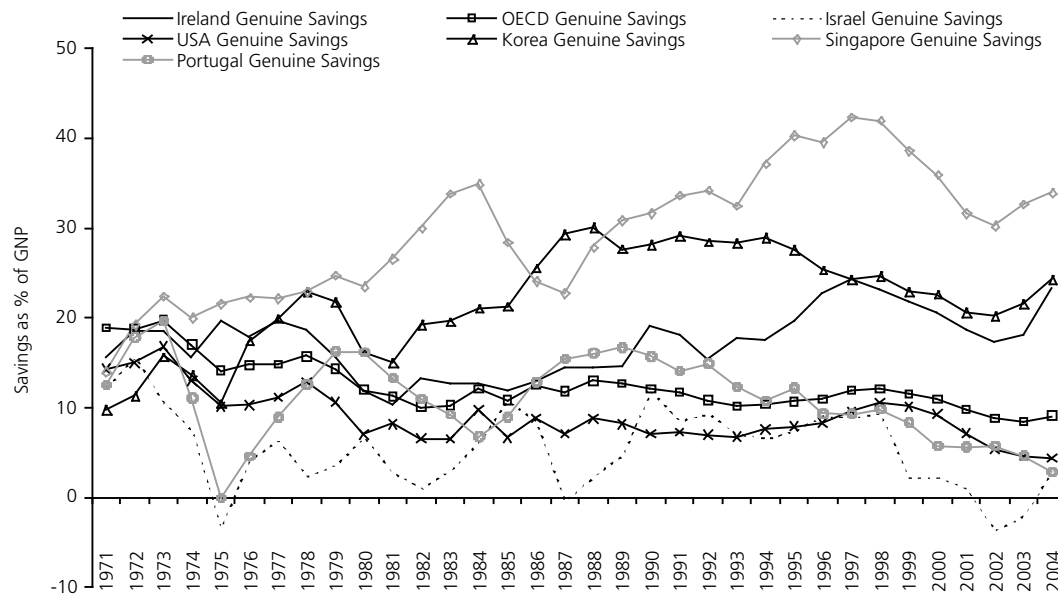
'Green' Savings = Net Conventional Savings – Energy and mineral depletion – Forest depletion

'Genuine' Savings = 'Green' Savings + Education Expenditure

Source: Authors' calculations from WDI (2006) estimates.

17 The high ranking of Botswana in Table 1 is mainly due to the exclusion of an adjustment for diamond extraction from the genuine savings figures.

Figure 2: Genuine Savings – comparison with selected high income Countries



Source: Authors' calculations from WDI (2006) estimates.

Table 1: Genuine Savings estimates, 2004

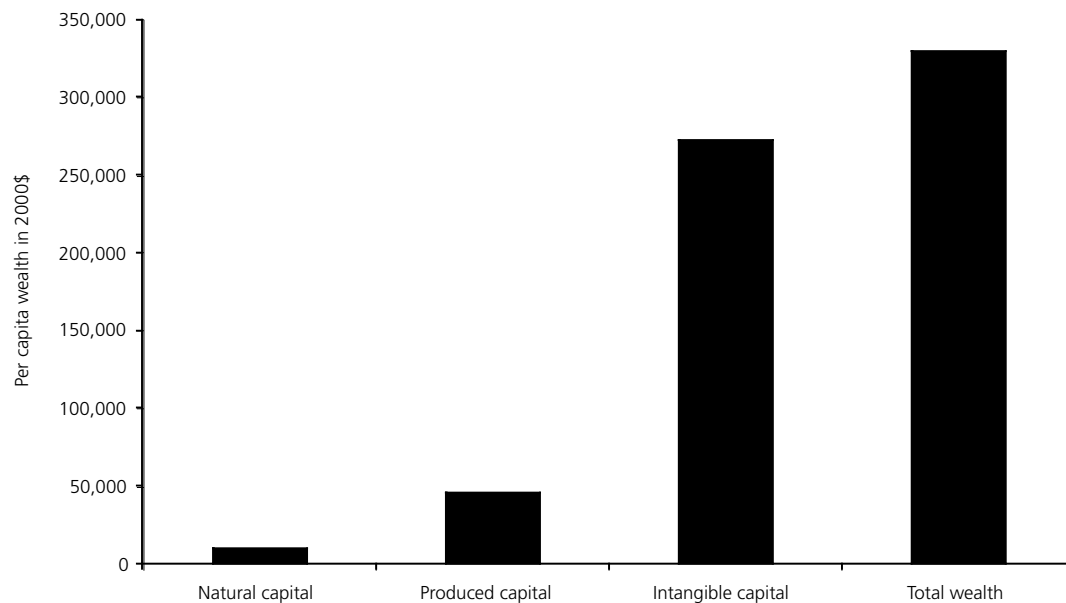
Top 10 Countries	Genuine Savings as % of GNI
1. Namibia	34.53
2. Singapore	33.94
3. Botswana	30.75
4. China	29.27
5. Maldives	28.39
6. Mongolia	26.60
7. Philippines	26.15
8. Korea	24.23
9. Ireland	23.40
10. Morocco	22.53
Bottom 10 Countries	
1. Chad	-81.51
2. Oman	-39.45
3. Azerbaijan	-39.26
4. Uzbekistan	-36.31
5. Angola	-35.22
6. Trinidad and Tobago	-28.29
7. Congo, Rep.	-27.81
8. Syrian Arab Republic	-27.47
9. Nigeria	-27.27
10. Kazakhstan	-25.07

Table 2: Genuine Savings estimates for selected high income Countries, 2004

Top 10 high income Countries	Genuine Savings as % of GNI
1. Singapore	33.94
2. Korea, Rep.	24.23
3. Ireland	23.40
4. Hong Kong, China	21.46
5. Sweden	19.44
6. Luxembourg	19.00
7. Slovenia	17.41
8. Austria	15.17
9. Japan	14.93
10. Norway	14.87
Bottom 10 high income Countries	
1. Saudi Arabia	-10.11
2. Bahrain	-9.28
3. Kuwait	-7.79
4. Portugal	2.79
5. Israel	2.82
6. United States	4.38
7. Canada	5.53
8. Australia	6.06
9. Iceland	7.95
10. United Kingdom	8.19

Source: Authors' calculations from WDI (2006) estimates.

A country's income and economic well-being depend on its wealth, where wealth is defined in the broadest sense to include produced, natural, human and social capital. Economic development can be seen as a process of 'portfolio management' that seeks to optimise the management of each asset and the distribution of wealth among different kinds of assets. This simple idea can be operationalised in Ireland only when comprehensive estimates of the total wealth of Ireland are provided. Again the World Bank provides some crude estimates for the year 2000 (Figure 3). The same general drawbacks discussed previously for the Genuine Savings estimate can be applied here, in this case for the definition of Irish natural capital.

Figure 3: Composition of national wealth – Ireland

Source: Authors' calculations from World Bank (2006a) estimates.

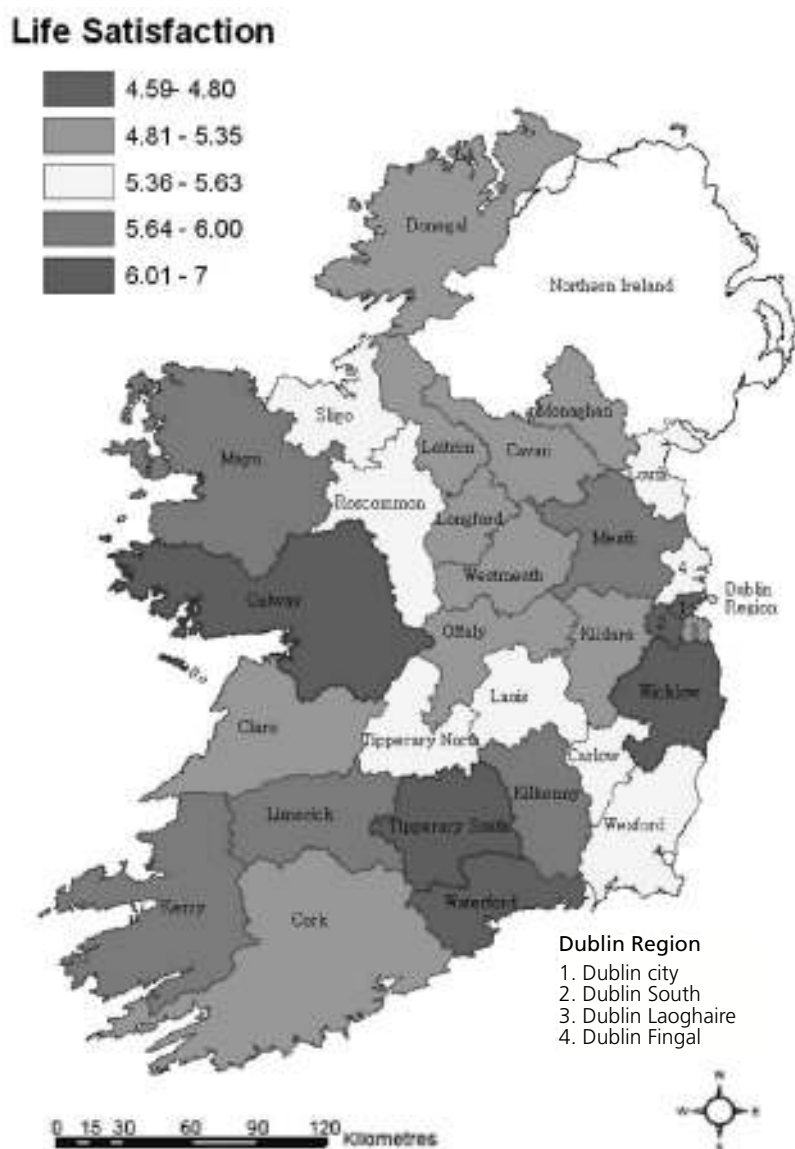
Subjective well-being, quality of life and happiness: empirical results for Ireland

The analysis of well-being in Ireland is interesting due to the record growth of the 'Celtic Tiger' economy and its ranking by the Economist Intelligence Unit (2004) as first in its quality of life league table for 2005. Work analysing the determinants of subjective well-being at UCD utilises data from a survey of a nationally representative sample of 1,500 men and women, aged 18 and over and living in Ireland, interviewed in 2001 combined with 'objective' environmental and other datasets. The well-being indicator (or proxy for individual utility) is based on the answers to a question (which was preceded by a range of questions regarding various aspects of the respondent's life) where respondents were asked to rate their life satisfaction on a seven-point scale (with seven being the highest). The survey found a high well-being in general in Ireland with an average of 5.5 on the seven-point scale.

Figure 4 shows variations in subjective well-being in Ireland. It illustrates that life satisfaction is above average in the local authority areas of Galway, Wicklow and Tipperary South, average in Mayo, Sligo and Meath and below average in the local authority areas of Dublin City, and Dublin South (see Figure 4 for a complete comparison). An obvious question arising from these simple comparisons of means is what are the factors explaining these variations in well-being? For example, why, with a higher average income per capita, would respondents in the Greater Dublin Area report lower well-being compared to peripheral regions?

In order to answer such questions, it is necessary to use regression analysis. This statistical method allows us to understand the extent to which a particular factor (e.g. age) 'explains' the level of happiness of an individual independent of all other factors (e.g. income) or, in other words, everything else being equal.

Figure 4: Average Well-being by Local Authority Area (seven point scale, 1 – 7)



Source of blank base map: Ordnance Survey Ireland (license pending)

To date, our work has focused on the influence of the following important life domains and policy areas:

- Economic/Financial
- Social
- Environmental

Economic/Financial

Income is significantly related to life satisfaction – but only to a point. An increase in gross household income of €47,600 would be required to increase life satisfaction by one category out of seven. We also find a threshold level of income (a gross household income of €57,900), after which returns to well-being from higher income rapidly diminish.

Employment status is another domain that has a significant influence on life satisfaction. In well-being terms the self-employed are happiest, along with the retired and students, then the full-time employed. Unemployment substantially reduces well-being, as does involuntary disconnection from the labour force. In a full-employment economy, it seems that being long-term unemployed, when everyone else appears to have a job, makes people considerably less happy. Also, part-time employment appears to be a considerable source of unhappiness for males in particular. This result is consistent with the international literature.

Owning your home outright is associated with higher life satisfaction compared to living in a dwelling owned with a mortgage or renting. However, living in social housing is associated with the lowest life satisfaction of the tenures examines, other things being equal.

At the macro level, the international literature shows that happiness moves systematically with changes in the unemployment rate and the inflation rate (Di Tella *et al.*, 2001).

Social

Our results show that satisfaction with life has an inverted U-shape association with age suggesting that the young and old are least satisfied with their lives, with a turning point at 55 years. Also, males are less satisfied with life than females.

Being separated or divorced is negatively associated with life satisfaction compared to being single. However, we find no difference between married and single respondents, contrary to the bulk of published literature. A possible explanation is Ireland's low divorce rate. Stack and Eshleman (1998) suggest that in such circumstances, more couples may be 'trapped' in unhappy marriages.

With regard to children, having three or more is associated with less contentment, compared to having none. In terms of education, individuals with middle or higher education are more satisfied with life than those with a lower education level. Examining health, we look at both objective (number of times the respondent has visited their doctor in the past year) and subjective measures (self reported health). We find an inverse relationship between number of doctor visits and life satisfaction, but that self-reported health and life satisfaction are highly (positively) correlated.

Other interesting results include that when comparing the well-being of married males and married females, gender emerges significant only for married males, indicating that they are less satisfied with life than are their married female counterparts and, indeed, less happy than single males!

We find that being a single parent is negatively associated with life satisfaction. Everything else being equal, being in this position reduces life satisfaction by over one third of a category on the seven point scale. However, this large negative effect of being a single parent on life satisfaction is present only in households in which there are no other adults. The lone parent group in our sample consists entirely of females.

Environmental

The results above highlight the role of socio-economic and demographic variables as important determinants of well-being. This section considers the influence of amenities such as climate, environmental and urban conditions as factors affecting subjective well-being. Our results show that factors such as population density, proximity to coast and access to and quality of facilities and services are important determinants of well-being.

The analysis was then extended beyond what has been carried out to date in the international literature. Geographic Information Systems (GIS) techniques were utilised to link individuals spatially to the amenities/disamenities in their area at a high level of accuracy, such that a coherent analysis of the extent to which individuals, their surroundings and well-being are interrelated, could be carried out. We find waste facilities in an individual's area to be a disamenity. The type, and distance from, the waste facility, matters however. The presence of a landfill site in operation in the respondent's electoral division emerges as negatively related to well-being, compared to respondents whose electoral divisions are more than ten kilometres away. There is evidence suggesting that noise, smell and other negative externalities from waste facilities of this kind may impact negatively on well-being or quality of life (DG Environment, 2000). The intermediate distances of three and five kilometres from the facility emerge insignificant. Interestingly, proximity to a hazardous waste facility does not seem to have an influence in terms of life satisfaction.

Coast emerges as positively related to well-being, but the distance from the coast is important, with those living two kilometres or less from the coast more satisfied with their lives by over three-quarters of a category (on a seven point scale), compared to those living more than five kilometres from the coast. Those living between two and five kilometres from the coast are also more satisfied, but the effect is reduced, to one third of a category. Interestingly, proximity to beach emerges insignificant in the regression. It may be that, given Ireland's climate, the amenity value of coastal areas lies not in their traditional sunbathing use!

We find access to transport emerges as both an amenity and disamenity, depending on the type, and distance from, the particular amenity. Life satisfaction is highest for those living more than thirty, but less than sixty kilometres from both an international and national airport. It may be that those less than thirty kilometres away are affected by the noise disamenity, while those more than sixty kilometres lack access. In relation to regional airports, the amenity value lies at less than thirty kilometres. This result is not unexpected as these are small airports and only deal with smaller, less noisy aircraft and would have significantly fewer arrivals and departures than do the larger airports. Close proximity to a major road (less than five kilometres) emerges as a disamenity. This may be capturing the noise affects of this transport route. Access to a seaport appears to have no direct effect on life satisfaction.

Environmental amenities emerge as having particular relevance in explaining the disparities between Dublin and the other regions of the Country as shown in Figure 4 above. The analysis shows that when environmental amenities are included in a regression explaining subjective well-being in Ireland, they go a long way to explaining the differences in happiness observed between Dublin and the regions. It appears that issues such as overcrowding, congestion, and the disamenity effect caused by close proximity to major transport routes, are major causes of unhappiness in the Dublin region.

Towards an evidence-base for policymaking

Any policy should be based on a sound scientific basis. A long-term research programme has an important role in providing for evidence-based policymaking. It supports policy development, implementation and evaluation; and provides evidence to inform and support ministerial decisions. The basing of policy decisions on sound research promotes better government by:

- Enhancing decision making
- Promoting more consistent policymaking
- Replacing short-term views with long-term planning
- Reducing the influence of vested interests
- Minimising criticism of policy by independent analysts
- Enhancing the political acceptability of government decisions

In the UK, HM Treasury has promoted the development of evidence-based policymaking. Each government department has a budget line for research to, *inter alia*, enhance decision making and to enable a case to be made for funding from the Exchequer. The UK Government is currently investing in research into alternative measures to traditional monetary measures including those set out in this paper. The UK Prime Minister, Tony Blair, has commissioned research into the determinants of well-being and David Cameron is rumoured to be concentrating his policies on those factors that most influence individual happiness. DEFRA is taking the lead in the UK as seeing one of its primary roles as a making people happier and all local authorities are charged with this mission.

While Ireland's GDP and GNP have risen dramatically, research shows that money is only one factor that influences the well-being of society. Moreover, monetary measures at the macro level give no indication of the sustainability of an economy. It is essential, therefore, that the Irish Government invests in research that provides an evidence-base that allows more sophisticated policymaking in comparison to the reliance on such traditional monetary measures.

Current attempts within the Central Statistics Office Ireland (CSO) to account for environmental pressures involve the publication of environmental indicators starting in the 1990s mainly on waste, air quality and transport (see <http://www.cso.ie/statistics/EnvironmentalAccounts.htm>). The Environmental Protection Agency (EPA) also collects data on physical environmental performance. Much additional work, however, is needed to integrate them into the national accounting systems. Most fundamentally, an economic valuation of the impacts currently measured in physical units, is needed. As opposed to the

general indicators published by the World Bank, indicators constructed specifically for Ireland can benefit from a broader set of data sources and thus are expected to be more accurate. In addition, a bottom line adjusted savings tailored for Ireland should be a better indicator of Irish sustainability than the World Bank measures since additional adjustments most relevant to Ireland could be incorporated. For example, these adjustments could include: a valuation of the status of stocks and changes of stocks over time, such as human capital and environmental stocks such as fisheries and forestry; indicators of quality of air and water quality, change in land use, noise pollution and traffic congestion and their monetary valuation. The derivation of accurate and reliable comprehensive genuine savings accounts for Ireland is essential to ensure that Ireland's rapid growth is sustainable.

Overall, the principal goal of public policy should be to improve the well-being of individuals and society. How can you do this if you do not know the most important factors that influence the well-being of Irish people? How do you set priorities for public policy? This paper has set out a methodology for providing the evidence required to advance the sophistication of policymaking substantially.

As examples, our results show that:

- the negative effects of unemployment, over and above any fall in income, suggest that in terms of macroeconomic policy, in concurrence with the existing international commentary on the subject (Oswald, 1997), the maintenance of full-employment is more important than maximising incomes in a rapidly growing and rich economy
- low inflation should be a priority in terms of economic policy
- there is a target level of income for households beyond which changes in absolute income do not significantly increase happiness but how people rate themselves compared to their peers is important
- as expected, better health makes people happier
- men are less happy than women and, while marriage is beneficial for females, there is something unusual in Ireland in that married men are not happier than single men
- single parents are substantially less happy, everything else being equal, but only when they live alone, i.e. this is not driven by any stigma but rather by lack of adult support in the household
- investment in education increases happiness in addition to contributing to a knowledge-based economy
- access to facilities and services directly increases life satisfaction
- residing in social housing, independent of income, makes people unhappy
- those who drink more than the recommended weekly limit of alcohol are less happy with life
- environmental amenities as very important determinants of well-being. These directly affect life satisfaction. Tracking changes in environmental quality and how this impacts on well-being is thus crucial. It is imperative that policy makers are equipped with the evidence that allows them to assess if changes in environmental resources, as economic development takes place, are really to the benefit of society
- Dubliners are significantly less happy and this is driven by environmental factors

Future research can answer the following policy questions:

- Are the determinants of well-being dynamic or static over time? This will have implications for setting priorities for government policy – economic, social, or environmental.
- In which direction does the causation between variables such as marital status and employment status and well-being run? Do people drink because they are unhappy or are they unhappy because they drink?
- Why, in contrast to the international literature, do Irish married couples report no higher life satisfaction than their single counterparts? This has implications for social policy.
- What are the factors driving the particularly low well-being of lone single parents – financial, social etc.?
- How do the determinants of quality of life differ between the genders? This will have implications for gender policy as already seen above in the case of part-time employment.
- Why, when it is associated with such a negative life satisfaction outcome, do individuals become disconnected from the work force? This will have implications for labour policy.
- Why does satisfaction with life in Ireland have an inverted U-shape association with age, suggesting that the young and old are least satisfied with their lives? This is in contrast to the international literature.
- Are there regional disparities in quality of life which must be addressed and how do we address these?
- How can we improve social capital, i.e. more cohesive networks of supports, and what is most important for improving well-being?
- How important is family functioning for improving the happiness of people in later life?
- Do people differ at a regional level in terms of how various attributes influence their well-being?
- What is the value of having amenities such as parks, beaches and sports facilities?
- Does proximity to an incinerator really reduce people's life satisfaction?
- How important is a good transport network for improving the quality of life of people?
- Does traffic congestion negatively affect people's well-being?
- Does proximity to a hospital improve life satisfaction?
- What are the implicit prices of environmental amenities that do not command a market price? For example, this methodology allows researchers to price what individual would be willing to pay for an improvement in clean air and these figures could be used to tax polluters. This would have influence over the setting of environmental taxes, general economic policy and in terms of compensation, especially in relation to the location of land fills.

Research on the determinants of well-being can make an important contribution to developing an evidence base for planning, economic, environmental, and social policy. However, there are a number of problems with the current data:

The results on the determinants of happiness that we have presented are based on cross-section data (at one point in time). This does not allow the dynamics of happiness to be assessed, neither does it allow the direction of causation between the dependent and independent variables in question to be established, i.e. does marriage cause happiness or do happy people get married, does unemployment cause unhappiness or are unhappy people more likely to be unemployed.

Recent literature on the economics of happiness (Easterlin, 2006) has presented evidence that happiness is a dynamic process, changing throughout the life course, in response to changes in socio-economic and demographic conditions in the individual's life. Additionally, commentators in the psychology literature, such as Nobel Laureate Daniel Kahneman, have called for national well-being indicators to be developed to track well-being across regions, across time and across cohorts. These well-being measures would complement the traditional economic indicators to give a more holistic picture of how social indicators, economic indicators, environmental amenities and subjective well-being inter-relate. To facilitate these objectives in an Irish context would require the collection of data sets over time (panel data) where surveys are carried out year on year. Longitudinal cohort studies, where the same individuals are tracked over time and changes in SWB can be monitored and assessed and causation determined, are urgently required to further our understanding of happiness. The cost of a 5-year study would be in the region of €1 to 2 million. This is small change when compared with what we would learn about how to improve people's lives and how this can be used to set policy. The Government should, as a matter of urgency, invest in furthering this research so as to improve the evidence-base for policymaking.

New research in the literature is examining how individuals feel in the course of daily events. This new approach to examining subjective well-being, called the Day Reconstruction Method (Kahneman *et al.*, 2004), asks individuals how they feel as they engage in different activities throughout the day. The results assess the influences of the different life domains, including family life, employment, leisure, religion and social interaction. Findings include that people feel happiest in the company of others, and least happy commuting to work. Research of this standard is required in an Irish context to answer questions relating to how individuals feel throughout the normal day and are regional (urban/rural) differences present. Combined with the existing research, this could be used to assess how day-to-day living affects life as a whole.

Our analysis shows that environmental amenities directly affect well-being including drinking water quality, access to green space, and location of waste facilities. Tracking the dynamics of the environment and environmental concern would facilitate analysis of how these trends develop over time and across regions. In practice however, it is difficult to compile a comprehensive set of environmental indicators according to which regions can be compared. Moreover, some of the spatial factors which have an impact on life satisfaction operate at a small scale. Even within the same city different individuals may experience very different environmental and urban amenities. The use of Geographic Information Systems (GIS) offers great potential to overcome these difficulties and is currently being used for this purpose by these authors. Nevertheless, the reliability and richness of the results relies heavily on the quality of data available. Data on most aspects of environmental performance in Ireland are rather poor. There is a need for a significant investment in improving data collection and dissemination in this regard.

Conclusion

In practice, governments aim to advance quality of life by providing services such as employment, health and security that can be measured with objective indices. However, a principal tenet of free market economies is that quality of life can be also achieved by providing people with “capabilities”, e.g. the ability to find remunerative employment (through a thriving economy, free choice and adequate education). However, problems arise with public goods, such as the environment and social capital. For these, governments need convincing of their worth in the absence of an obvious return on investment and so we need to understand what we are doing to our environment and whether any destruction of environmental assets is being offset by investments in other forms of capital. The Genuine Savings Approach provides an important performance measure in this regard. Likewise, the Irish government is currently concerned with maintaining social capital, although there is uncertainty over its relationship with quality of life and over what social infrastructure requires most investment. The subjective well-being approach that we have presented provides a methodology for setting priorities for economic, environmental and social policy.

Nevertheless, the prevailing culture of individual choice means that investment in environmental or social capital may provide less obvious political reward. Ultimately, though, growing inequalities, diminishing of social capital and/or natural resources, or the “paradox of affluence”, may *force* governments to explore alternative means of advancing quality of life. It would be far preferable if the Irish Government acted now on investing in the development of these measures rather than being forced to do so in the future.

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