Rabobank

It's more than the economy, stupid!
It's all about well-being

November 2011

Economic Research Department

Content

Introduction

It's more than the economy, stupid!

Traditionally, Gross Domestic Product (GDP) has been used for designing and assessing policies aiming at advancing the progress of society. The use of GDP as a measure of progress is based on the conviction that people are better off when more growth is realized. In economics it is generally assumed that individuals derive well-being from the satisfaction of their needs according to their preferences. Many of these needs can be fulfilled by the consumption of goods and services. In general available resources will be insufficient to satisfy one's individual needs. As a consequence some needs may be either only partially satisfied or not satisfied at all. If GDP per capita increases people will, on average, have a higher income and are assumed to be more able to satisfy their needs.

Therefore, it may not come as a surprise that many governments strive for higher and higher GDP levels and not without success. While more and more countries move from a situation of scarcity to a situation of plenty, the improvements in GDP do not yield to the same improvements in well-being. This observation is caused by the fact that the concepts of growth and development are not necessarily the same. *"To grow means to increase naturally in size through the addition of material through assimilation or accreditation. To develop means to expand or realize the potentialities of bringing gradually to a fuller, greater or better state. In short, growth is the quantitative increase in physical scale while development is qualitative improvement or unfolding of potentiality. An economy can grow without developing, or develop without growing, or do both, or neither"* (Daly, 1977).

GDP was never intended to measure well-being. Kuznets (1934), architect of GDP, already mentioned that: *"The welfare of a nation can scarcely be inferred from a measurement of national income as defined by the GDP*". The United Nations reaffirmed this notion very recently in a non-binding resolution on happiness. They mention that *"GDP was not designed to and does not adequately reflect the happiness and the well-being of people in a country"* (UN, 2011). GDP is only a measure of economic performance and does not measure accurately whether our lives are improving in both material and immaterial terms.

In the last couple of decades the use of GDP as a measure of well-being increasingly has come under fire.[1] In the calculation of GDP no distinction is made between costs and benefits, productive and destructive activities and sustainable and unsustainable activities. It is assumed that all monetary transactions boost the well-being of people, while this is clearly not the case. Therefore policy decisions based upon GDP may be distorted and governments should not use GDP as a yardstick. Instead, governments should *"pursue the elaboration of additional measures that better capture the importance of happiness and well-being in development with a view to guiding their public policies"* (UN, 2011).

[1] See also: Van de Belt, R. (2011). Moet Nederland Bhutan achterna? Themabericht 2011/10, Rabobank Nederland.

Introduction

The subjective well-being of people is an objective condition worth optimizing. Not only is well-being valued by everyone in society, but it can also be maximized regardless a person's socioeconomic background. The study of subjective well-being can make clear to policymakers how and by how much policy decisions affect self-reported well-being. Moreover, it may (partly) unclutter why people behave the way they do. Although utility models that are currently used in economics shed light on the incentives that lead people to pursue needs and desires, these models are far from realistic (Frey and Stutzer 2002). Right now, the study of subjective well-being is still in its infancy and the prospects for the field of economics are not fully crystallized. Continued research in this field is therefore necessary.

Many alternative well-being measures have been developed in the recent past. These alternative indicators all take one or more of the following dimensions into account: material living standards, health, education, personal activities including work, political voice and governance, social connections and relationships, present and future environmental conditions and insecurity of an economic as well physical nature (Stiglitz et al, 2009). In this Special we will evaluate how well subjective well-being, as measured in the waves of the World Values and European Values Surveys, is explained by the dimensions mentioned above. In particular, we will attempt to compare how much GDP and the dimensions mentioned by Stiglitz et al (2009) contribute to explaining the cross-national differences in reported levels of life satisfaction. For this purpose we will build an ordered probit model.

This Special is organized as follows. First, we will describe the concept of well-being and the shortcomings of GDP as a measure of it. Subsequently we will look at several alternative measures that have been developed in the past. Thereafter, the data are discussed. As was already mentioned, the concept of well-being can be operationalized based on eight dimensions. We will discuss why each of the domains is important and make a relevant selection of variables within each domain. Then we will present the regression results and undertake a robustness check. Finally, conclusions are drawn.

Ruth van de Belt
R.Belt@rn.rabobank.nl

Shortcomings of GDP

GDP is a flawed measure of well-being

We would like to investigate how much the dimensions mentioned by Stiglitz et al (2009) contribute to explaining the cross-national differences in reported levels of subjective well-being. But before we can turn to this, it is important to understand the concept of well-being and the ways in which it can be measured. Over the years well-being has been equated with per capita GDP. However, per capita GDP is not an unassailable measure of well-being and many economists have criticized its use. Insights in these deficiencies have led to a quest for alternative indicators that capture well-being in a better way.

Definitions and measurement of well-being

According to the UN (2011) *"the pursuit of happiness is a fundamental human goal"* and well-being should be a notion that policymakers aspire to improve. But without a clear definition, policymakers are not able to undertake steps that give more importance to the pursuit of well-being. Despite the fact that a great body of literature is devoted to the clarification of the concept of well-being, a clear definition is still lacking. McGillivray and Clarke (2006) mention that *"quality of life, welfare, well-living, living standards, utility, life satisfaction, prosperity, needs fulfilment, development, empowerment, capability expansion, human development, poverty, human poverty, land and, more recently, happiness are often used interchangeable with well-being without explicit discussion as to their distinctiveness"*. According to Veenhoven (2007) well-being means *"that something is in a good state"*. However, it is unclear what exactly should be in a good state and what is considered good.

Although the concept of well-being is not entirely clear, two general remarks can be made. First, it is important to make a distinction between current and future well-being (Stiglitz et al, 2009). The current well-being of people depends on both the economic and non-economic aspects of peoples' lives. Whether future generations are as well off as the current ones, depends on the fact whether the current level of well-being can last over time. Well-being is only sustainable if the current stocks of natural, physical, human an social capital are passed on to future generations. Second, well-being is a multidimensional concept. Based on academic research Stiglitz et al (2009) identified the following eight dimensions: material living standards, health, education, personal activities, political voice and governance, social connections and relationships, present and future environmental conditions and insecurity of an economic as well physical nature.

In the measurement of well-being an objective and/or subjective approach can be taken. Objective measures make use of certain observable facts and can be classified in two categories, namely resource related and consumption related measures (Paim, 1995). Resource related measures are based on a critical level of income from which economic well-being is inferred. Current income is often used, but the earning potential of people forms a good alternative. Garfinkel and Haveman (1977) even claim that the latter is a better indicator of economic

well-being than the former. In addition also the current net worth of people could be taken into account (Weisbrod and Hansen, 1977), or one could look at the debt-asset ratio (Marlowe and Goodwin, 1988). Consumption related measures focus on the access of individuals to certain goods and services. These measures can also take many forms, including nutrient intake, health status and educational achievement. Magrabi et al (1991) claim that the use of consumption related measures of well-being should be preferred above income related measures, because they are more reliable. Consumption not only correlates better with permanent income, it also comes much closer to the satisfaction of needs than income (Paim, 1995).

Objective measures are constructed in a rather mechanical way and may therefore not be a good representation of the state of well-being of individuals. In contrast, subjective measures take people's feelings and real experiences into account.[2] According to Easterlin (2004) both happiness and life satisfaction are used interchangeably as measures of subjective well-being. Veenhoven (1997) states that *"the word life satisfaction denotes the same meaning … as happiness"*. But Bruni en Porta (2007) mention that although both are components of subjective well-being, these two components reflect different things.[3] Life satisfaction reveals how much an individual is away from his aspirations, while happiness is the outcome of a balance between positive and negative affect. Moreover, happiness turns out to reflect the evaluation of well-being in the short run, whereas life satisfaction appears to measure longer-term more stable evaluations (Helliwell and Putman, 2004).

Limitations of GDP as a measure of well-being

Per capita GDP is often used as an objective proxy for well-being. According to standard economic theory a higher GDP level means that people can spend more money, consume more[4] and attain a higher well-being level. Squire (1991) postulates that this is the case, because many components of well-being can be bought in the market. However, per capita GDP is a futile measure of well-being. There exists a quite extensive theoretical and empirical literature in which the shortcomings of per capita GDP are described. See for example, Kuznets (1941),

[2] Economist have been very sceptical about subjective well-being measures, because they thought that the answers to the questions asked may not correspond to what researchers intended to measure. However, there is proof for a link between answers given to subjective well-being questions and between subjective and more objective measures of personal well-being (Diener, 1984; Diener et al., 2006; Kahneman and Krueger, 2006).

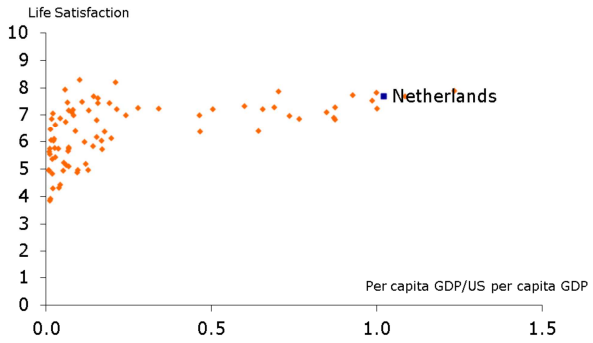
[3] Di Tella et al (2001) find a correlation coefficient of 0.56 between happiness and life satisfaction.

[4] It is very hard to determine what the exact relationship between consumption and well-being is (Magrabi et al, 1991). Some claim that well-being is a direct function of consumption, while others think that it is a function of the gap between the actual and the desired consumption level (the bigger the gap, the lower the well-being). Well-being may also be a function of the gap between current and past consumption level (positive gap implies higher well-being) or a function of the balance among the consumption categories (a more balanced pattern generates more well-being).

Shortcomings of GDP

Nordhaus and Tobin (1972), Hueting (1974), Hirsch (1976), Sen (1976), Daly (1977) and Tinbergen and Hueting (1992). In order to get an idea of the limitations of GDP, we will describe the main arguments. However, one should note that the list of arguments presented is surely non-exhaustive. Moreover, although the interpretation of GDP per head of the population as a well-being measure is often criticized, it is, as we will see, not completely useless.

Figure 1: Relationship between per capita GDP and life satisfaction



Source: World Values Survey

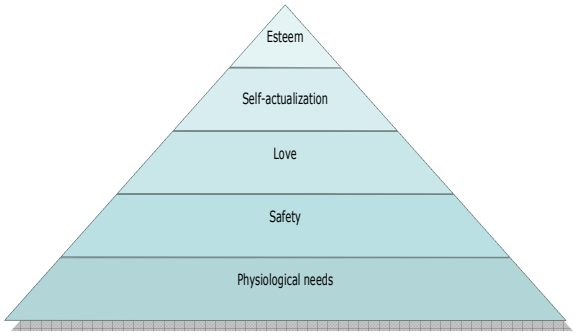
Classical economists, such as Adam Smith, Bernard de Mandeville and Jeremy Bentham studied happiness, which was later replaced by utility in economic literature. When empirics and macro econometric models became more important in economics this utility was monetized and GDP became the main proxy for well-being. GDP is the central measure in the System of National Accounts (SNA) which was first published by the United Nations (UN) in 1953 in order to enable comparisons of economic activity across countries. A positive change in per capita GDP is often equated to a progress in well-being, but a thorough theory is lacking. Therefore it may not come as a surprise that its use as a well-being measure is often criticized.

The correlation between GDP growth and increases in well-being is not highly positive (figure 1). Although in certain periods or regions a positive correlation is found, this is not the case for all periods in all regions. While GDP can grow and grow, the well-being of individuals cannot become infinitely high. Somewhere a delinking must take place. Past growth experiences have shown that this is indeed the case. Until the 1950s a strong positive correlation between (subjective) well-being and GDP levels was present for most OECD countries. However, somewhere in between 1950 and 1970 the increase in well-being stagnated in most western countries despite a steady pace of GDP growth (Blancheflower and Oswald, 2004). Max-Neef (1995) refers to this phenomenon as the threshold hypothesis: *"For every society there seems to be a period in which economic growth (as conventionally measured) brings about an improvement in the quality of life, but only to a point-the threshold point-beyond which, if there is more economic growth, quality of life may begin to deteriorate".* Helliwell (2003) estimates that the threshold point lays around a per capita GDP of 15.000 USD. This may imply that GDP per head of the population is a less good predictor for rich countries than for poor countries.

The existence of such a conditional relationship can be explained by a diminishing marginal utility of income. If income becomes higher and higher, people are less able to transform the higher income in higher living standards. Essentially Maslow's hierarchy of needs plays a role here (Mashlow, 1943).

According to this hierarchy an individual must first satisfy his physiological needs (health, food, sleep et cetera) before he can move on to higher levels of needs, including safety (shelter, removal from danger et cetera), love, esteem (self-esteem and esteem for others) and self-actualization (figure 2). In meeting the physiological needs income plays an important role, but in order to satisfy the "higher" needs income matters less.

Figure 2: Mashlow's Pyramid



Source: Mashlow (1943)

Now we will give an overview of the main critiques. First, GDP does not take all production into account. According to the UNSNA 2008 economic production is defined as: *"…an activity carried out under the control and responsibility of an institutional unit*[5] *that uses inputs of labour, capital, and goods and services to produce output of goods and services. There must be an institutional unit that assumes responsibility for the process and owns any goods produced or is entitled to be paid, or otherwise compensated, for the services provided".* But not all economic production is included in the GDP measure. Only *"a) The production of all individual or collective goods or services that are supplied to units other than their producers, or intended to be supplied, including the production of goods or services used up in the process of producing such goods and services; b) The own-account production of all goods and services that are retained by their producers for their own final consumption or gross capital formation; and, c) The own-account production of housing services by own-occupiers and of domestic and personal services produced by employing paid domestic staff"* should be incorporated and be valued at their market price. This definition makes clear that own-account production of housing services and domestic and personal services by members of the household is not taken into account. This is the case, because these informal services are hard to value since an adequate pricing system is lacking. Furthermore, the impact of these activities on the economy is assumed to be limited. However, the impact on well-being may not be limited at all. Domestic work, caring for children, the elderly and the ill at home, subsistence farming and voluntary work are very valuable for society. Without these activities a lot of people would be worse off. If some of the informal activities were to be paid, GDP will increase but people will not be better off. After all, the services already took place. Policy makers should therefore not aim at cutting back and discouraging informal activities. While such a policy will generate economic growth, it will not enhance the well-being of people. Also a lot of non-economic factors that are well-being enhancing are excluded in the GDP measure. Leisure is, for example,

[5] Market and non-market producers.

not valued. The GDP level will increase when people start working (more), but those people can spend less time with their family, friends and on other activities and this may have a negative impact on their well-being. In healthy proportions, free time can be said to contribute to people's well-being. Another non-economic factor that is excluded is the quality of the environment in which people live. Economic production often has negative environmental consequences in the form of air, water and noise pollution, but these consequences are disregarded in the calculation of GDP. More production generates GDP growth, but because of the environmental damages it may not increase the well-being of people.

Second, in the calculation of GDP the principles of proper accounting are not satisfied (Bergh, 2007). No distinction is made between costs and benefits. Cobb et al (1995b) describe this quite striking. They mention that *"by the curious standard of GDP, the nation's economic hero is a terminal cancer patient that is going through a costly divorce",* because the money that is spend on medical care and the divorce have a positive effect on GDP. However, these expenses will not have a positive impact on the well-being of the "economic hero". Cobb et al (1995b) also mention that *"the happiest event is an earthquake or a hurricane",* since the reconstruction efforts will boost GDP. However, the money spend will not lead to additions in well-being, because something is simply replaced that was already there. The same argument holds for the replacement of depreciated capital. The replacement costs are included in GDP, but the economy is just taken back to square one and such expenses will not be welfare enhancing. These examples show that adding all transactions is a rather strange thing to do. According to Stiglitz (2005) *"No one would look at just a firm's revenues to assess how well it was doing. Far more relevant is the balance sheet, which shows assets and liabilities. That is also true for a country."* GDP is also not corrected for changes in stocks and resource supplies and therefore changes in the underlying capital, such as non-renewable resources, may be overlooked for a long time and we think that we are richer than we really are (Atkinson et al, 1997). As a consequence consumption may be increased beyond a sustainable level and future economic growth is jeopardized in order to realize current growth. Moreover, in the calculation of GDP many public goods, such as the army and police, are valued at their costs. However, the fair value of these public goods for society may be higher. This implies that the GDP measure underestimates the importance of these goods for humanity. Furthermore, the GDP indicator does not take into account the social cost of goods and services that may arise because of market failures such as imperfect competition and externalities. Only the private costs are accounted for.

A further difficulty with using GDP per capita as a measure of well-being is that it emphasizes average income, but the income shares are usually unequally distributed in society and this implies that a rising tide does not lift all boats (Sen, 1976; Sen, 1979). This becomes painfully clear when one looks at the growth

experiences of many developing countries in the 1950s and 1960s. Most of these countries reached their growth targets, but only the people with the highest income shares profited while the living standards of the masses of people remained almost the same. As was already mentioned the marginal utility of income is diminishing and as a consequence an income rise for the wealthiest income brackets counts less towards improving overall material well-being than an income rise for the poorest income brackets (Lawn, 2005). An unequal income distribution may therefore be detrimental for well-being. Moreover, per capita GDP does not distinguish between the expenditures of the poor and rich. In fact, expenditures by the rich even receive a higher weight, because poor people will generally buy cheap goods, while the rich spend a significant amount of their income on expensive luxury goods. Additionally, GDP per head of the population does also not take relative income aspects into account. People want to keep up with the Jones's. Thus consumption decisions are not only driven by basic needs, but also by imitation and a search for status. In this light it seems logical that people strive at higher and higher income levels. However, if others aim at the same goal this behaviour will not necessarily lead to a situation in which one is better off.

Proposed alternative objective measures for well-being

The insight that per capita GDP is a dubious yardstick of well-being, has led to a quest for alternative indicators that capture well-being in a better way. Numerous alternative indicators have been developed in the past. In order to get an idea about the factors that are considered to be important for well-being, we will discuss a few of the alternative measures below.

Nordhaus and Tobin (1972) were one of the first to question the usefulness of GDP as a well-being measure. They argue that a production view is taken rather than a consumption view, while consumption is the ultimate goal of economic activity. They constructed the Measure of Economic Welfare (MEW). Although the MEW is rather *"primitive and experimental",* it is still worth mentioning because a lot of other measures are based upon it. The GNP measure forms a starting point and is subsequently adjusted in three ways. First, they subtract disamenity costs of urbanization. Usually urban residents earn more that rural labourers, but part of this difference may be a compensation for negative externalities, such as congestion and pollution, that those residents in urban areas experience. Second, they subtract several regrettable necessities, such as police expenses needed to combat crime. Finally, they add monetary estimates for a number of activities that contribute positively to well-being, such as nonmarket activities and leisure.

Daly and Cobb (1989) developed the Index of Sustainable Economic Welfare (ISEW). The ISEW takes personal consumption expenditure as point of departure, but weights it with an index of distributional income inequality to correct for diminishing returns of income. Subsequently, they make several further

adjustments. They add a number of welfare relevant contributions, such as the value of services from domestic labour and non-defensive health and educational expenditures[6]. Some items which relate negatively to the well-being of people are subtracted, such as the costs of environmental degradation, changes in the underlying environmental capital stock and defensive expenditures. The Genuine Progress Indicator (GPI) proposed by Cobb, Halstead and Rowe (1995a) forms a refinement of the ISEW. They also correct personal consumption expenditure for the inequality in the income and wealth distribution. Next, they factor the value of household work and volunteer work in, while the cost of crime, environmental degradation, family breakdown, stress and exploding consumer debt are subtracted.

One of the most well-known measures replacing GDP is the Human Development Index (HDI). According to the United Nations Development Program (UNDP, 1990) the most important aspects of human development are that people can enjoy a decent standard of living and that they are endowed with human capital in terms of good health and education. Therefore the HDI combines indices on these three dimensions into a single index (UNDP, 2010). In 2010 the UNDP has adjusted the HDI in three ways to capture inequalities in distribution of each of the three dimensions. The Gross National Happiness (GNH) Index also includes information on several other well-being aspects, such as the psychological well-being of people, their time use, community vitality, culture, environmental diversity and governance (Centre for Bhutan Studies, 2011). Another example of an indicator that takes multiple well-being dimensions into account, is the Sustainable Development Indicator (SDI). This measure is based on numerous subindicators that belong to one of the following ten themes: socio-economic development, sustainable consumption and production, social inclusion, demographic changes, public health, climate change and energy, sustainable transport, natural resources, global partnership and good governance (Eurostat, 2005).

Also some indicators have been developed that supplement GDP based on national account systems. For example, in order to complement the collection of conventional data, the UN proposed in 1993 that countries should set up satellite accounts to take account of several environmental and social factors. Other satellite accounts have been introduced since then.

[6] Defensive expenditures are expenditures that must be done in order to deal with the effects of other spending, such as health expenditures that are needed to combat the health consequences of smoking or pollution.

Data description

Overview of well-being dimensions

Potentially a lot of factors lead an individual to give a high or low response to the life satisfaction question. The alternative well-being measures described above take a wide range of indicators into account. Based on academic research Stiglitz et al (2009) concluded that the following eight dimensions matter most for well-being: material living standards, health, education, personal activities including work, political voice and governance, social connections and relationships, present and future environmental conditions and insecurity of an economic as well physical nature. These dimensions will be discussed below.

Figure 3: Subjective well-being

Source: World Values Survey

Data description

This Special uses data from the World Values Survey (WVS) and European Values Survey (EVS). In these surveys people are asked about their values and beliefs about all major areas of human concerns, such as religion, politics, economics and social life. The WVS builds on the EVS first carried out in 1981 in 14 countries in Western Europe. New waves of the survey were conducted in the periods 1989-1993, 1994-1998, 1999-2004 and 2005-2008. For practical reasons we will only make use of the last two survey waves which obtained responses from 144.081 respondents in 74 different countries all over the world. The macroeconomic data that are used in this Special are taken from the World Bank database.

Subjective well-being

We would like to evaluate how well subjective well-being is explained by the dimensions proposed by Stiglitz et al (2009). As was already mentioned, subjective well-being can be measured by asking people to judge their live in terms of life satisfaction or happiness. Since life satisfaction appears to measure longer-term more stable evaluations, we have chosen to use the self-reported life satisfaction as well-being measure. In the WVS respondents were asked the following question: *"All things considered, how satisfied are you with your life as a whole these days?"* They could rate their life satisfaction on a 10-point scale, were a 1 indicated that they were dissatisfied and a 10 indicated that they were satisfied. The distribution of the responses is skewed to the left and has a low degree of peakedness (figure 3).[7] Because of the non-normal distribution and the categorical nature of the dependent variable, the use of a linear regression model to explain life satisfaction may be problematic. Therefore, we will employ an ordered response model.

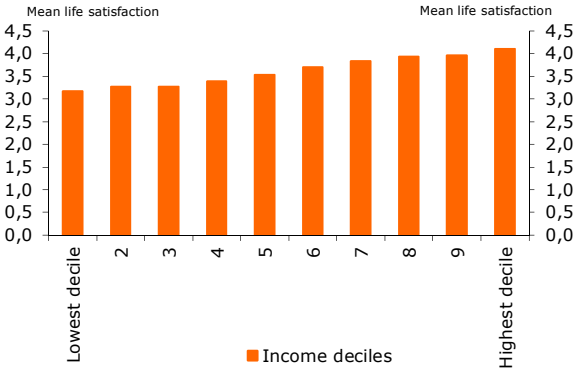
[7] The skewness equals -0.45 indicating that the tail on the left side is longer than the tail.

Data description

Living standards

According to the Universal Declaration of Human Rights (UDHR) *"Everyone has the right to a standard of living adequate for the health and well-being of himself and his family"*. Living standards are adequate for an individual if he lives above the poverty line of the society concerned. That is, the individual must be able to buy adequate food, clothing and housing and be able to participate in the everyday life. However, it is difficult to determine whether living standards are adequate or not, because this depends on a lot of factors. Among other things ownership of productive assets (land, labour et cetera), capacity to work and access to credit and insurance markets plays a role. Given the fact that data on a lot of these variables are scarce, we will use several income variables as proxies for the standards of living. Per capita GDP is often used as an income indicator, but the UNDP (1990) argues that per capita GNI (constant prices, PPP) is a better substitute, because per capita GNI measures the income that is accrued to the residents of a country. As was already mentioned in the previous chapter, the marginal utility of income is diminishing for this reason we have included the logarithm of per capita GDP (income_lgdp) and GNI (income_lgni) in our dataset. We have also included the individual income scale (income_scale) in our dataset, because Easterlin (1974) showed that within the same country people with a higher income tend to be happier than people with a lower income. For each country the income scale is divided into deciles and respondents are asked to indicate in which category their income level falls (figure 4). Finally, we have added information on a person's satisfaction with the financial situation of the household (income_satfinancial). People who are more satisfied with their financial situation may also be more satisfied with their lives (figure 5). Since people with a higher income scale may also be more satisfied with their financial situation, we have decided not to include both variables in the same model.

Figure 4: Income decile and life satisfaction



Source: World Values Survey

Figure 5: Satisfaction with financial situation and life satisfaction

Source: World Values Survey

Data description

Health

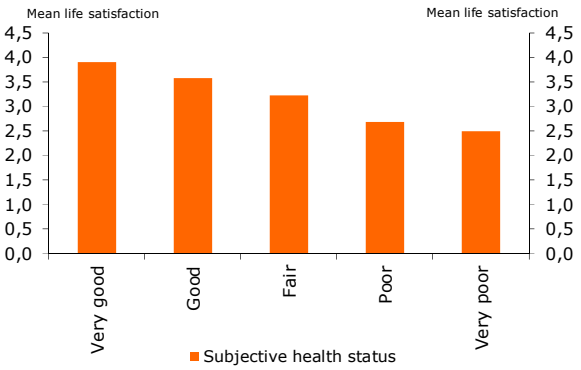
Health can be defined as *"a state of complete physical, mental and social well-being"* (World Health Organization, WHO, 1946). A good health strengthens a person's human development (figure 6). In evaluating a person's health status both mortality and morbidity are important, because changes in the number of deaths may not go hand in hand with changes in the number of individuals in a poor health (Riley, 1997). Unfortunately little information about morbidity is available. The WVS and EVS only contain information on the subjective health status of respondents (health_subjective). We have decided to include this information in our dataset, because the correlation between objective and subjective assessments of personal health is high (Wu and Schimmele, 2006; Revicki and Mitchell, 1990; Bishop et al, 1986; Ostir et al, 2001; Strandberg et al, 2006). The subjective health is in large part determined by objective physical health conditions of a chronic nature (Hoeymans et al, 1997; Goldstein et al, 1984; Johnson and Wolinsky, 1993; Kempen et al, 1997; Kim et al, 1997; Moum, 1992 and Mulrow et al, 1994) and forms a good proxy for the actual health status of an individual. The self-reported health status can take a value between 1 and 5, were 1 indicates that the state of health is very poor and 5 indicates that the state of health is very good.[8]

Education

According to the UDHR *"Everyone has the right to education"*. It enhances people human capital, i.e. *"the knowledge, skills, competencies and attributes embodied in individuals"* (OECD, 2001), and contributes to an individual's well-being (figure 7). Education generates economic benefits in the form of employment and higher labour market earning (Krueger and Lindahl, 1999) and leads

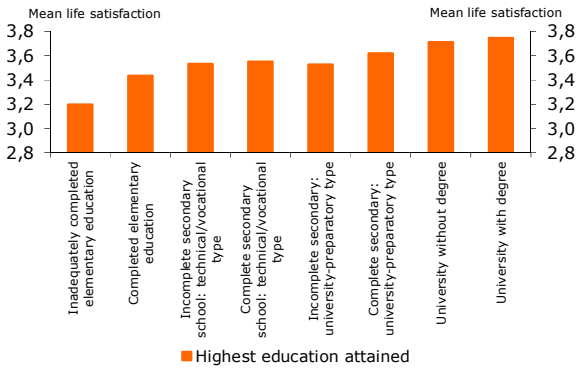
[8] We have recoded the original answers that were given in the WVS and EVS. A 1 indicated originally that the state of health was very good, whereas a 5 indicated that the state of health was very poor.

Figure 6: Subjective health status and life satisfaction



Source: World Values Survey

Figure 7: Education and life satisfaction



Source: World Values Survey

to non-economic returns, such as a better health (Mackenbach, 2006). Educated people suffer less from serious and common health problems (Stone et al, 2008), are less likely to smoke and drink heavily (Wolfe and Haveman, 2001), and to suffer from obesity (Kenkel, 1991).[9] Besides these personal returns, education also generates economic benefits for society. If the number of well-educated people goes up, labour productivity will increase as well and the society will be more able to absorb advanced technologies (Acemoglu, 2009). Moreover, the initial level of education correlates positively with economic growth (Barro, 1991; Benhabib and Spiegel, 1994.[10] The non-economic benefits from education for society consist of increased active participation and a higher political[10] (Milligan et al, 2004; Dee, 2004) and social engagement (Verba et al, 1995; Schuller et al, 2000; Bynner et al, 2001). Furthermore, it leads to higher levels of trust (Helliwell and Putman, 1999), tolerance of diversity, commitment to equality of opportunities and resistance to anti-social behaviour such as crime (Wolfe and Haveman, 2001). The positive relationship between education and well-being is reaffirmed by subjective well-being studies (Blancheflower and Oswald, 2000; Putman, 2000). Skills and competences are often proxied by educational credentials (OECD, 2001) and we will also make use of the educational level in our analysis.[12] The WVS and EVS databases contain data about whether respondents had formal education or not (edu_formal) and what the highest attained educational level is (edu_highest).

Personal activities

People daily engage in all kinds of personal activities of which some are well-being enhancing and others are not. On a global level these daily activities can be divided into three categories: paid work, leisure and personal care (drinking eating, sleeping, et cetera). The impact of paid work on well-being may go either way. Having a paid job for a restricted number of hours per week may enhance a person's well-being (Glass and Fujimoto, 1994; Repetti et al, 1989), because it provides an income and a certain standard of living as well as personal dignity and social interaction. However, working to much may or working non-standard hours may be harmful for one's health and impact well-being negatively (Benach en Muntaler, 2007; Kodz et al, 2003; Perry-Jenkins et al, 2007; Jamal, 2004). This is especially true if the work is repetitive or the work conditions are hazardous. The exact relationship between paid work and well-being depends strongly

[9] This is not only a consequence of a higher income, but also of the fact that more educated people adopt healthier life styles, are less exposed to occupational hazards and live in less polluted areas (Kenkel, 1991).

[10] However, the relationship between education growth and positive changes in economic activity is less clear (Benhabib and Spiegel, 1994; Kreuger and Lindahl, 2001 and Temple, 2001).

[11] This is especially true for the United States. In the European Union a causal link between education and political engagement is lacking (Milligan et al, 2004; Siedler, 2007; Touya, 2006).

[12] It is important to note that the measures used do not say anything about the quality of education. This may be a problem, especially in developing countries.

on the quality of the job, where quality refers to specific characteristics of the job. Work should be decent. According to the ILO (2011) *"decent work involves opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men"*. Yet there is no agreement on decent work indicators and the last two survey waves of the WVS and EVS do not contain any information on the quality of work. However, information on the employment status of respondents is available. Based on this information, we have constructed five dummy variables (work_emp, work_unemp, work_retired, work_house, work_student). These dummy variables take value 1 if the respondent is employed, unemployed, retired, is a housewife or in school respectively and zero otherwise.

Leisure is also essential for people's well-being (Caldwell, 2005; Mannell, 2007). Physical leisure activities mainly contribute to the physical well-being of people (Warburton et al, 2006), while social leisure activities have a greater impact on social well-being (Cattell et al, 2008). Moreover, leisure activities have a different impact on different groups in society, such as lower income groups (Campagna et al., 2002; Totten, 2007), children and elderly (Murphy & Carbone, 2008; Zoernick, 2001), and minority groups (Henderson & Ainsworth, 2002). Based on time use surveys we know how much time people spent on leisure activities, but knowing this is not enough. To determine the amount of well-being people derive from leisure activities, we must know how much importance people attach to these activities and the amount of satisfaction they derive from it (Di Bona, 2000; Lloyd & Auld, 2002; Nimrod, 2007). Therefore, we have included the importance people attach to leisure activities in our dataset.

People also spend a lot of time on household work, childcare and doing groceries. As was already mentioned in the previous chapter, these activities can have a significant impact on people's well-being. Again it is better to take the importance that people attach to these activities into account than measures based on participation in activities or the use of various resources. Unfortunately, data on unpaid domestic work are not available and we will not be able to take unpaid domestic work into account.

Governance

Governance can be defined as *"the traditions and institutions by which authority in a country is exercised. This includes (a) the process by which governments are selected, monitored and replaced (b) the capacity of the government to effectively formulate and implement sound policies and (c) the respect of citizens and the state for institutions that govern economic and social interactions among them"* (Kaufman et al, 2010). Good governance will lead to a higher

average level of life satisfaction (Helliwell and Huang, 2008; Ott, 2010; Ott, 2011).
The Worldwide Governance Indicators research project accesses the quality of governance by six factors. The first factor that is important for good governance is *"voice and accountability"*. People should be able to choose their government representatives and have press freedom and freedom of expression and association. *"Political stability and absence of violence"*, i.e. a low probability of a coup d'état, is also an essential aspect of good governance. Another essential factor is *"government effectiveness"* capturing the values people attach to the quality of public and civil service and the extent to which politicians can influence this. A fourth factor that is important is *"regulatory quality"*. That is, people's judgement about the quality of the formulation and implementation of public policy that allows and stimulates private sector development. *"Rule of law"* also matters for good governance. Citizens should respect the rules that are laid down by the government and have confidence in law enforcement. Finally, *"control of corruption"* is a significant factor to judge the quality of governance (Kaufman et al, 2010).[13]

The Worldwide Governance Indicators are not available for the whole sample period. Therefore, we will not be able to use these indicators. Luckily, some data on governance are collected in the WVS and EVS. Respondents are, for example, asked to rate the way in which the democracy is developing (govern_satdemocracy) and to rate the human rights situation in their country (govern_humanrights). Respondents are also asked about the level of confidence they have in the press (conf_press), police (conf_police), civil services (conf_civil), government (conf_government), parliament (conf_parliament) and political parties (conf_parties). We have included all these variables in our dataset.

Social connections

Social capital has a positive effect on the well-being of individuals and society as a whole.[14] Social capital in the form of trust makes transactions between individuals, firms and nations possible and lowers transaction costs. Social capital also generates personal non-economic benefits. For example, there exists a correlation between social capital and the likelihood of finding employment (Barbieri et al, 1999), the health status of an individual and subjective well-being (Putman, 2000). Besides these personal advances, a higher social capital may also

[13] According to Helliwell and Huang (2008) those six indicators are not equally important for countries. They note that the relative importance depends on the development stage of a country: for rich countries the latter four indicators are more important, while the first two matter for poor countries.
[14] Social connections do not only have value for the people who are in the network, but also for the people who are outsiders. These externalities are typically positive (Helliwell, 2001; Powdthavee, 2008). This implies that social connectedness generally increases both the well-being of the in- and outsiders.

generates macro-economic benefits in the form of economic growth[15], more investment in human capital (Coleman, 1988), higher levels of financial development (Guiso et al., 2004) and more innovation (Akcomak and ter Weel, 2009). Moreover, the incidence of crime is also lower when social capital is higher (Rosenfeld et al., 2001; Buonanno et al., 2009; Akcomak and ter Weel, 2009). Social capital is often seen as an asset and therefore its presence is measured. However, there is no consensus on the measurement method. Trust, civic involvement and altruism may be important (CPB, 2008). Since it is understood that a higher level of trust leads to higher level of social capital (Putman, 1995; Knack and Keefer, 1997; Messner et al., 2004), we will include the trust people have in others, in people they know personally and in people they meet for the first time in our dataset (figure 8). Civic involvement may also have a positive impact on social capital and the voter turnout and participation in volunteer work are often used as proxies (Putnam, 1993; Rosenfeld et al., 2001; Gatti et al., 2003). The WVS and EVS only contain data on the latter (social_volunteer). Social capital is also higher when people care more for each other, but no information on the altruistic behaviour of people is available in the WVS and/or EVS.

Figure 8: Trust in others and life satisfaction

Source: World Values Survey

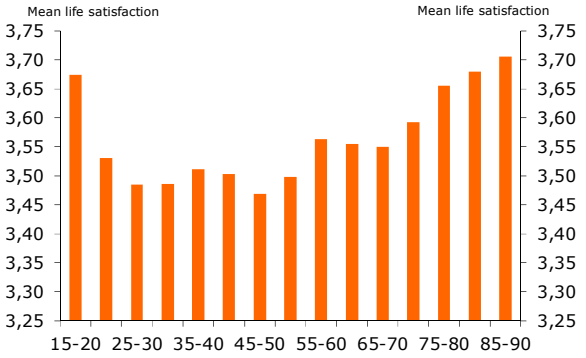
Environmental conditions

People have a tremendous impact on the environment, but the environment conditions also affect our well-being. Environmental conditions influence human health in a direct (for example air, water and noise pollution et cetera) and indirect (for example climate change, loss of biodiversity, natural disasters et cetera) way. The WHO (2008) estimates that approximately a quarter of the total burden of diseases in the world is due to environmental hazards. Environmental services, such as access to clean water and recreation areas, also impact the well-being of individuals. As does environmental insecurity which may be a consequence of climate change and the incidence of natural disasters. Regrettably,

[15] According to Knack and Keefer (1997) and Hjerrpe (1998) the relationship between interpersonal trust and economic growth is positive when other factors were controlled for. However, Helliwell (1996) found a negative correlation between trust and the economic activity in a country. The connection between national levels of group membership and economic growth is also ambiguous. Putman (1993) finds proof for a relationship, but Knack and Keefer (1997) do not find evidence. The inconclusiveness of the results may indicate that important aspects of social capital are not taken into account. Helliwell (2005) claims that trust is a catalyst of stronger social capital. If the trust is high, individuals are more likely to set up and participate in social networks and this will make people better off. Therefore, a variable that measures trust in others is included. This variable indicates whether individuals think that that most people can be trusted.

little information on the state of the environment is available. For this reason we will use per capita carbon dioxide emissions in metric tons as a proxy for the environmental conditions.

Figure 9: Age and life satisfaction



Source: World Values Survey

Insecurity

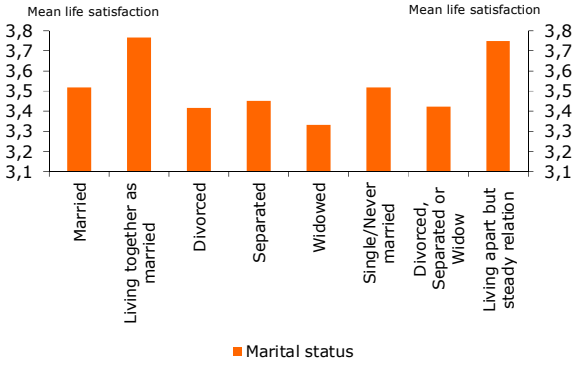
Insecurity has a negative impact on the well-being of (risk-averse) people, because it is a source of fears and anxieties and leads to uncertainty about the future. Two types of insecurity can be distinguished: personal and economic insecurity (Stiglitz et al, 2009). If external factors, such as natural disasters, put the physical integrity of people at risk, we speak of personal insecurity. Economic insecurity results from future material conditions being uncertain. This uncertainty arises, because there is a chance that people get unemployed, ill or old. Of course, the consequences of those uncertainties for well-being depend on a lot of factors, including the severity and the length of the shock, the disgrace associated with it and the risk attitude of the individual. The unemployment rate in a country is used as a proxy for economic insecurity, while no surrogate for personal insecurity is available.

Personal characteristics

We have also included a number of individual variables in our dataset, because past research has shown that there exists a relationship between individual characteristics and the reported level of life satisfaction. For example, a U-shaped relationship exists between life satisfaction and age (figure 9). People in their middle ages generally report lower levels of life satisfaction than people who are younger or older (Blanchflower, 2008; Bell and Blanchflower, 2007; Blanchflower and Oswald, 2004, 2007; Helliwell, 2003; Frey and Stutzer, 2002; Di Tella et al, 2001, 2003; Oswald, 1997; Clark, Oswald, and Warr 1996, Clark and Oswald, 1994). This U-shaped pattern may be caused by the fact that middle ages are often burdened with difficult decisions and have to think about their family instead of their selves. Other explanations for the prevailing shape are that individuals learn to adapt to their strengths and weaknesses when they age, that happier people may live longer than sad people (selection effect) and that people see their friends die and are happier with what they have at an old age (comparison effect). The marital status seems to matter too. In comparison with single people, marriage goes hand in hand with higher levels of life satisfaction for both men and women (figure 10). More over, persons who have been divorced, separated or widowed generally report a lower level of satisfaction with life (Clark and Oswald 1994; Blancheflower and Oswald, 2000; Clark, Georgellis,

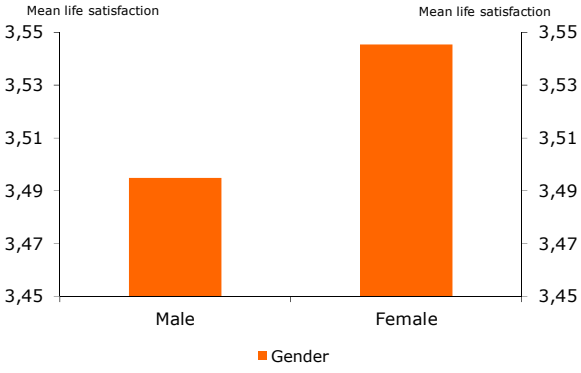
and Sanfey 2001; Gerlach and Stephan 1998; Theodossiou 1998; Winkelmann and Winkelmann 1998; Helliwell, 2003). Frey and Stustzer (2002) explain this by the fact that marriages boost the self-esteem of people and leads to support and companionship, while a divorce or separation has the opposite effect. The relationship between other individual characteristics and life satisfaction is less clear. The use of gender is, for example, ambiguous (figure 11). In some studies it is found that the men are on average happier than women (Clark and Oswald, 1994; Clark, Oswald, and Warr, 1996 and Theodossiou, 1998) and the observed difference is explained by gender inequality and the fact that women are typically more critical of themselves and devalue themselves much more than men (Lowenthal et al, 1975). In other studies no difference in the level of life satisfaction between males and females is found (Frey and Stutzer, 2000). Another such example is that of having children (figure 12). Some claim that it brings life satisfaction (Plug, 1997), while others disagree with this and conclude that children do not have a significant impact on well-being (Clark and Oswald, 1994; Gerdtham and Johannesson, 1997 and Theodossious, 1998). Despite the dubious links, we have included a dummy for gender (male) of the respondent and a respondent's number of children in our dataset.

Figure 10: Marital status and life satisfaction



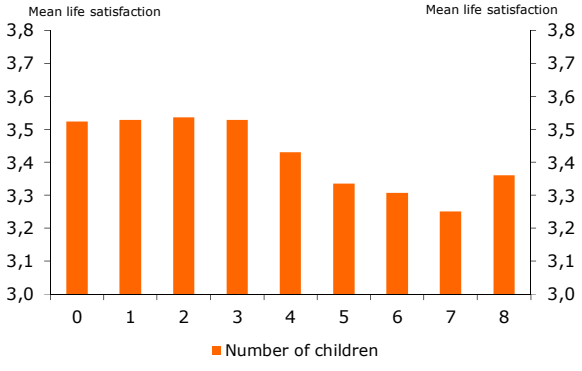
Source: World Values Survey

Figure 11: Gender and life satisfaction



Source: World Values Survey

Figure 12: Number of children and life satisfaction



Source: World Values Survey

Estimation results

Presentation of regression outcomes

The outcomes of the ordered probit estimations (see appendix A) will be described below. By comparing the contributions to explaining subjective well-being, we will also determine whether the dimension indicators proposed by Stiglitz et al (2009) form a better well-being measure than per capita GDP.

Table 1: Equation 1

Variable	Coefficient	Std. dev.
INCOME_LGDP	0.24*	0.00
AGE	-0.02*	0.00
AGE^2	0.00*	0.00
MARITAL_MARRIED	0.15*	0.00
MARITAL_DIVORCED	-0.07*	0.01
MALE	-0.03*	0.00
CHILDREN	0.00	0.00
Number of incl. obs.	133,509	
Pseudo R^2	0.02	
LR-statistic (p-value)	7921,31	(0.00)

Source: Rabobank

As expected the coefficient of the logarithm of per capita GDP is statistically significant and positive in all three models (see table 1 to 3).[16,17] Thus individuals who live in a country with a higher per capita GDP have a higher probability to report that they are satisfied with their lives. The income scale also has a positive and significant impact on life satisfaction, implying that people with a relative high income (compared to others within the same country) have a higher propensity to say that they enjoy their lives. This result corresponds with the fact that the mean life satisfaction of someone in the lowest scale is 3.17, while the mean life satisfaction for the average person in the highest scale is 4.11. If we use a respondent's satisfaction instead of the respondent's income scale, we also find a positive and significant relationship.

[16] Using income_lgni instead of using income_lgdp leads to similar results.
[17] Di Tella et al (2003) investigated whether the use of lagged GDP figures made a major difference for the estimation outcomes. They concluded that this was not the case when a one year lag was used, but when larger time-lags were used the effect of GDP on subjective well-being started to weaken.

Table 2: Equation 2

Variable	Coefficient	Std. dev.
INCOME_LGDP	0.23*	0.00
INCOME_SCALE	0.10*	0.00
AGE	-0.03*	0.00
AGE^2	0.00*	0.00
MARITAL_MARRIED	0.12*	0.00
MARITAL_DIVORCED	-0.03***	0.01
MALE	-0.05*	0.00
CHILDREN	0.01*	0.00
Number of incl. obs.	120,32	
Pseudo R^2	0.04	
LR-statistic (p-value)	12870,64	(0.00)

Source: Rabobank

Table 3: Equation 3

Variable	Coefficient	Std. dev.
INCOME_LGDP	0.16*	0.00
INCOME_SATFINANCIAL	0.26*	0.00
AGE	-0.01*	0.00
AGE^2	0.00*	0.00
MARITAL_MARRIED	0.10*	0.00
MARITAL_DIVORCED	0.00	0.01
MALE	-0.04*	0.00
CHILDREN	0.01*	0.00
Number of incl. obs.	130,756	
Pseudo R^2	0.12	
LR-statistic (p-value)	47988.98	(0.00)

Source: Rabobank

Estimation results

In all three equations we find (a weak) proof of a U-shaped relationship between life satisfaction and age, because the coefficient on age is significantly negative whereas the coefficient on age is significantly positive. Marriage also boosts life satisfaction in all three models. Being divorced or separated has a negative impact in the first model, but does not have a significant impact on life satisfaction in the other two equations.[18] This may be caused by the fact that too few data points are available, because less than 5% of the respondents have indicated to be divorced or separated. For this reason it may not be possible to draw reasonable conclusions on the relationship between being divorced and life satisfaction. Because of lack of explanatory power we will not include this variable in the rest of the analysis. In contrast to the results found in literature being a male decreases the odds of saying that one is satisfied. Despite the fact that a clear explanation for this result is lacking, we will continue to include this variable in our regression equations because the coefficient significantly differs from zero. The number of children does not have a significant impact in the first model, but in the latter two models the coefficient is significantly positive. Thus the well-being of respondents increases with the number of children.

The LR-statistics tells us that our model as a whole is statistically significant. The pseudo R^2 equals 0.02, 0.04 and 0.12 in equation one, two and three, respectively. Note that the pseudo R^2 cannot be interpreted exactly as R^2 in OLS regressions, because the former compares the maximized log-likelihood with the restricted log-likelihood that are generated in the ordered probit regression. However, Daykin and Moffiatt (2002) claim that the pseudo R^2 is best used to tell apart between different regression equations trying to explain the same dependent variable. Since the pseudo R^2 is highest for equation three, we will use this model as basis for the rest of the analysis.

Now we will compare the estimation outcomes of the third model with the estimation outcomes of a model that also takes the other well-being dimensions described by Stiglitz et al (2009) into account (table 4 to 6). The income variables have the same sign, remain significant and the magnitude of the coefficients hardly changes. The impact of the personal variables does also stay roughly the same. Respondents who describe their state of health as good, have a higher probability of being satisfied with their life than respondents with a poor subjective health status. Formal education also has a significant positive impact on the life satisfaction of respondents. If we look more closely at the educational level attained, we see that elementary and secondary education both add significantly to the well-being of respondents. Since the scale of both variables is the same, we can compare the coefficients and conclude that elementary education is only slightly more important for life satisfaction than secondary education. If we look

[18] The p-value depicted in the table is for a two-tailed z-statistic. However, we presume that being divorced or separated has a negative impact on life satisfaction. For this reason it may be more appropriate to use a one-tailed test and halve the p-value. In this case the coefficient is also not significant.

Estimation results

even more closely, we see that secondary school of the technical or vocational type matters most for the life satisfaction of individuals (table C.3, appendix C). Being unemployed has a significant negative impact on the reported level of life satisfaction, despite the fact that only ten per cent of the respondents reported being unemployed. Although the employment variable has the correct sign, the variable is insignificant. The lack of explanatory power does not come as a surprise. Over 50% of the respondents are employed and with this many people sharing the same personal characteristic you could expect there would be a great variation in reported life satisfaction. Therefore, we will not take this variable into account in the rest of the regression equations.[19] We have also included the importance of leisure as an explanatory variable. Just as expected, it can be concluded that people who value leisure more also have a higher probability of stating that they are satisfied with their life. People who feel that they have much freedom of choice and control over the way their lives turn also have a higher probability of reporting a high level of life satisfaction. The same is true for respondents who are of the opinion that there is more respect for human rights in their country. In line with previous research confidence in the government turns out to be important as well.[20] The results also suggest that respon-

[19] Being a housewife, student or retired does not have a significant impact on the reported level of life satisfaction.
[20] Other confidence indicators, such as confidence in the press, police, parliament and political parties, are either insignificant and /or enter the equation with the wrong sign.

Table 4: Equation 4

Variable	Coefficient	Std. dev.
INCOME_LGDP	0.20*	0.01
INCOME_SATFINANCIAL	0.21*	0.00
HEALTH_BGSTATUS	0.22*	0.01
EDU_FORMAL	0.03***	0.02
WORK_EMP	0.00	0.01
WORK_UMEMP	-0.08*	0.01
LEISURE_IMPORTANT	0.07*	0.00
GOVERN_FREEDOM	0.11*	0.00
GOVERN_HUMANRIGHTS	0.02*	0.00
GOVERN_CONFGOVERNMENT	0.03*	0.00
SOCIAL_GTRUST	-0.01	0.01
SOCIAL_VOLUNTEER	0.02*	0.00
ENVIRON_CO2	-0.01*	0.00
INSECURE_ECONOMIC	0.00*	0.00
AGE	-0.01*	0.00
AGE^2	0.00*	0
MARITAL_MARRIED	0.11*	0.01
MALE	-0.08*	0.01
CHILDREN	0.02*	0.00
Number of incl. obs.	87,883	
Pseudo R^2	0.14	
LR-statistic (p-value)	37407,75	(0.00)

Table 5: Equation 5

Variable	Coefficient	Std. dev.
INCOME_LGDP	0.20*	0.01
INCOME_SATFINANCIAL	0.21*	0.00
HEALTH_BGSTATUS	0.22*	0.01
EDU_FORMAL	0.03***	0.02
WORK_UMEMP	-0.08*	0.01
LEISURE_IMPORTANT	0.07*	0.00
GOVERN_FREEDOM	0.11*	0.00
GOVERN_HUMANRIGHTS	0.02*	0.00
GOVERN_CONFGOVERNMENT	0.03*	0.00
SOCIAL_VOLUNTEER	0.02*	0.00
ENVIRON_CO2	-0.01*	0.00
INSECURE_ECONOMIC	0.00*	0.00
AGE	-0.02*	0.00
AGE^2	0.00*	0
MARITAL_MARRIED	0.11*	0.01
MALE	-0.08*	0.01
CHILDREN	0.02*	0.00
Number of incl. obs.	87,883	
Pseudo R^2	0.14	
LR-statistic (p-value)	37407,17	(0.00)

Source: Rabobank

dents who think that most people can be trusted are not more satisfied with their lives than respondents who think that you need to be careful in dealing with people. This outcome contradicts our expectations of the influence of trust, but this may be caused by the fact that the question was asked in general terms. If we make a distinction between people you know and people you meet for the first time, we see that the former enhances life satisfaction while the latter has no impact. Civic involvement, measured by the variable social_volunteer, also increases the propensity to say that one is satisfied. The impact of environmental conditions on well-being is, as expected, negative. Finally, the impact of economic insecurity is slightly positive, which is a rather strange result for which an explanation is lacking.

Based on de pseudo R^2 of model three and model six, it can be concluded that the model including all eight well-being dimensions identified by Stiglitz et al (2009) is slightly favourable to the income model. However, given the small difference the evidence in favour of the use of multiple well-being dimensions is far from convincing and further research on the underlying determinants of life satisfaction is needed.

Robustness check

Difference between advanced and developing countries

The lack of explanatory power may be caused by the fact that we have included both developed and developing countries in our sample. Since these countries often do not have to deal with the same issues, we will look what happens to our regression results if we run separate regressions for the least developed, i.e. the bottom 25% of the countries in terms of per capita GDP in our sample[21], and the most developed countries, i.e. the top 25% of the countries in terms of per capita GDP in our sample[22].

The regression results are presented in table 6 and 7. For comparability we have used the same variables as in equation 4. If we compare the regression results, we see that the income variables are far more important for the least developed countries than for the most developed countries. This difference can be explained by the conditional relationship that exists between per capita GDP and life satisfaction. If people do not earn that much, an income rise can be easily transformed in higher living standards and a higher subjective well-being. However, if people already have a high income a little extra will not add much to their well-being. The regression results show that for people with a high income other needs, including a good health and leisure, become more important. Formal education does not have a significant impact on life satisfaction.[23] In developing countries this may not be important, because most people work in agriculture

[21] This is the case for all countries with a per capita GDP of less than 3,096.74.
[22] This is the case for all countries with a per capita GDP of more than 19,333.15.
[23] However, in overcoming poverty traps formal education is important.

Table 6: Regression results developing countries

Variable	Coefficient	Std. dev.
INCOME_LGDP	0.74*	0.05
INCOME_SATFINANCIAL	0.30*	0.00
HEALTH_BGSTATUS	0.12*	0.02
LEISURE_IMPORTANT	0.05*	0.01
GOVERN_FREEDOM	0.09*	0.00
GOVERN_HUMANRIGHTS	0.20*	0.01
GOVERN_CONFGOVERNMENT	0.07*	0.01
SOCIAL_GTRUST	0.09*	0.02
ENVIRON_CO2	-0.25*	0.02
INSECURE_ECONOMIC	0.00**	0.00
AGE	-0.01*	0.00
AGE^2	0.00*	0.00
MARITAL_MARRIED	0.06*	0.03
MALE	-0.08*	0.02
Number of incl. obs.	12,519	
Pseudo R^2	0.20	
LR-statistic (p-value)	7692,89	(0.00)

Source: Rabobank

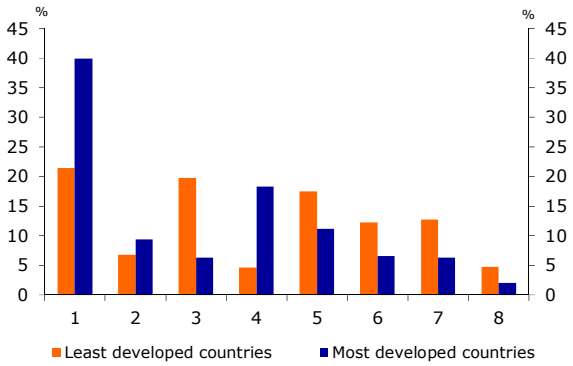
Table 7: Regression results developed countries

Variable	Coefficient	Std. dev.
INCOME_LGDP	0.47*	0.04
INCOME_SATFINANCIAL	0.21*	0.00
HEALTH_BGSTATUS	0.36*	0.01
WORK_EMP	0.06*	0.02
WORK_UMEMP	-0.12*	0.03
LEISURE_IMPORTANT	0.09*	0.01
GOVERN_FREEDOM	0.15*	0.00
GOVERN_HUMANRIGHTS	0.01*	0.01
GOVERN_CONFGOVERNMENT	0.04***	0.01
SOCIAL_GTRUST	0.08*	0.02
SOCIAL_VOLUNTEER	0.05*	0.01
ENVIRON_CO2	-0.01*	0.00
INSECURE_ECONOMIC	-0.01*	0.00
AGE	-0.02*	0.00
AGE^2	0.00*	0.00
MARITAL_MARRIED	0.23*	0.02
MALE	-0.05*	0.01
CHILDREN	0.04*	0.00
Number of incl. obs.	25,691	
Pseudo R^2	0.15	
LR-statistic (p-value)	10040,1	(0.00)

Source: Rabobank

for which formal education is not necessary. For rich countries an explanation is lacking. While the employment status of respondents does not play a role in developing countries, the same cannot be said for respondents who live in developed countries. This discrepancy may be explained by the fact that in comparison to rich countries more people in poor countries are self-employed and as a consequence the employment status has less impact on their life satisfaction (figure 13). The regression results also show that the relative importance of governance indicators depends on the development stage of a country. For poor countries respect for human rights is important, while freedom becomes more essential for countries in a higher development stage. Trust is equally important for developing and developed countries. This is, unsurprisingly, not the case for voluntary work. After all, if you have problems surviving yourself, you will not care that much about others. So logically, volunteering doesn't set great store in poor countries. The impact of environmental conditions on life satisfaction, measured by CO_2 emissions, is much bigger in the developing world than in the developed world. A potential explanation for this observation is that water and air pollution are more serious problems in poor countries, because (the enforcement of) rules and regulations are often lacking.

Figure 13: Employment status



Source: World Values Survey

For developing countries the pseudo R^2 increases to 0.19, whereas the pseudo R^2 for rich countries remains almost the same. The robustness check shows that the development stage of a country matters. The life satisfaction of people who live in the least developed countries can be enhanced by increasing per capita GDP, but striving for higher and higher GDP levels may not be a successful strategy for rich countries.

Conclusions

It's all about well-being

The progress of a society is often measured by the development of its GDP. However, the state of the economy is not what really matters in life, well-being is far more important. The use of per capita GDP as proxy for well-being is often criticized. Many have argued that GDP is an ineffective measure of how well society is doing and that other aspects should be taken into account. Many alternative well-being measures have been developed in the past. These alternative indicators have in common that they all take one or more of the following well-being dimensions into account: living standards, health, education, personal activities, governance, social connections, environmental conditions and/or insecurity (Stiglitz et al, 2009). Usually, these measures do this in an objective way. However, this approach may not be a good representation of the state of well-being that individuals experience. Therefore, it may be a good idea to look at subjective well-being.

We have shown that the eight well-being dimensions mentioned above are related to subjective well-being. Life satisfaction does not only correlate with living standards, but also with the other well-being dimensions. People who are employed are, for example, happier than people who are not employed and people living in societies that have more open political and social structures are also significantly more likely to be satisfied with their lives. Moreover, individual characteristics turn out to be important as well. This does not imply that per capita GDP is completely useless. Besides the fact that per capita GDP is an indicator for the economic activity within a country, it is also not a bad starting point for measuring well-being. This is especially true for the least developed countries in the world, where small increases in income may lead to huge increases in living standards and life satisfaction. For more advanced countries it makes sense to look at other well-being dimensions as well. In these countries governments should not simply follow policies that maximize economic growth, but they should look also at the consequences for well-being as trade-offs become more important. Since the marginal utility of income is diminishing, a higher income does not boost well-being that much. Instead little advances in some other well-being dimensions may do the trick. Governments in advanced countries should focus on the optimization of subjective well-being of their citizens. Rather than economic growth figures life satisfaction should be used as a measure that dictates how well policy makers are living up to society's expectations. In this respect the western world could learn something from the poor, but happy, Kingdom of Bhutan, where the government strives to maximize the happiness of its citizens. Whereas Bhutan could learn something from the more advanced countries and focus more on economic growth.

However, a word of warning is in place. In this Special the underlying determinants of life satisfaction have been investigated. Although this Special sheds

some light on factors that play a role, more research is needed. The empirical investigation into human happiness is still in its infancy and more and better measures are needed. As Stiglitz et al (2009) argue, the quality of life that a person experiences depends on his objective condition and his capabilities. On the one hand, data with respect to a person's health, education, personal activities, social connections and insecurity is often limited. Also little information on governance, social capital and environmental conditions is available and robust and reliable measures are almost non-existent. Therefore, steps should be taken to increase the amount of available information, because this will make it easier to conduct further research. On the other hand, one must be careful not to overstretch it. A "big brother is watching you"-scenario will surely have a negative impact on the well-being of people. With additional information it will be possible to construct new well-being measures, which do take all the eight well-being dimensions into account. Based on these new well-being measures policymakers can assess how and by how much certain policies affect the subjective well-being and whether the decisions they make are truly beneficial for everyone in society.

Rabobank often uses economic indicators to establish whether a country is faring well, but the conclusions from this Special tells us that we should no longer focus solely on those figures. After all: it's more than the economy, stupid! It's all about well-being. For this reason Rabobank will develop a well-being index to present an overview of the well-being of the Dutch population.

Appendix A

Methodology

Now we will explain the econometric methodology. We have already mentioned that we will employ an ordered response model in this Special, but this is not a very common approach. In most studies a linear regression method is used (Layard, 2005; Helliwell, 2003). However, in some studies, especially in studies were smaller ordinal categories are used, ordered response models are preferred (Di Tella et al, 2003; Clark et al, 2001).

We would like to explain the probability that a respondent gives a certain life satisfaction response as a function of several observed explanatory variables. Since probabilities must always lie between 0 and 1 that function has to ensure that for estimated probabilities, P_t, this condition is met, i.e. $P_i \equiv \Pr(y_i = j \mid \Omega_i) = F(X_i\beta)$, where Ω_i represents the information set for the i[th] respondent. The transformation function $F(.)$ has the properties $F(-\infty)=0$, $F(\infty)=1$ and $f(x) \equiv \frac{dF(x)}{sx} > 0$. As was already mentioned, we will make use of an ordered probit model. This model uses the cumulative standard Normal Distribution $\Phi(.) \equiv \frac{1}{2\sqrt{\pi}} \int_{-\infty}^{x} \exp(-\frac{1}{2}x^2)dx$ as a transformation function.

In an ordered probit model it is assumed that beneath the ordered responses, given by the dependent variable $y_i \in (1,2,...,10)$ that captures the reported life satisfaction of the i[th] respondent, there is an unobserved or latent continuously distributed random variable y_i° that captures the true satisfaction level of the i[th] individual. Suppose that $\gamma_1 < \gamma_2 < ... < \gamma_9$ are unknown cut points. Subsequently assume that y_i° is related to the observable ordinal variable y_i in the following way:

y_i = 1 if $-\infty < y_i^\circ < \gamma_1$

y_i = 2 if $\gamma_1 < y_i^\circ < \gamma_2$

:

y_i =9 if $\gamma_8 < y_i^\circ < \gamma_9$

y_i =10 if $\gamma_9 < y_i^\circ < \infty$

, where the unobserved life satisfaction outcome can be expressed as: $y_i^\circ = x_i\beta + \varepsilon_i$, x_i is a 1×K-vector of explanatory variables not containing a constant, β is a K×1-vector of unknown parameters and $\varepsilon_i \mid x_i \sim N(0,1)$. This model is called the latent variable model.

Now $\Pr_i$ can be derived as follows:

$$\Pr(y_i = 1 \mid x_i) = \Pr(y_i^\circ < \gamma_1 \mid x_i) = \Pr(x_i\beta + \varepsilon_i < \gamma_1 \mid x_i) = \Pr(\varepsilon_i < \gamma_1 - x_i\beta \mid x_i) = \Phi(\gamma_1 - x_i\beta)$$

$$\Pr(y_i = 2 \mid x_i) = \Pr(y_i^\circ < \gamma_2 \mid x_i) - \Pr(y_i^\circ < \gamma_1 \mid x_i) = \Pr(x_i\beta + \varepsilon_i < \gamma_2 \mid x_i) - \Pr(x_i\beta + \varepsilon_i < \gamma_1 \mid x_i)$$
$$= \Pr(\varepsilon_i < \gamma_2 - x_i\beta \mid x_i) - \Pr(\varepsilon_i < \gamma_1 - x_i\beta \mid x_i) = \Phi(\gamma_2 - x_i\beta) - \Phi(\gamma_1 - x_i\beta)$$

:

$$\Pr(y_i = 9 \mid x_i) = \Pr(y_i^\circ < \gamma_9 \mid x_i) - \Pr(y_i^\circ < \gamma_8 \mid x_i) = \Pr(x_i\beta + \varepsilon_i < \gamma_9 \mid x_i) - \Pr(x_i\beta + \varepsilon_i < \gamma_8 \mid x_i) =$$
$$\Pr(\varepsilon_i < \gamma_9 - x_i\beta \mid x_i) - \Pr(\varepsilon_i < \gamma_8 - x_i\beta \mid x_i) = \Phi(\gamma_9 - x_i\beta) - \Phi(\gamma_8 - x_i\beta)$$

Appendix A

$$\Pr(y_i = 10 \mid x_i) = \Pr(y_i^{\circ} > \gamma_9 \mid x_i) = \Pr(x_i\beta + \varepsilon_i > \gamma_9 \mid x_i) = \Pr(\varepsilon_i > \gamma_9 - x_i\beta \mid x_i) = 1 - \Phi(\gamma_9 - x_i\beta)$$

If we sum these probabilities we simply get the cumulative distribution function of the standard Normal Distribution. Therefore we can say that the probit model is developed from the latent variable model.

Next, the threshold parameters γ are estimated along with the β coefficients by maximizing the log likelihood function:

$l(\beta,\theta) = \sum_{i=1}^{N}\sum_{j=0}^{9} \log(\Pr(y_i = j \mid x_i, \beta, \theta)) I(y_i = j)$, where $I(.)$ is an indicator function which takes the value 1 if the argument is true and 0 if the argument is false.

References

Akcomak, I.S. and B. ter Weel (2008). The impact of social capital on crime: Evidence from the Netherlands. *IZA Discussion Paper*, No 3603, IZA.

Atkinson, G., R. Dubourg, K. Hamilton, M. Munasinghe, D. Pearce and C. Young (1997). *Measurin Sustainable Development: Macroeconomics and the Environment*. Cheltenham: Edward Elgar.

Barbieri, P., H. Russell and S. Paugam (1999). Social Capital and Exits from Unemployment. In D. Gallie and S. Paugam (eds.). *Welfare Regimes and the Experience of Unemployment in Europe*, Oxford: Oxford University Press, pp. 200-217.

Barro, R.J. (1991). Economic Growth in a Cross-section of Countries. *Quarterly Journal of Economic*, May, 106(2),pp. 407-433.

Bell, D. and D.G. Blanchflower (2007). The Scots may be brave but they are neither healthy nor happy. *Scottish Journal of Political Economy*, 54, pp. 166-194.

Benach, J. and C. Muntaner (2007). Precarious employment and health: Developing a research agenda. *Journal of Epidemiology and Community Health*, 61, pp. 276-277.

Benhabib, J. and M. Spiegel (1994). The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data. *Journal of Monetary Economics*, 43, pp. 143-174.

Bergh, C.J.M. (2007). Abolishing GDP. *Tinbergen Institute Discussion Paper*, TI 2007-019/3, Tinbergen Institute.

Bishop, D.S., N.B. Epstein and G.I. Keitner (1986). Stroke: morale, family functioning, health status, and functional capacity. *Archives of Physical Medicine and Rehabilitation*, 67(2), pp. 84–87.

Blancheflower, D.G. (2008). Is well-being U-shaped over the life cycle? NBER Working Paper, 12935, National Bureau of Economic Research.

Blanchflower, D.G., and A.J. Oswald (2004). Well-being over time in Britain and the USA. *Journal of Public Economics,* 88(7-8), pp. 1359-1386.

Blanchflower, D.G. and A.J Oswald (2007). Hypertension and happiness across nations. *Journal of Health Economics*, 27(2), pp. 218-233.

Bruni, L. and P.L. Porta (2007). *Introduction.* In Luigino Bruni and Pier Luigi Porta (esd.). *Handbook on the Economics of Happiness*. Cheltenham: Edward Elgar.

Buonanno, P., D. Montolio, and P. Vanin (2009). Does social capital reduce crime? *Journal of Law and Economics,* 52 (1), pp. 145-170.

Bynner, J., S. McIntosh, A. Vignoles, L. Dearden, H. Reed and J. Van Reenen (2001). Wider benefits of learning improving adult basic skills: Benefits to the individual and to society. *DfEE Wider Benefits of Learning Research Centre Report,* No. 251, London: London University.

References

Campagna, P.D., L.A. Rehman, D. Nordqvist, R.J.L. Murphy, G. Ness, J. Porter, R. Rasmussen and A. Thompson (2002). Children's participation in physically active leisure: income, gender, and regional differences. *Journal of Park and Recreation Administration, 20*, pp. 170-184.

Caldwell, L.L. (2005). Leisure and health: Why is leisure therapeutic? *British Journal of Guidance and Counselling, 33*, pp. 7-26.

Cattell, V., N. Dines, W. Gesler and S. Curtis (2008). Mingling, observing, and lingering: Everyday public spaces and their implications for well-being and social relations. *Health and Place, 14*, 544-561.

Clark, A., Y. Georgellis, and P. Sanfey (2001). Scarring: the Psychological Impact of Past Unemployment. *Economica,* 68(2), pp. 221–241.

Clark, A. and A. Oswald (1994). Unhappiness and Unemployment. *Economic Journal,*104, pp. 648–659.

Clark, A., A. Oswald, and P. Warr (1996). Is Job Satisfaction U-shaped in Age? *Journal of Occupational and Organizational Psychology,* 69, pp. 57–81.

Cobb, C., Halstead, T. and Rowe, J. (1995a). *The Genuine Progress Indicator: Summary of Data and Methodology* (Redefining Progress)

Cobb, C., Halstead, T. and Rowe, J. (1995b). If the GDP is Up, Why is America down? *Atlantic mon thly*, October 1995.

Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, S95-S120.

Daly, H.E. (1977). *Steady-State Economics*. San Francisco: W.H. Freeman.

Daly, H.E and J.B. Cobb (1989). *For the Common Good*. Boston: Beacon Press.

Daykin, A.R. and P.G. Moffatt (2002). Analyzing Ordered Responses: A Review of the Ordered Probit Model. *Understanding Statistics,* 1(3), pp. 157-166.

Dee, T.S. (2004). Are there civic returns to education? *Journal of Public Economics,* 88, pp. 1697-1720.

Di Bona, L. (2000). What are the benefits of leisure? An exploration using the leisure satisfaction scale. *British Journal of Occupational Therapy, 63*(2), pp. 50-58.

Diener, E. (1984). Subjective Well-Being. *Psychological Bulletin*, 95(3), pp. 542–75.

Diener, E., R.E. Lucas, C.N. Scollon (2006). Beyond the Hedonic Treadmill: Revising the Adaptation Theory of Well-Being. *American Psychologist*, 61(4), pp. 305–14.

Di Telli, R., R.J. Macculloch and A.J. Oswald (2001). Preferences over inflation and unemployment: Evidence from Surveys of Happiness. *American economic Review*, 91, pp. 335-341.

References

Di Tella, R., R.J. MacCulloch and A.J. Oswald (2003). The Macroeconomics of Happiness. *The Review of Economics and Statistics,* 85(4), pp. 809-827.

Easterlin, R.A. (1974). Does Economic Growth Improve the Human Lot? In P. A. David and M.W. Reder (eds.). *Nations and Households in Economic Growth: Essays in Honor of Moses Abramovitz.* New York: Academic Press.
Easterlin, R. (2004). The Economics of Happiness. *Daedalus*, 133(2), pp. 26-33.

Eurostat (2005). *Measuring progress towards a more sustainable Europe. Sustainable development indicators for the European Union. Data 1990-2005*. Luxembourg: Eurostat.

Frey, B. and A. Stutzer (2000). Happiness, Economy, and Institutions. *Economic Journal,* 110(466), pp. 918–938.

Frey, B. and A. Stutzer (2002). *Happines & Economics: how the economy and intuitions affect human well-being*. Princeton: Princeton University Press.

Gatti, U., R. E. Tremblay and D. Larocque (2003). Civic community and juvenile delinquency. a study of regions of italy. *British Journal of Criminology*, 43(1), pp. 22-40.

Garfinkel, I. and R. Haverman (1977). Earnings capacity, economic status, and poverty. In M. Moon and E. Smolensky (eds.). Improving measures of Economic Well-being. New York: Academic Press, pp. 54-74.

Gerdtham, U. and M. Johannesson (1997). The Relationship between Happiness, Health and Socio-Economic Factors: Results Based on Swedish Micro Data. Working Paper in Economics and Finance 207. Stockholm: Stockholm School of Economics.

Gerlach, K. and G. Stephan (1996). A Paper on Unhappiness and Unemployment in Germany. *Economics Letters,* 52, pp. 325–30.

Glass, J. and T. Fuijmoto (1994). Housework, paid work and depression among husbands and wives. *Journal of Health and Social Behavior*, 35, pp. 179-191.

Goldstein, M.S., J.M. Siegel and R. Boyer (1984). Predicting changes in perceived health status. *American Journal of Public Health*, 74(6), pp. 611–614.

Guiso, L., P. Sapienza and L. Zingales (2004). The role of social capital in financial development. *American Economic Review*, 94(3), pp. 526-556.

Helliwell, J. (2003). How's life? Combining individual and national variations to explain subjective wellbeing. *Economic Modelling,* 20, pp. 331-360.

Helliwell, J.F. and H. Huang (2008). How's Your Government? International Evidence Linking Good Governmnet and Well-Being. *British Journal of Political Science*, 38, pp. 595-616.

Helliwell, J.F. and R.D. Putnam (1999). Education and social capital, *NBER Working Paper,* No. 7121, National Bureau of Economic Research.

References

Helliwell, J.F. and R.D. Putnam (2004). The social context of well-being. In F.A. Huppert, B. Keverne and N. Baylis, (eds.). *The Science of Wellbeing.* Oxford: Oxford University Press, pp. 435-59.

Henderson, K.A. and B.E. Ainsworth (2002). Enjoyment: A link to physical activity, leisure, and health. *Journal of Park and Recreation Administration*, 20, pp. 130-146.

Hirsch, F. (1976). *Social Limits to Growth*. Harvard University Press, Cambridge, MA.

Hoeymans, E. J.M. Feskens, D. Kromhoup, and G.A.M. Van Den Bos (1997). Ageing and the relationship between functional status and self-rated health in elderly men. *Social Science and Medicine*, 45(10), pp. 1527–1536.

Hueting, R. (1974). *Nieuwe Schaarste and Economische Groei*. Elsevier, Amsterdam.

ILO (2011). http://www.ilo.org/global/topics/decent-work/lang--en/index.htm

Jamal, M. (2004). Burnout, stress and health of employees on non standard work schedules: a study of Canadian workers. Stress and Health, 20(3), 113-119.

Johnson, R.J. and F.D. Wolinsky (1993). The structure of health status among older adults: disease, disability, functional limitation, and perceived health. *Journal of Health and Social Behavior*, 34(2), pp. 105–121.

Kahneman, D. and A.B. Krueger (2006). Developments in the Measurement of Subjective Well-Being. *Journal of Economic Perspectives*, 20(1), pp. 3–24.

Kaufman, D., A. Kraay and M. Mastruzzi (2010). *The Worldwide Governance Indicators : A Summary of Methodology, Data and Analytical Issues*. World Bank Policy Research

Kempen, G. I.J.M., J. Ormel, E.I. Brilman, and J. Relyveld (1997). Adaptive responses among Dutch elderly: the impact of eight chronic medical conditions on health-related quality of life. *American Journal of Public Health*, 87(1), pp. 38–44.

Kenkel, D. (1991). Health Behavior, Health Knowledge, and Schooling. *Journal of Political Economy* 99(2), pp. 287-305.

Kim, S.H., G. Wolde-Tsadik, and D.B. Reuben (1997). Predictors of perceived health in hospitalized older persons: a cross-sectional and longitudinal study. *Journal of the American Geriatrics Society*, 45(4), pp. 420–426.

Knack, S. and P. Keefer (1997). Does social capital have an economic payoff? A cross-country investigation. *Quarterly Journal of Economics*, 112 (4), pp. 1251-1288.

Kodz, J., S. Davis, D. Lain, M. Strebler, J. Rick, P. Bates, J. Cummings and N. Meager (2003). *Working long hours: A review of the evidence*. London: DTI

References

Krueger, A. and M. Lindahl (1999). Education for growth in Sweden and the World. NBER Working Paper, No. 7190, National Bureau of Economic Research.

Krueger, A. and M. Lindahl (2001). Education for growth: why and for whom? Journal of Economic Literature, 39(4), pp. 1101–1136.

Kuznets, S. (1934). National Income 1939-1932. Senate document no. 124, 73d Congress, 2d session.

Kuznets, S. (1937). *National Income and Capital Formation, 1919–1935.* New York: National Bureau of Economic Research.

Kuznets, S. (1941). *National income and its composition 1919–1938.* National Bureau of Economic Research, New York.

Layard, R. (2005). *Happiness: Lessons from A New Science*. London: Penguin.

Lawn, P.A. (2000). Toward *Sustainable Development: An Ecological Economics Approach.* London: Lewis Publishers

Lloyd, K.M. and C.J. Auld (2002). The role of leisure in determining quality of life: Issues of content and measurement. *Social Indicators Research, 57*, pp. 43-71.

Lowenthal, M., M. Thurnher and D. Chiriboga. 1975. *Four Stages of Life*. San Fransisco: Jossey-Bass.

Mackenbach, J.P. (2006). Health Inequalities: Europe in Profile. UK Presidency of the EU, February.

Mannell, R.C. (2007). Leisure, health and wellbeing. *World Leisure, 3*, pp. 114-127.

Marlowe, J and D. Godwin (1988). The relationship of income and human capital to debt/asset ration of farm families. *Home Economics Reasearch Journal*, 17(1), pp. 95-109.

Mashlow, A. (1943). A Theory of Human Motivation. *Psychological Review*, 50, pp. 370-396.

Max-Neef, M. (1995). Economic growth and quality of life: A threshold hypothesis. *Ecological Economics,* 15, pp. 115–118.

McGillivray, Mark and Matthew Clarke. (2006). *Human Well-being: Concepts and Measures*. In Mark McGillivray and Matthew Clarke, eds. Understanding Human Well-Being. Basingstoke: Palgrave MacMillan.

Messner, S.F., E.P. Baumer and R. Rosenfeld (2004). Dimensions of social capital and rates of criminal homicide. *American Sociological Review*, 69, pp. 882-903.

Milligan, K., E. Moretti and P. Oreopoulos (2004). Does education improve citizenship? Evidence from the United States and the United Kingdom. *Journal of Public Economics,* 88, pp. 1667-1695.

Mishan, E.J. (1967). *The Cost of' Economic Growth*. London: Staples Press.

References

Moum, T. (1992). Self-assessed health among Norwegian adults. *Social Science and Medicine*, 35(7), pp. 935–947.

Mulrow, C.D., M.B. Gerety, J.E. Cornell, V.A. Lawrence, and D.N. Kanten (1994). The relationship between disease and function and perceived health in very frail elders. *Journal of the American Geriatrics Society*, 42(4), pp. 374–380.

Murphy, N.A. and Carbone, P.S. (2008). Promoting the participation of children with disabilities in sports, recreation, and physical activities. *Pediatrics, 121*, pp. 1057-1061.

Nimrod, G. (2007). Retirees' leisure: Activities, benefits, and their contribution to life satisfaction. *Leisure Studies, 26*, pp. 65-80.

Nordhaus, W. D. and J. Tobin (1972). Is Growth Obsolete? In: *Economic Growth*, National Bureau of Economic Research, General Series No. 96, National Bureau of Economic Research.

OECD (2001). *The well-being of nations. The role of human and social capital.* Paris: Organisation for Economic Co-operation and Development.

Ostir, G.V., K.S. Markides, M.K. Peek, and J.S. Goodwin (2001). The association between emotional well-being and the incidence of stroke in older adults. *Psychosomatic Medicine*, 63(2), pp. 210–215.

Oswald, A.J. (1997). Happiness and economic performance. *Economic Journal*, 107, pp. 1815-1831.

Ott, J.C. (2010). Good governance and happiness in nations: Technical quality precedes democracy and quality beats size. Journal of Happiness Studies, 11(3), pp.

Ott, J.C. (2011). Government and Happiness in 130 Nations: Good Governance Fosters Higher Level and More Equality of Happiness. Social indicators research, 102, pp 3-22.

Paim, L. (1995). Definitions and measurements of wellbeing: a review of literature. *Journal of Economic and Social Measurement*, 21, pp. 297-309

Perry-Jenkins, M., Goldberg, A.E., Pierce, C.P. and Sayer, A.G. (2007). Shift work, role overload, and the transition to parenthood. *Journal of marriage and the family*, 69(1), pp. 123-138.

Plug, E.J.S. (1997). Leyden welfare and beyond. Amsterdam: Thesis Publishers.

Putnam, R. D., (2000). Social Capital: Measurement and Consequences. Keynote Address at Symposium on the Contribution of Human and Social Capital to Sustained Economic Growth and Well-being, Quebec, March 19-21.

Putnam, R. (2000). *Bowling Alone: the collapse and revival of American community.* New York: Simon & Schuster.

Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy*, 6, pp. 65-78.

References

Repetti, R.L., K.A. Matthews and I. Waldron (1989). Employment and women's health: Effects of paid employment on women's mental and physical health. *American Psychologist*, 44(11), pp. 1394-1401.

Revicki, A. and J. P. Mitchell (1990). Strain, social support, and mental health in rural elderly individuals. *Journals of Gerontology*,45(6), pp. S267–S274.

Riley, J.C. (1997). *Sick, Not Dead: The Health of British Workingmen during the Mortality Decline.* Baltimore: Johns Hopkins University Press.

Rosenfeld, R., S.F. Messner, and E.P. Baumer (2001). Social capital and homicide. *Social Forces*, 80 (1), pp. 283-310.

Sen, A. (1976). Real national income. *Review of Economic Studies,* 43(1), pp. 19-39.

Sen, A. (1979). The welfare basis of real income comparisons. *Journal of Economic Literature,* 17(1), pp. 1-45.

Schuller, T., J. Bynner, A. Green, L. Blackwell, C. Hammond, and J. Preston (2000). Modelling and measuring the wider benefits of learning: an initial synthesis. Centre for Research on the Wider Benefits of Learning, Institute of Education/Birkbeck College, London University

Siedler, T. (2007). Schooling and citizenship: evidence from compulsory schooling reforms. *ISER Working Paper* 2007-2, University of Essex.

Stiglitz, J.E. (2005). The Ethical Economist - A review of "The Moral Consequences of Economic Growth". By B.M. Friedman (Knopf, 2005). *Foreign Affairs*, November/December 2005.

Stiglitz, J.E., A. Sen and J. Fitoussi (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress.* Paris: The Commission on Economic Performance and Social Progress.

Strandberg, T.E., A.Y. Strandberg, K.H. Pitkälä, V.V. Salomaa, R.S. Tilvis and T. A. Miettinen (2006). Cardiovascular risk in midlife and psychological well-being among older men. *Archives of Internal Medicine*, 166(20), pp. 2266–2271.

Squire, L. (1991). Poverty and adjustment in the 1980s. *World and Policy Bulletin*, 2(2), pp. 1-5.

Temple, J. (2001). Growth Effects of Education and Social Capital in the OECD. In J.F. Helliwell (ed.), The contribution of Human and Social Capital to Sustained Economic Growth and Well-being: International Symposium Report, Human Resource Development Canada and OECD.

Theodossiou, I. (1998). The Effects of Low-Pay and Unemployment on Psychological Well-Being: A Logistic Regression Approach. *Journal of Health Economics,* 18, pp. 85–104.

Tinbergen, J., and R. Hueting (1992). GNP and market prices: wrong signals for sustainable economic success that mask environmental destruction. In: R. Goodland, H. Daly and S. El Serafy (eds). *Population, Technology and Lifestyle: The Transition to Sustainability.* Island Press, Washington D.C.

References

Totten, M. (2007). *The health, social and economic benefits of increasing access to recreation for low-income families*. Ontario Task Group on Access to Recreation for Low-Income Families.

Touya, D. M. (2006). *Can we teach civic attitudes?* Estudios Sobre la Economía Española. Mimeo.

UNDP (1990). *Human Development report 1990 Concept and Measurement of Human Development*. New York: United Nations Development Program.

UNDP (2010). *Human Development report 2010 The Real Wealth of Nations: Paths to Human Development*. New York: United Nations Development Program.

Veenhoven, R. (2007). Subjective measures of well-being. Discussion Paper No. 2004/07. United Nations University: WIDER.

Verba, S., K.L. Schlozman, and H.E. Brady (1995) *Voice and Equality: Civic Voluntarism in American Politics*. Cambridge, Massachusetts: Harvard University Press

Warburton, D.E.R., Nicol, C.W., & Bredin, S.S.D. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal, 174*, pp. 801-809.

Weisbrod, W.A. and W.L. Hansen (1977). An income net-worth approach to measuring economic welfare. In M. Moon and E. Smolensky (eds), Improving measures of Economic Well-being. New York: Academic Press, pp. 34-50.

WHO (1946). Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19–22 June 1946.

Winkelmann, L. and R. Winkelmann (1998). Why Are the Unemployed So Unhappy? Evidence from Panel Data. *Economica,* 65, pp. 1–17.

Wolfe, B. and R. Haveman (2001). Accounting for the social and non-market Benefits of Education. In J.F. Helliwell (ed.), The contribution of Human and Social Capital to Sustained Economic Growth and Well-being: International Symposium Report, Human Resource Development Canada and OECD.

Wu, Z. and C. M. Schimmele (2006). Psychological disposition and self-reported health among the 'oldest-old' in China. *Ageing and Society*, 26(1), pp. 135–151.

Zoerink, D.A. (2001).Exploring the relationship between leisure and health of senior adults with orthopedic disabilities living in rural areas. *Activities, Adaptation, and Aging, 26*, pp. 61-73.

Colophon

The Special is a publication of the Economic Research Department (ERD) of Rabobank Nederland. The view presented in this publication has been based on data from sources we consider to be reliable. Among others, these include the World Values Survey and OECD.

This data has been carefully incorporated into our analyses. Rabobank Nederland accepts, however, no liability whatsoever should the data or prognoses presented in this publication contain any errors. The information concerned is of a general nature and is subject to change.

The Economic Research Department is also on the internet: www.rabobank.com/economics

For other information, please call the ERD secretariat on tel. +31 30 – 2162666 or send an email to 'economics@rn.rabobank.nl'.

Text contributor:
Ruth van de Belt, R.Belt@rn.rabobank.nl, + 31 30 2130146

Editor-in-chief:
Hans Stegeman, head National Macro Economic Research

Production coordinator:
Christel Frentz

Economic Research Department online
www.rabobank.com/economics

Postal address
Rabobank Nederland
Economic Research Department (UEL A.00.02)
P.O. Box 17100
3500 HG Utrecht
The Netherlands

Office address
Rabobank Nederland
Eendrachtlaan 10
3526 LB Utrecht
The Netherlands