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'European responses to the crisis and alternatives to GDP as an element of a
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Overview of Alternative Indicators measuring societal progress

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Introduction

Over the past 10 years there has been an explosion of interest in producing measures of societal progress. Measures that go beyond GDP to represent a broader view of the ways in which societies are progressing and regressing. Measures which are based on the values of a society, not those of a single political party or an elite view. Such sets of progress measures can help governments focus in a more joined up way on what really matters: they can foster a more informed debate on where a society actually is, where it wants to head, and – crucially – the choices it needs to make if it is to get there.

GDP shortcomings, as an index for measuring socio-economic progress, feature again prominently in the public debate, following years of neglect. GDP suffers from three major weaknesses:

(1) being a monetary aggregate, it pays little or no attention to distributional issues and to elements of human activity or well-being for which no direct or indirect market valuation is available; (2) there are problems concerning the measurement of non market output and its aggregation with market production; (3) it is measuring productive flows and, as such, ignores the impact of productive activities on stock, including stocks of natural resources.

These criticisms first culminated during the mid-seventies with worries about ecological limits to growth and an increasing concern over the relative weights to be given to economic and social aspects of human progress. Some early initiatives took place at that time, such as the attempt by Nordhaus and Tobin (1973) to develop a measure of economic welfare (MEW), based on GDP, but correcting GDP by subtracting estimates of certain costs, excluding some services and adding some household and leisure activities. Following these early moves, interest in alternative approaches to GDP temporarily fell, but resumed progressively during the 90s. Emblematic of this new trend was the creation of the United Nations Human Development Index (HDI) that combines GDP with measures of health and educational achievement.

In recent years the debate about alternative indicators for societal progress has again flourished up and has caught the attention of wide scientific and political circles. The first part of the underlying paper aims at giving a brief overview of the international and national initiatives in this respect. The second part of the paper will outline and briefly discuss the used methodology of a variety of indicators that should correct or replace the widely used GDP.

1. Overview of the major initiatives related to alternative ways of measuring progress

A. Initiatives at the international level

In 1992 the UN Summit in Rio de Janeiro brought the notion of Sustainable Development into the policy debate, with positive consequences for the promotion of sustainable development indicators. The "OECD Global Project on Measuring the Progress of Societies" has been installed since 2004 to foster the development of economic, social and environmental indicators to measure the well-being of a society. It also seeks to encourage the use of indicator sets to inform and promote evidence-based decision making. Recently, the Second OECD World Forum on Statistics, Knowledge and Politics (June 2007) led to the Istanbul Declaration which has been signed by the European Commission, the Organization of the Islamic Conference, the OECD, the United Nations, the United Nations Development Programme (UNDP), the United Nations Children's Fund (UNICEF),

the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Office for Partnerships, the World Bank and several other organizations. It calls for action to identify what progress means in the 21st century and to stimulate international debate, based on solid statistical data and indicators. The Istanbul Declaration urges “statistical offices, public and private organizations and academic experts to work alongside representatives of their communities to produce high-quality, facts-based information that can be used by all of society to form a shared view of societal well-being and its evolution over time.

In November 2007 an international conference entitled “Beyond GDP. Measuring progress, true wealth and the well-being of nations” was held in Brussels, organised by the European Commission in partnership with the European Parliament, the OECD, the Club of Rome and the WWF. The European Union is now developing an indicator that would measure environmental progress and also use integrated accounting and other sub-indicators in order to improve policy-making. A preliminary version is due to be operational by 2009. The initiative is linked to the Global Project launched by the OECD at the Istanbul World Forum where a call was made on the need for international indicators to measure the progress of societies.

B. Initiatives at the national level – examples from different countries

Not only international organizations have been looking into the development of alternative indicators, reflexion in this respect has also taken place at the level of individual countries. In what follows are some examples.

Australia

Over the past 10 years there have been many different initiatives at the national, regional and community level in Australia aiming at the development of alternative indicators. The Australian Bureau of Statistics released the 4th edition of Measures of Australia's Progress (MAP) in May 2006 and worked to move towards a "capital" approach that would allow the assessment of sustainability as well as progress. The 2nd edition of `Summary Indicators 2007` (August 2007) provides a national summary of the most important areas of progress and presents them in a way which can be quickly understood by all Australians. This release focuses on 14 headline dimensions of progress and their headline indicators. The purpose of is to inform and stimulate public debate and encourage all Australians to make own assessments when contemplating progress.

Canada

Statistics Canada (Canada's National Statistical Agency) does play an effective role in collecting, developing and analyzing data that are instrumental in the work of research institutes on producing composite indicators of wellbeing and societal progress; it produces reports and publication that shine a light on important social, environmental and socio-economic issues.

The Canadian Index of Well-being (CIW)

One of the most well-known national indicator programs outside the Government is the Canadian Index of Well-being (CIW) which was initiated by the Atkinson Charitable Foundation and the GPI Atlantic to develop measures, to monitor Canadian well-being on an ongoing basis and assess the sustainability of societal well-being. The CIW covers 7 domains: living standards, healthy population, time allocation/balance, eco-systems health, educated populace, community vitality, civic engagement/governance. Its first release was in the autumn of 2006. The new index integrates Canada's economic reality with information on the social, health and environmental conditions.

The Canadian Sustainability Indicators Network (CSIN)

It is a network based on the “communities of practice” approach - where new and experienced practitioners can share lessons learned on sustainability measurements and tools by discuss relevant issues of theoretical, strategic, technical and practical importance. Since the inception of the network in 2003, CSIN has grown to over 800 practitioners working in a variety of academic, government, private sector and non-governmental organizations. CSIN is helping to facilitate greater collaboration and inform experts by linking people at the national, provincial, regional and

local levels in Canada and around the world.

France

French President Sarkozy's announcement in January 2008, to establish a commission to investigate alternative measures of economic performance and social progress for France, is particularly important because it demonstrates that interest in this work has now reached the very highest levels of government. Chaired by Joseph Stiglitz, the commission includes several Nobel laureates and is being advised by Amartya Sen. The Commission on the Measurement of Economic Performance and Social Progress is based on increasing concerns about the adequacy of current measures of economic performance, about the relevance of these figures as measures of societal well-being, as well as measures of economic, environmental, and social sustainability. The OECD takes part in this commission. A provisional draft summary of the Commission's work open to comments from the civil society has been published in the beginning of June 2009.

Ireland

The report "Measuring Ireland's Progress 2007" published by the Central Statistics Office Ireland shows the progress made in Ireland in important economic, social and environmental areas. As well as showing developments over time, the report benchmarks the situation in Ireland against the other EU member states.

United Kingdom

The centre for well-being at the New Economics Foundation (nef) aims to enhance individual and collective well-being in ways that are environmentally sustainable and socially just. Its aim is to promote the concept of well-being as legitimate and useful aim of policy and to provide individuals, communities and organisations with the understanding and tools to redefine wealth in terms of well-being.

While sustainable development policy and indicators have long been established in the UK, in 2005 a growing interest in looking at well-being and happiness began. In fact, in the sustainable development strategy of 2005 there was a commitment by the government to support research on how policies might change with a well-being focus.

Regional versions of the UK Government's indicators of sustainable development were first published in December of 2005 to help in providing a perspective of sustainable development in each region. They have been updated yearly and the last one has been published on 31st January 2008.

USA

Interest in a common approach to measuring national progress has been mounting in the United States over the past years. Hundreds of communities, cities and regions across the US have already developed key indicator systems.

'The State of the USA' is a non-profit institution assembling a set of key indicators that measure specific conditions or trends in order to educate the Americans about the progress of the United States, encourage an enriched civic dialogue and support more informed public decision making.

Switzerland

The Swiss Federal Statistical Office has been working on a set of indicators called Quality of Life which includes indicators on social and economic aspects of life. The set measures life satisfaction, work burden, economic situation, social participation and leisure. The long-term objective is to provide a comprehensive system of indicators covering both societal and individual well-being.

In order to monitor sustainable development, the Swiss Federal Statistical Office (SFSO), the Federal Office for Spatial Development (ARE) and the Federal Office for the Environment (FOEN) developed the indicator system MONET. It aims at providing international comparisons on the

social, economic and environmental situations and trends. The simplified form of this system consists of 17 indicators. Drawing on more than 100 indicators, this monitoring tool permits regular reporting on the status and progress of sustainable development and represents a guidance in the political decision making progress.

2. Overview and Methodology of a variety of alternative indicators

In what follows, the paper gives an overview of different indicators that should correct or replace GDP, according to their level of complexity. The methodology applied for each indicator is briefly outlined.

A. Indicators linked to welfare produced by National Accounts

The well-being of individuals is typically better linked to their current and future consumption of economic resources rather than to economy-wide measures of production and income.

Specific indicators for the household sector are: disposable income, final consumption expenditure and actual final consumption. There is a strong cross-correlation between the levels of household measures and GDP per capita.

- Household's disposable income is a good approximation of their receipts available for consumption; it includes all income (compensation of employees, plus social transfer and net property income) less current transfers paid (such transfers include employer's social insurance contributions, employees' social insurance contributions, taxes on income, regular taxes on wealth, regular inter-household cash transfers and regular cash transfers to charities).

Moreover, national accounts distinguish two notions of consumption for households.

- Final consumption expenditure: consists in expenditures including imputed expenditures, incurred by resident households on individual consumption goods and services.
- Actual final consumption: is the value of the goods and services consumed by households, whether by purchase or by transfer from government units. It is derived from their final consumption expenditure by adding the value of social transfers in kind receivable.

B. Dashboards or Sets of Indicators

Indicator sets differ in a variety of ways. Most of the initiatives refer to individual countries (and to localities within them) as developed either by citizens and research groups or as part of the official statistical system.

- Example: Developed by citizens and research groups: Calvert-Henderson Quality of Life Indicators for the United States (The dimensions of life covered by the Calvert-Henderson Quality of Life indicators include: education, employment, energy, environment, health, human rights, income, infrastructure, national security, public safety, re-creation and shelter.)
- Example: Measures of Australia's Progress, developed as part of the official statistical system and published by the Australian Bureau of Statistics.

Other initiatives are however international, typically used to monitor how a range of political commitments are followed through with specific actions. Examples of this category are provided by several initiatives undertaken under the aegis of the UN system, whose indicators are typically tailored to the needs and priorities of the poorer countries.

- Examples include the indicator sets supporting the Millennium Development Goals and national sustainable development strategies.

A similar development also extended to developed countries, as in the case of the indicator sets agreed by countries members of the EU to monitor different types of strategies

- E.g. The EU Sustainable Development Strategy agreed in Gothenburg in 2001; and the

revised social protection and social inclusion processes adopted in the aftermath of the Nice 2000 Council.

The OECD also relies on indicators sets to regularly monitor the performance of OECD countries in a number of fields

- Social Conditions: *Society at a Glance, OECD Social Indicators* (Type of indicator: Set of indicators; Scope of indicators: General context such as national income per capita, age-dependency ratios, fertility rates, migration, marriage and divorce; Self-sufficiency such as labour market and education; Equity such as income distribution and poverty; Health such as health outcomes and policies; Social cohesion such as crime, suicides, volunteering, life-satisfaction)
- Environmental Conditions: *Key Environmental Indicators* (Type of indicator: Set of indicators; Scope of indicators: climate change, ozone layer, air quality, waste generation, freshwater quality, freshwater resources, forest resources, fish resources, energy resources, biodiversity)
- Economic Conditions: *Going for Growth Economic Policy Reforms* (Type of indicator: Set of structural policy indicators; Scope of indicators: product market regulation, human capital, labour markets, labour taxes, labour market policies)
- Key economic, social and environmental indicators: *OECD – Factbook – Economic, Environmental and Social Statistics* (Type of indicator: Set of indicators; Scope of indicators: population, macroeconomic trends, economic globalisation, prices, energy, labour market, science and technology, environment, education, public finance, quality of life, special focus 2007: migration)

The advantages of dashboards of indicators / sets of indicators: They highlight large differences between the average measures of economic performance and social conditions, and this in terms of both levels of various social indicators and how they change over time. These differences are especially evident when considering countries with medium- to high- levels of per capita income.

The disadvantages of dashboards of indicators / sets of indicators: They are not well-grounded in a theory of what makes up a “good life”; these selections are inevitably ad hoc, and partially contingent on the conditions of a specific place and time.

The richness of information given by dashboards is both their strength and their weakness. Providing large sets of indicators minimizes information losses and avoids mono-dimensional judgments on welfare comparisons over time or across countries. But there remains a strong demand for summary statistics gathering all these information in a single number allowing rapid analysis of variations in well-being across countries and over time.

One stream in the literature tries to do so in ways that retain consistency with national accounts. These attempts all start from standard GDP or other associated national accounts indicators and try to correct them for additional aspects.

C. Corrected GDP and Extended National Accounts

- Measure of Economic Welfare / Sustainable Measure of Economic Welfare (MEW / SMEW): (Nordhaus, W. and Tobin, J. (1973) “Is Growth Obsolete?” in *The Measurement of Economic and Social Performance, National Bureau of Economic Research, 1973*)

Starting point of their welfare measure is not GDP but rather household consumption. This indicator is corrected in two steps: Measure of Economic Welfare (MEW) is derived by subtracting from total private consumption a number of components that do not contribute positively to welfare (such as commuting and legal services) and by adding monetary estimates of activities that contribute positively to welfare (such as leisure or work at home). The second step converts the MEW in a “sustainable measure of economic welfare” (SMEW) that takes into account changes in total wealth. The SMEW measures the level of MEW that is compatible with preserving the capital stock, given the definition of the capital stock retained by the builders of the index.

- Index of Sustainable Welfare (ISEW): (Cobb, J. and Daly, H. (1989) *For the common good, redirecting the economy toward community, the environment and a sustainable future*, Boston, Beacon Press; Cobb, C. and Cobb, J. (1994) *The green national product*, Lanham, University Press of America)

The ISEW has much in common with the MEW or the SMEW but with two important additions: an evaluation of natural resources depletion, measured as the investment necessary to generate a perpetual equivalent stream of renewable substitutes; and the distribution of income. On the other hand, the SEW does not include any monetary evaluation of leisure time.
- Genuine Progress Indicator (GPI): (Talberth, J. Cobb, C. and Slattery, N. (2006) *The Genuine Progress Indicator 2006: a tool for sustainable development, Redefining Progress, Oakland CA*) was proposed in 1995 by the non-governmental organization “Redefining Progress”. ISEW and GPI are often presented as alternative names for the same index.
- Genuine Savings Indicator by the World Bank: (Everett, G. and Wilks, A., *The World Bank's Genuine Savings Indicator: A Useful Measure of Sustainability? Bretton Woods Project October 1999*)

This is a broader concept of savings than in traditional National Accounts including natural resources or capital and simple measures of human capital. Genuine Savings aims to represent the value of net change in the whole range of assets that are important to development: produced assets, natural resources, environmental quality, human resources, and foreign assets.

Genuine savings are defined as net savings (net gross savings minus consumption of fixed capital) plus education expenditures minus the consumption of natural resources (fossil energy, mineral resources and forest) and the monetary evaluations of damages resulting from CO₂ emissions. In 2005 the *World Bank* published the report “*Where is the Wealth of Nations?*” *Measuring Capital for the 21st Century*”, presents data for Genuine Savings for some 140 countries.
- Ecological Footprint: (Wackernagel, M. and Rees, W. (1995) *Our ecological footprint: reducing human impact in the earth*, New society publishers, Gabriola Island, BC)

This index is classified in the category of extended account approaches despite the fact that its results are not expressed in monetary terms. But this indicator shares with accounting approaches the idea of reducing heterogeneous elements to one common measurement unit. The common unit used by the Ecological Footprint is the surface of habitable land requested to support current standards of living of the various countries. The Global Footprint Network initiated its National Footprint Accounts in 2003 with the most recent edition in 2008.
- Sustainable National Income (Roefie Huetting, *Introduction to the theory of eSNI, a macro indicator for sustainable development, Paper presented for the OECD World Forum on Statistics, Knowledge and Policy, “Measuring and Fostering the Progress of Societies”, Istanbul 27-30 June 2007, round table session “sustainable development”*)

Environmentally sustainable national income (eSNI) is defined as the maximum attainable production level by which environmental functions remain available for ever (based on the technology available at that time). SNI provides information on the distance between the current and the sustainable situation. In combination with the standard National Income (NI), the eSNI indicates whether or not the part of the production that is not based on sustainable use of the resources, is becoming smaller or increasing.

In the theoretical basis for the calculation of sustainable national income, the environment is defined as the non-human-made physical surroundings on which humanity is entirely dependent. Producing is defined, in accordance with standard economic theory, as the

adding of value. This value is added to the elements of our physical surroundings, so the non-human-made physical surroundings fall outside the standard National Income. As long as the use of an environmental function does not hamper the use of another or the same function, an insufficiency of labour is the sole factor limiting production growth. The estimated costs of measures necessary to restore functions, that rise progressively per unit of function restored, can be seen as a supply curve. It is not possible to construct a complete demand curve, but expenditure on compensation of loss of function and restoration of physical damage resulting from loss of environmental function constitute revealed preferences for environmental functions. When assuming absolute preferences for sustainability, the unknown demand curves must be replaced by physical standards for the sustainable use of the environment. Applying this approach the distance to sustainability denoted in physical units can be translated to monetary terms.

A trend analysis of the Sustainable National Income has been calculated for the Netherlands over the period 1990 – 2000.

D. Composite Indexes

To fill the needs of users for a comprehensive index allowing a synthetic analysis of trends in social conditions within countries and comparisons between countries, there is an alternative procedure that has proved much easier to implement and less demanding than pricing and valuation within the national account framework. The composite indicators approach consists in aggregating several elementary indexes to encompass a broad spectrum of dimensions.

- Human Development Index (HDI) by the United Nations Development Programme in 1990:

It measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, knowledge and a decent standard of living. It is calculated for 177 countries. In addition human development indicators are presented for another 17 UN members countries for which complete data was not available.

- The Index of Social Health (ISH) for the USA (*Miringoff, M., Miringoff, M.L. and Opdycke, S. (1999), The Social Health of the Nation: How America is Really Doing, New York: Oxford University Press*)

During the 1990s, several academics extended the HDI's methodology to broader aspects of development and welfare. The Index of Social Health aims to provide a comprehensive view of social health looking at problems that affect Americans at various stages of their life – childhood, youth, adulthood, and the elderly – as well as problems that affect all ages. The ISH is based on sixteen social indicators, grouped by ages: infant mortality, child poverty, child abuse, teenage suicide, teenage drug abuse, high school dropouts, unemployment, wages, health insurance coverage, poverty among the elderly, out-of-pocket health costs among the elderly, homicides, alcohol-related traffic fatalities, food stamp coverage, affordable housing, and income inequality. This index highlights the growing divergence from GDP since 1970.

- Personal Security Index (PSI), applied in Canada, and BIP40, applied in France: both indexes are similar to the Index of Social Health. They were developed in 1998 and 2002 in order to describe social conditions.

The PSI measures changes in both, empirical data and in people's perceptions of their personal security. It is a tool to measure well-being and it combines both objective and subjective indicators. Each index is made up of a series of indicators tracking various dimensions of the economic security, health security and physical safety.

The BIP40 aims at revealing society's tendencies towards more or less inequality and poverty. This index comprises dimensions such as unemployment rate, income distribution, deportation etc. and aggregates the normalized indicators in one index.

- Environmental Sustainability Index (ESI) and Environmental Performance Index (EPI) (*Estes, R., Levy, M., Srebotnjak, T. and de Shrebinin, A. (2005) 2005 environmental sustainability index: benchmarking national environmental stewardship, New Haven: Yale Center for Environmental Law and Policy*)
Since 2000 researchers from Yale and Columbia applied the same methodology to focus on environmental matters. The ESI aggregates 76 variables into 21 intermediate indicators, such as air and water quality, waste reduction and greenhouse gas emissions. The EPI is a reduced form of ESI, based on 16 indicators and is more policy oriented: as such, values are scaled according to pre-established policy targets, instead of sample observed data.
- The Index of Economic Well-Being (IEWB) (*Osberg, L. and Sharpe, A. (2002), An index of economic well-being for selected countries, Review of Income and Wealth, September*)
The index covers simultaneously current prosperity (based on measures of consumption), sustainable accumulation, and social topics (reduction in inequalities and protection against social risks). Environmental issues are addressed by considering the costs of CO₂ emissions per capita. Consumption flows and wealth accumulation (defined broadly, to include R&D stock, a proxy for human capital, and the costs of CO₂ emissions) are evaluated according to National Accounts methodology. Inequality is monitored with a Gini index and a measure of poverty intensity (Sen-Shorrocks-Thon index).
- Happy Planet Index (*Marks, N., Abdallah, S. and Simms, A., The Happy Planet Index, An Index of human well-being and environmental impact, nef 2006*) from the New Economics Foundation (nef), launched in 2006, combines environmental impact with individual well-being in order to measure the environmental efficiency. Nef's report, *The Happy Planet Index: An index of human well-being and environmental impact*, published in association with Friends of the Earth. The Happy Planet Index (HPI) strips the view of the economy back to its absolute basics: what is put in (resources), and what comes out (human lives of different length and happiness). In order to estimate the HPI, life expectancy, happy life years (ratings of life satisfaction are multiplied by mean life expectancy at birth) and the ecological footprint (measures how much land area is required to sustain a given population at present levels of consumption) are calculated.
- Quality-of-Life Index (*Economist Intelligence Unit's (EIU) quality of life index : the World in 2005*)
The index has been calculated for 111 countries for 2005. Life-satisfaction surveys are the starting point; their results are used for deriving weights for the various determinants of quality of life across countries, in order to calculate an objective index. The average scores from comparable life-satisfaction surveys are related in a multivariate regression to various factors that have been shown to be associated with life satisfaction in many studies. As many as nine factors survive in the final estimated equation. Together these variables explain more than 80% of the inter-country variation in life-satisfaction scores. The coefficients from the regression are used to derive the weights of the various factors; the most important were health, material well-being, and political stability and security. The values of the life-satisfaction scores that are predicted by our nine indicators represent a country's quality-of-life index.
- Advanced Quality of Life Index (*Diener, E. Assessing Subjective Well-Being: progress and Opportunities, Social Indicators Research, vol. 31, pp. 103-157*)
Here subjective well-being enters synthetic indicators that combine subjective and objective measures from a number of domains. This indicator includes both subjective/qualitative indicators and objective/quantitative indicators (physicians per capita, savings rate, per capita income, subjective well-being, college enrolment rate, income inequality, environmental treaties signed). This index is particularly relevant for developed countries (while the Basic Quality of Life Index, based on quantitative indicators, is more relevant for developing countries).

- Happy Life Expectancy Index (Veenhoven, R. (2007) *World Database of Happiness, Distributional Findings in Nations*, Erasmus University Rotterdam)
(Veenhoven, R., *Happy Life-Expectancy: A comprehensive measure of quality of life in nations*, in: *Social Indicators Research*, 1996, Vol. 39, pp. 1-58)
This index aims to be a proxy measure of well-being in nations. It combines estimates of life-expectancy (objective measure) with subjective life satisfaction (subjective measure) in the form of the product of two variables. Life expectancy in years is multiplied by average happiness on a 0-1 scale. The Happy Life Expectancy can be interpreted as the number of years the average citizen in a country lives happily at a certain time. The index has been computed for 48 nations in the early 1990s.

E. Subjective Approaches

This type of approach to measuring social conditions is based on measures of subjective well-being (SWB). Individuals are asked questions like “All things considered, how satisfied are you with your life in general...?”. Taking the answers to this question as proxies for subjective well-being, it is then possible to define indicators based on the mean, the median, or the variance of the distribution.

The subjective well-being approach is valid under the conditions that the respondents are able to evaluate their life on a numerical scale and have no difficulty in answering. Second, that they understand the question in a similar way. Third, that they use the same scale.

(See also: M. Fleurbaey, *Beyond, GDP, Is there Progress in the Measurement of Individual Well-Being and Social Welfare? August 2008, Notes on the Theory*" prepared for the first plenary meeting of CMEPSP)

- Subjective well-being and Income (Ferrer-i-Carbonell, A. (2005) *Income and well-being: An empirical analysis of the comparison income effect*, *Journal of Public Economics*, vol. 89, pp. 997-1019) Ferrer-i-Carbonell relates general satisfaction with life and income using micro-panel data drawn from the GSOEP (German Socio-Economic Panel). Each individual is compared to a reference group that contains all the individuals with a similar education level, the same age bracket, and living in the same region. Main results: Income has a small but significant effect on individual well-being. The impact of income on individual well-being is larger for the poorer. Increases in family income accompanied by identical increases in the income of the reference group do not lead to significant changes in well-being.
- Satisfaction in other domains: Beyond general satisfaction with life, individuals are able to distinguish between various domains of life and to evaluate their satisfaction for each of these: job, health, housing, leisure, social life.
 - Satisfaction with job: (Clark, A. and Postel-Vinay, F. (2007), *Job Security and Job Protection*, *Oxford Economic Papers*, forthcoming.) Overall job satisfaction is strongly correlated with all of the job outcome variables. Variables: pay (objective measure and subjective measure), hours of work (objective measure and subjective measure), future prospects-promotion and job security, how difficult is the job, job content (interest, prestige, independence), interpersonal relationships)
 - Calculation of monetary equivalents of noise pollution: Van Praag, B. and Baarsma, B.E. (2005), *Using happiness surveys to value intangibles: the case of airport noise*, *Economic Journal*, vol. 115, pp. 224-246.
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- Inequality-Adjusted Happiness (IAH) (Veenhoven, R. (2007) *World Database of Happiness, Distributional Findings in Nations, Erasmus University Rotterdam*) (Kalmijn, W. and Veenhoven, R., *Measuring Inequality of Happiness in Nations*, in: *Journal of Happiness Studies Special Issue on 'Inequality of Happiness in nations'*, 2005, vol. 6, pp. 357-396)

IAH is an index which denotes the degree to which a country combines a high average level of happiness with low inequality in happiness. The index gives equal weight to level and inequality of happiness. It is a clear combination of the mean happiness value and the standard deviation, expressed as a number on a 0 to 100 scale. It was applied to 90 nations for the 1990s and observed large and systematic differences, IAH being higher in rich, free and well-governed countries.

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