



## Measures of well-being

September 8, 2006

### There is more to it than GDP

Happiness is what people cherish most. In order to influence happiness, policy-makers need measures for it. So far, there is no consensus on the best measure.

**GDP** only measures the market value of all final goods and services produced within a country in a given period. It is the most widely followed metric for assessing an economy's performance. However, GDP includes many items that do not help well-being: depreciation, income going to foreigners, and regrettable security expenditure.

**Economic well-being** is a broader concept, but still restricted to material aspects. It is influenced by parts of GDP, by non-market activity, leisure and wealth. Unemployment and income inequality tend to reduce economic well-being. The Centre for the Study of Living Standards sees the highest economic well-being in Norway, France and Belgium.

**Individual living conditions** also include non-material aspects such as health, life expectancy, education and the state of the environment. The Weighted Index of Social Progress sees Sweden, Denmark and Norway on top, while the Happy Planet Index sees Colombia and Costa Rica among the leaders.

**Happiness, as the ultimate goal, requires the most encompassing measure.** This happiness depends primarily on family, friends, work satisfaction and activities. Income does not play a major role. Unfortunately, society-wide happiness – as assessed via surveys – does not change much over time.

More and more countries are publishing or developing national well-being accounts. This trend may soon also reach continental Europe. Understanding the different layers of well-being is crucial for understanding choices made by individuals and policymakers.

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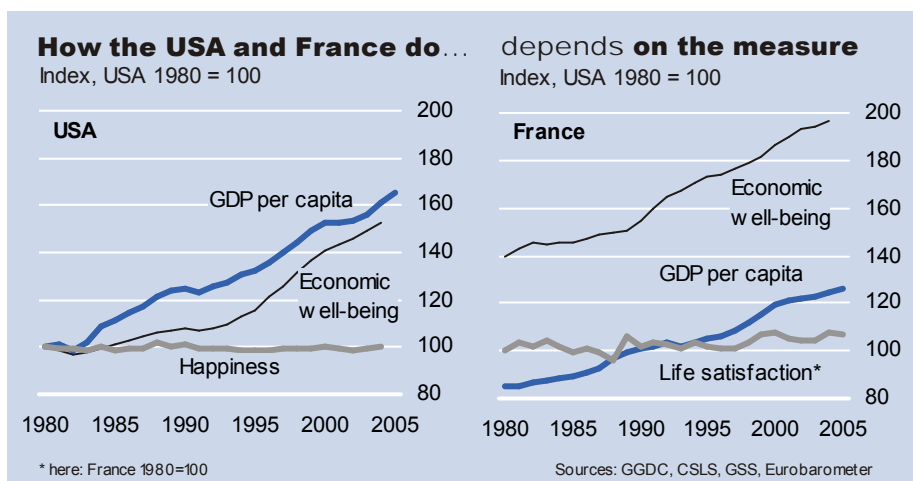
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**GDP is not an ideal yardstick for well-being**

Deutsche Bank Research’s megatopic “Global growth centres” mainly focuses on the evolution of gross domestic product (GDP) as the market value of all final goods and services produced within a country in a given period of time. However, we made clear from the start that this “is not an ideal yardstick for the well-being of citizens in the various countries.”<sup>1</sup> Well-being and happiness depend on many other aspects.

The chart at the bottom of this page illustrates the structure of the literature on well-being and of this note. The starting point is the well-known concept of GDP. Capital consumption, income going to foreigners and production of items that cause damage (e.g. pollution) are subtracted. What is then left of GDP (or even a subset of it) is the starting point for measures of economic well-being. These add non-market activity, the value of leisure and wealth, and subtract the cost of unemployment and income insecurity.

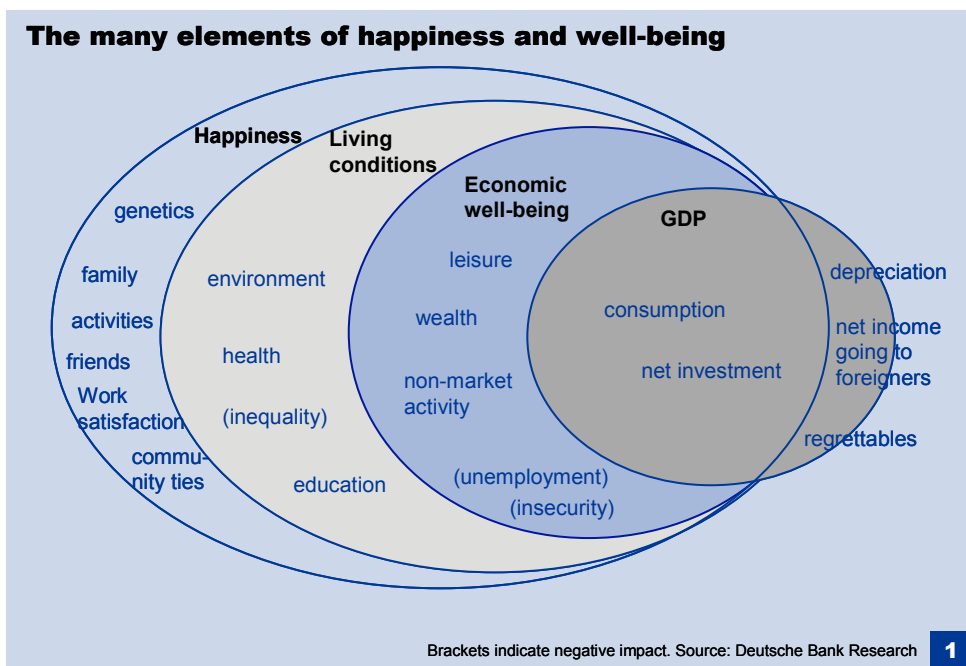
**The non-economic dimensions of well-being**

But well-being also has non-economic dimensions: good health and education, a clean environment and safe streets all contribute to individuals’ overall well-being. These elements are difficult to quantify and to aggregate, but their importance indicates that it might be worthwhile for those who determine the priorities of economic policy to evaluate and track them.

Finally, the ultimate goal of humans appears to be happiness (or life satisfaction). For good reasons, the US constitution lists as unalienable rights: life, liberty and the pursuit of happiness. Although happiness is inherently difficult to measure, surveys provide valuable insights on the levels and determinants of individuals’ overall satisfaction with life.<sup>2</sup>

**Many different attempts to measure well-being**

This note will present some of the measures calculated by international and private institutions. Like GDP, these measures are partly arbitrary, limited in scope, and reflect the normative priorities of those constructing them. They cannot and will not replace GDP. But they are important complements that provide a broader picture of how a society is doing.



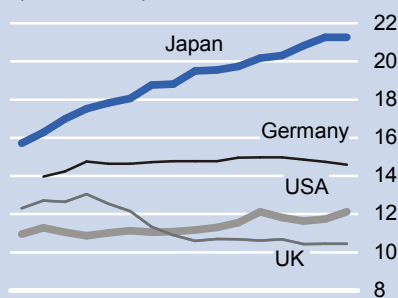
<sup>1</sup> Page 8 in “Global growth centres 2020” published in March 2005.

<sup>2</sup> Since there is no agreement on terminology or measurement some of the terms used here may differ from those in other sources.

**Improve understanding of individual choices and policy measures**

**Japan consumes more and more capital**

Capital consumption as % of GDP

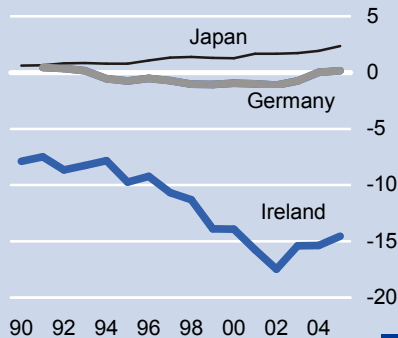


Source: AMECO database

2

**15% of Irish GDP go abroad**

Net primary income from abroad as % of GDP



Source: AMECO database

3

**Irish national accounts**

EUR bn

	1990	2005	% yoy
Gross domestic product	37.7	160.3	10.1
plus: Net income from abroad	-3.0	-23.3	14.7
= Gross national product	34.7	137.0	9.6
./. Consumption of capital	3.5	14.6	10.0
= Net national product	31.2	122.5	9.5

Source: Central Statistics Office Ireland

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Also, this note will show that the paths of well-being indicators – and especially of measures of happiness – differ significantly from the paths of GDP in most countries. And it will show that some of the assumptions in standard economic models are violated: people’s happiness is negatively affected by income of others; people adapt quickly to higher income; and tastes are not constant but depend on circumstances.

Looking at the items that really matter to humans is important in several ways: this may help to understand the choices that individuals make which might not increase GDP. In addition, broader measures can help analyse policy priorities both in a positive and in a normative way.

**1. The purpose and limitations of GDP**

All too often, GDP is interpreted as a measure of welfare or well-being – which it is not and was never designed to be. GDP only measures the market value of final goods and services produced in a country. The development of the national income and product accounts was spurred by the Great Depression and the lack of information that could be used for stabilising the economy through fiscal or monetary policy. The first official release of GDP data in the US came in 1942, accelerated by the need to assess the production possibilities in a war-time economy.

GDP has four major limitations which restrict its use as a measure of well-being. First, it includes the replacement of depreciated capital: it is a “gross” concept. However, depreciation does not boost welfare and the replacement of old capital just takes the economy back to square one. This capital consumption amounts to between 10% (UK and Ireland) and more than 20% (Japan) of GDP. As chart 2 shows, the share has risen significantly in Japan over the past 15 years: part of the rise in GDP did not benefit consumers but only went to replacing physical capital. Subtracting capital consumption from GDP leads to net domestic product.

The second difficulty with GDP is that it measures income produced in a country but not how much income people in that country receive. Some income may go to foreigners. This is particularly the case in Ireland, which transfers 15% of primary income to the rest of the world, up from 8% in the early 1990s. In other words, a significant portion of the rise in Irish GDP in the 1990s benefited foreigners. By contrast, Japan and Germany are net recipients of income from abroad – with a rising trajectory as chart 3 shows. Here, the rise in income of residents is outpacing the rise in GDP. Subtracting net income receipts from abroad from net domestic product leads to net national product. Table 4 shows that net national product still rose by 9.5% per annum in Ireland over the past 15 years in nominal terms – but the level of net national product is 24% below GDP.

Third, since GDP only counts monetary transactions (including estimates for those in the shadow economy), it misses many other activities that people value like caring for children or elderly at home. GDP also ignores the value of leisure time spent relaxing or with family and friends. It does not include the value of clean air and water. Therefore, any useful measure of well-being would try to capture these items, as illustrated in chart 1. The next section will present some of the attempts to do so.

### High economic well-being in Europe

Overall Economic Well-being Index  
(Original subcomponents weighting)



Source: Centre for the Study of Living Standards **5**

### Components of economic well-being

France = 100

	Weight	FR	DK	DE	US
Consumption	40%	100	79	78	133
Wealth	10%	100	124	131	110
Inequality	25%	100	90	95	25
Security	25%	100	124	91	29
<b>Overall</b>	<b>100%</b>	<b>100</b>	<b>97</b>	<b>90</b>	<b>78</b>

Source: Centre for the Study of Living Standards **6**

### Human development index is rising globally



Source: UN **7**

Finally, GDP includes many items that do not boost human well-being. If a hurricane or an earthquake destroys an entire region, the reconstruction effort is counted as a boost to GDP – even if it only replaces something that was there not long before. Likewise, expenditure on crime prevention and security adds significantly to GDP in many countries – but only restores a safe environment. Medical expenditure as a result of air and noise pollution also adds to GDP as do diet classes, antidepressants and a sizeable list of other items. However, taken to the extreme this line of reasoning would imply that basic food and clothing also should not be included. This again highlights some of the arbitrariness of the different measures.

## 2. From GDP to economic well-being

Nobel laureate James Tobin and William Nordhaus highlighted in the early 1970s that “GDP is not a measure of welfare” and proposed a Measure of Economic Welfare (MEW) that adds to GNP the value of household services and leisure, subtracts the cost of capital consumption and of “bads” such as pollution, and excludes for example police services to combat crime. Many later studies followed their lead. Components and weights of the different measures usually depend on the researchers’ subjective assessment.

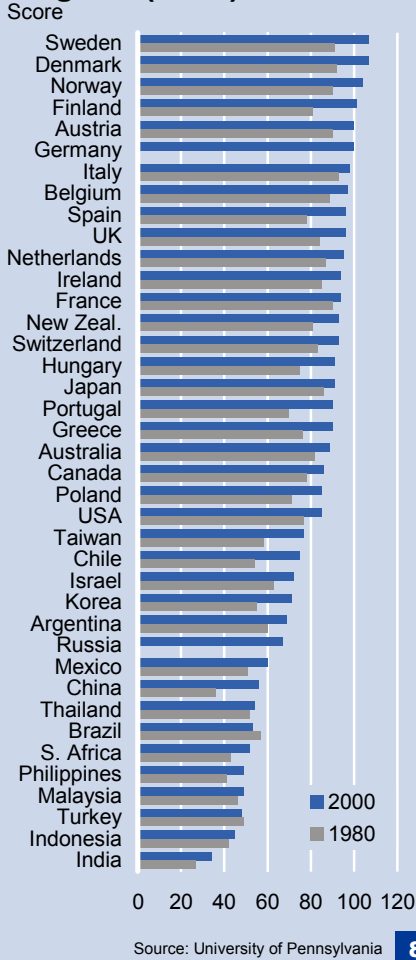
A very comprehensive and thorough Index of Economic Well-Being comes from the Canadian Centre for the Study of Living Standards (CSLS, Chart 5). As table 6 shows, it starts from the flow of private and government consumption (but not household work). The stock of physical and human capital owned by residents is the second pillar and tries to measure the stock of productive resources that can be passed on to the next generation. The third pillar captures inequality through the Gini coefficient and the poverty intensity. Finally, the security component aggregates diverse items such as divorce rates and employment rates (with a negative sign). The overall Index of Economic Well-Being is a weighted average of the four pillars. The weights were originally set at 0.4, 0.1, 0.25 and 0.25. Indices based on alternative weights are also published.

The preliminary 2004 results show Norway with the highest economic well-being among the 14 countries covered. France and Belgium are not far behind while the UK and Spain are the laggards (see chart 5). This ranking differs significantly from the ranking for GDP per capita and clearly favours countries with high income equality and low insecurity. The largest improvements in this index over the last 20 years came in the USA, France and Germany.

The OECD has recognised the importance of measuring well-being<sup>3</sup> and several countries publish or are developing national economic well-being measures. So far, there is no international standard for calculating them. The measures differ significantly across countries and may reflect the values and priorities of the researchers who construct them. Over the coming decades we are likely to see more standardisation in this area.

<sup>3</sup> See Boarini et al. (2006).

### Weighted Index of Social Progress (WISP)



### 3. Broader measures of living conditions

Still, consumption, wealth, equality and security only capture part of a human's well-being. Many other elements are relevant as well. As Tony Blair put it: "We have failed to see how our economy, our environment and our society are all one. And that delivering the best possible quality of life for us all means more than concentrating solely on economic growth."<sup>4</sup>

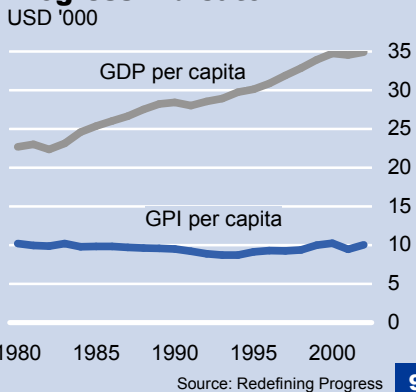
The best-known, but rather narrow measure of human living conditions is the United Nations' annual Human Development Index (HDI). It is available for a large number of countries and has a long history, but probably is not a true measure of well-being. The index combines the levels of life expectancy, education and GDP to measure human development. In 2003, Norway, Canada, Australia and Sweden achieved the top scores – largely on account of their high education levels (chart 7 on page 5). Since 1990, some of the largest improvements in the HDI have been reported in China, India, Korea and Ireland – partly because of the strong gains in GDP there. The HDI is a valued contribution, but still narrow in scope and highly correlated with GDP.

A more comprehensive measure of human living conditions is the Weighted Index of Social Progress (WISP) calculated by Richard Estes at the University of Pennsylvania for 163 countries and going back to 1970. This index tries to capture many dimensions of well-being, covering a range including income, education, health, role of women, environment, social peace, diversity and welfare – although data limitations admittedly lead to the inclusion of some peculiar measures. In the year 2000, Sweden, Denmark and Norway led the ranking (see chart 8). Between 1980 and 2000, Chile, Finland, Portugal and China recorded the largest improvements.

The UK's "new economics foundation" publishes a Happy Planet Index (HPI) which looks for countries where people live long and happy lives without damaging the planet. The HPI combines data on life expectancy, surveys on life satisfaction and the consumption of natural resources (energy, land etc.). The chart on the next page shows that Vanuatu, Colombia and Costa Rica top the HPI, while Germany comes in 81st and the USA 150th. With its strong focus on the environment, this index favours countries near the equator. Anecdotal evidence suggests that the HPI may be a good guide for holiday destinations.

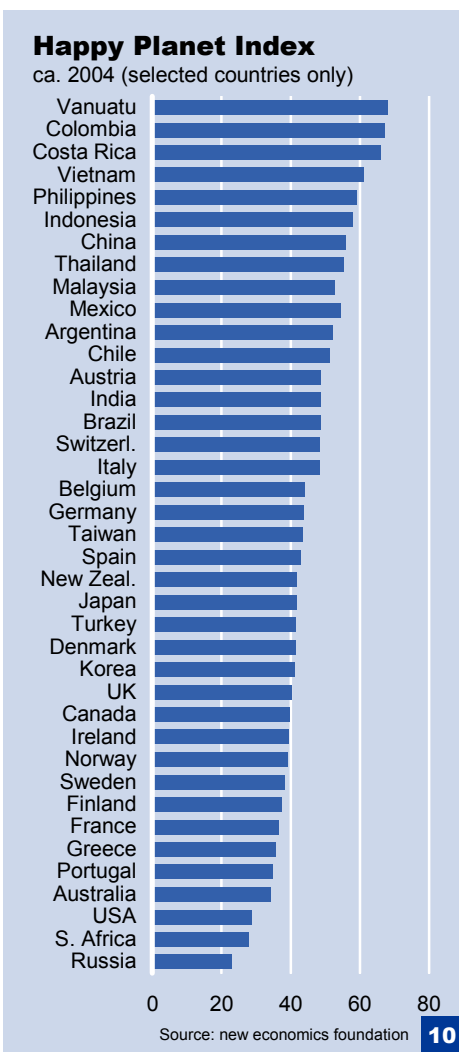
The "new economics foundation" also publishes time series for a Measure of Domestic Progress (MDP) for the UK. From their economic indicators (mainly consumer expenditure) they subtract social costs (inequality, accidents, crime, family breakdown etc.), environmental costs and the loss of natural resources. The overall result is an indicator that peaked in the mid-1970s, declined until the mid-1980s and has not yet regained that peak. Rising social and environmental costs are the main reasons for the long-run stagnation of the overall MDP. Given the Labour government's focus on improving the overall quality of life in the UK, this measure probably has some influence on policy priorities – and policy is likely to influence measured well-being.

### No rise in the US Genuine Progress Indicator



<sup>4</sup> Foreword to the UK's first report on "A better quality of life" of 1999. <http://www.sustainable-development.gov.uk/publications/uk-strategy99/foreword.htm>





For the US, Redefining Progress, a private research institute, publishes a very broad Genuine Progress Indicator (GPI), which is similar to the MDP for the UK. It starts with personal consumption, adds the value of household work, net fixed investment and the value of services of consumer durables. Then the costs of commuting, loss of wetlands, the depletion of non-renewable resources and several other costs are subtracted. Chart 9 shows the GPI per capita compared to GDP per capita. The long-run stagnation of the GPI is in sharp contrast to the 55% rise in per capita GDP since 1980.

Since 2002, the government of New Zealand has published an Economic Living Standard Index (ELSI) based on a survey of 7,000 people. It covers consumption, ownership of durable goods, social participation (e.g. night out once a fortnight), and a self-assessment of the living standard. In 2004, 8% of New Zealanders lived in severe hardship (level 1), 27% had good living standards (level 6) and 8% had very good living standards (level 7). The overall ELSI has risen slightly since 2002.

The Australian Centre on Quality of Life has published a National Wellbeing Index since 2001 which is based on a sample of 2,000 individuals who assess the economic situation in Australia, the state of the environment and of social conditions, the satisfaction with government and business, and national security.

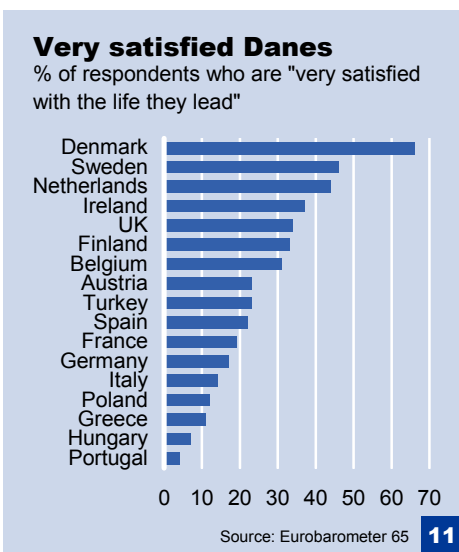
In the USA, the Department of Health and Human Services announced in late 2004 that it plans to construct a National Well-Being Account with the help of Nobel Prize winner Daniel Kahneman to provide a broad measure of the well-being of people of all ages. It will be based on the Day Reconstruction Method (DRM) which assesses how people spend their time and how they feel about, or experience, activities throughout a given day.

In Germany, no comparable index exists so far and the Federal Statistical Office is not aware of any attempts to change this situation.

## 4. Happiness and satisfaction with life

The well-being indicators give a much broader picture of the state of a society than GDP – but they still cannot tell us how happy or satisfied individuals are (or describe their subjective well-being).<sup>5</sup> Measuring happiness requires a different approach than is used for the indicators presented above: surveys. Since the mid-1970s, the European Commission's Eurobarometer has included a question on life satisfaction. According to the survey of spring 2006, 66% of Danes said they were very satisfied with the life they lead – the highest share in the sample. Only 17% of Germans and just 4% of the Portuguese felt the same way, as chart 11 shows.

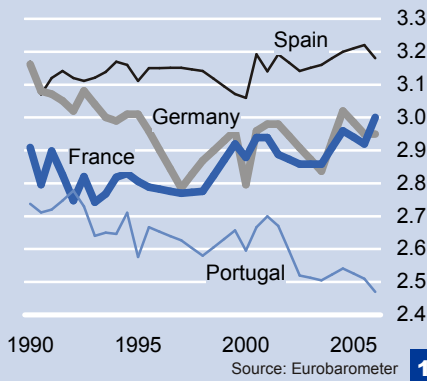
Over the past 15 years, the average level of life satisfaction has not changed much in spite of the large increase in per capita income (as also illustrated by the chart on page 1). Satisfaction improved in France, Italy, and Spain, while it fell in Germany and Portugal (see chart 12 on page 8). In France, the start of the upward move coincided with their hosting and winning the football World Cup in 1998. The only hump in Portuguese satisfaction occurred after they reached the semi-finals in the European championships in 2000. In Germany, the reunification euphoria of the early 1990s was followed by an erosion of satisfaction until 1997 – the year before the change



<sup>5</sup> Usually, happiness and satisfaction are used interchangeably. There is no uniform terminology yet.

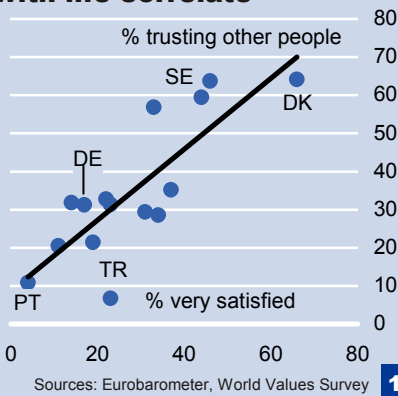
### Satisfaction improved in France and Spain

Weighted average of responses: very satisfied = 4; not at all satisfied = 0



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### Trust and satisfaction with life correlate



13

### Happiness-boosting activities

- Start a new exercise program
- Be kind to others
- Foster intimate relationships
- Count your blessings
- See things in a positive light
- Set yourself meaningful goals
- Work in a challenging job
- Add variety to your life
- Develop your personality

Source: Lyubomirsky et al. (2005)

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to an SPD-Green government. Following this summer's football World Cup, the next Eurobarometer is likely to show an increase in life satisfaction in Germany (and possibly in Italy). This brief history of happiness in Europe illustrates that satisfaction of life may be influenced by factors other than income, that it is very difficult to boost satisfaction on a sustainable basis, and that changes in satisfaction may contribute to political changes. The causality goes both ways. Across the EU, there is a very high correlation between satisfaction with life and the level of trust in compatriots, as chart 13 below shows.

Three main reasons explain the long-run stagnation of happiness and life satisfaction. First, people simply get used to the higher income, consumption or circumstances: driving that new car for the first time may make you really happy – but this effect evaporates over time (hedonic treadmill). Likewise, people who moved to California are not happier than people in Wisconsin in the long run. Once basic needs are met, more income does not tend to boost happiness. Second, humans tend to aim ever higher: once the new house is completed, one may feel that it would be even better to have a house in a better or safer neighbourhood (the satisfaction treadmill). Third, an individual's satisfaction tends to be influenced by how well others are doing. Driving a big car may make you happy if you are the only person with such a car – but satisfaction with that same car quickly diminishes if friends and neighbours drive similar cars. Even worse, if you buy a big car, this may depress the happiness of your neighbours, so aggregate happiness may not rise. Boosting happiness or life satisfaction is not easy. Psychologists, philosophers, economists and many others have explored this question intensively over recent years. According to Lyubomirsky et al. (2005) a part of happiness appears to be genetically determined (around 50%), another part determined by happiness-relevant activities (40%) and the remainder by circumstances (income, climate, environment, stable democracy etc.). Table 14 shows a list of activities that tend to have a positive impact on happiness. Table 15 shows how much individuals value certain activities and how much time they spend on them: socialising after work, for example, has a net average value of 4.12 (on a scale of 0 to 6) and people spend more than one hour daily on it. Commuting to work and working itself rank at the bottom of this list.





## 5. Outlook and policy implications

### The affect of activities

	Time spent	Affect
Intimate relations	0.2	4.74
Socializing after work	1.2	4.12
Dinner	0.8	3.96
Relaxing	2.2	3.91
Lunch	0.5	3.91
Exercising	0.2	3.82
Praying	0.5	3.76
Socializing at work	1.1	3.75
Watching TV	2.2	3.62
Phone at home	0.9	3.49
Napping	0.9	3.27
Cooking	1.1	3.24
Shopping	0.4	3.21
Housework	1.1	2.96
Childcare	1.1	2.95
Evening commute	0.6	2.78
Working	6.9	2.65
Morning commute	0.4	2.03

Sample: 909 women in Texas

Source: Kahneman et al. (2004)

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Economic indicators are important for steering economic policy and individual decisions. GDP is a crucial input for monetary policy that tries to keep inflation low by keeping output close to its long-run trend. It also is a good proxy for a government's tax base. But for many other aspects of policy GDP is not sufficient. Many additional indicators are required to provide adequate feedback for policy-makers.

As things stand today, there is no consensus on how to best measure well-being and happiness. The different indicators presented in this note come to vastly differing conclusions. Over the coming years there is a good chance that measuring and improving life satisfaction will become a more important focus of policymakers. Measuring standards are also likely to become more harmonised.

Some of the policy conclusions drawn by researchers in the happiness field differ significantly from those in standard economics.

1. **Measure well-being.** To know what is important and to be able to influence it, societies have to measure well-being, happiness and their components.
2. **Reduce unemployment.** Unemployment has a major negative effect on well-being both for those directly affected and for all other citizens.
3. **Foster happiness-boosting use of time.** People tend to work too much because they overestimate the impact of income on happiness. Taxing income improves work-life balances, although it is unlikely that the optimal tax rate lies above those in continental Europe.
4. **Strengthen civil society and active citizenship, participation and engagement.** Foster interaction among friends and family; contain geographic relocation, which hurts social interaction with friends and neighbours.
5. **Limit materialistic advertisement.** Research shows that people who watch a lot of TV feel poorer. Comparison with the pretty, successful and happy but artificial individuals in commercials makes one's own weaknesses visible – especially for children and teenagers. Sweden has banned advertisements targeted at children below 12 years of age.
6. **Focus the health sector on complete health.** The WHO defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". This includes a stronger focus on mental illness and on longevity.

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## References

- Boarini, Romina, Asa Johansson and Marco Mira d'Ercole (2006). Alternative measures of well-being. OECD Social, employment and migration working papers No. 33.
- Frey, Bruno and Alois Stutzer (2002). What can economists learn from happiness research? *Journal of Economic Literature* 40(2), pp. 402-435.
- Kahneman, Daniel, Alan B. Krueger, David Schkade, Norbert Schwarz and Arthur Stone (2004). Toward national well-being accounts. *American Economic Review* 94(2) Papers and Proceedings, pp. 429-434.
- Layard, Richard (2006). Happiness and public policy: A challenge to the profession. *Economic Journal* 116, pp. C24-C33.
- Lyubomirsky, Sonja, Kennon M. Sheldon and David Schkade (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology* 9(2), pp. 111-131.

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