COMMISSION ON THE MEASUREMENT OF ECONOMIC PERFORMANCE AND SOCIAL PROGRESS

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ISSUES PAPER

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INTRODUCTION

There is a huge distance between standard measures of important socio economic variables like growth, inflation, inequalities etc…and widespread perceptions; the gap is so large and so universal that it cannot be explained by reference to money illusion and/or to psychological characteristics of human nature. Our statistical apparatus, which may have served us well in a not too distant past, is in need of serious revisions.

Reflecting this concern, the President of the French Republic has decided to create a Commission on the Measurement of Economic Performance and Social Progress (CMEPSP, also called "the Commission" in the following text). As its name suggests, its focus is on the measurement of economic performance and social progress. Currently, the most widely used metric is GDP (gross domestic product.) Its aim is to identify the limits of GDP as an indicator of economic performance and social progress, to consider additional information required for the production of more relevant indicators, to discuss how to present this information in an appropriate way, and to assess the feasibility of alternative measurement tools.

Indeed, for a long time there have been increasing concerns about the adequacy of current measures of economic performance, in particular those based on GDP figures. Moreover, there are even broader concerns about the relevance of these figures as measures of societal well-being. The inadequacies of these figures from the perspective of *sustainability*-- economic, environmental, and social sustainability-- has been of particular concern.

There may be several explanations for the gap between the statistical measurement of socio-economic phenomena and popular perception of the same phenomena:

- The statistical *concepts* may be correct, but the measurement process may be imperfect.
- There may be conceptual flaws. Our statistics may not be capturing some phenomena, which have an increasing impact on the well-being of citizens. For instance, if citizens are concerned about the quality of air, and air pollution is

increasing, then statistical measures which ignore air pollution will provide an inaccurate estimate of what is happening to citizens' well-being.

- The increase in inequalities reduces the relevance of statistical averages. In such a situation, GDP *per capita* does not provide a fair account of the situation in which most people find themselves. Nobody recognizes himself in an average figure. For instance, changes in food prices do not have the same impact on the economic situation of the poor and the rich.

The Commission wants to address these and related issues in a systematic and concrete way. While the Commission recognizes that it cannot claim to be exhaustive, some of the failures in the current statistical framework are more important than others. Issues will be prioritized according to their estimated impact on our measurements. Moreover, the Commission intends to test empirically the feasibility of proposed alternative measurements. The secretariat of the Commission, in cooperation with national and international statistical institutions, will conduct "exercises," not only to ascertain the feasibility of the revised methodologies, but also to provide an estimate of the empirical significance. At the beginning the Commission has decided to select France and the USA as candidates for experimental computation of proposed indicators.

One outcome of the Commission's work will be suggestions for alternative indicators which may provide a better description of economic performance and social progress. Taking stock of similar work conducted in the past, the Commission will be cautious about the number of indicators proposed. Here, as elsewhere in economics, there are trade-offs: a larger number of indicators may better reflect the diversity of issues and individual situations, but an excessively large number may provide a confused picture of the overall situation. On the other hand, a single figure mixing a large number of socio-economic phenomena provides an inadequate basis for appropriate policy measures.

Any statistical indicator has to aggregate variables that are, in some sense, incommensurate. In estimating GDP, we add up apples and oranges; and we aggregate them together using *relative* prices. If an orange sells for twice the price of an apple, then each orange is counted as two apples. The justification of this is that *in competitive*

markets, relative prices reflect marginal relative valuations. An orange is valued by *all* consumers as "worth" twice as much as an apple. While even in market transactions, this assumption may be questioned (for instance, when markets are imperfect), when moving *beyond* GDP to areas where there are limited or no market transactions, the relevance of a *monetary* metrics becomes more questionable. The choice of alternative metrics has to be assessed both from a conceptual and practical point of view.

To organize its work, the Commission selected three main directions of study which correspond to three of the already identified main causes of divergences between perceptions and measures. (i) *Classical GDP issues.* Limits of GDP as an indicator of socio-economic progress or economic performance can be addressed by investigating possible extensions or modifications of the current conceptual framework; (ii) *Sustainable development and environment.* As we have noted, one of the biggest concerns about current measures of economic performance and social progress is related to sustainability and one of the areas where sustainability is most questioned is the environment; (iii) *Quality of life.* This direction of study is covering the measurement of social progress taking into account broader perspectives on *well-being,* including metrics derived from asking people how they themselves feel.

The present issues paper is accordingly structured into three chapters based on the work of three working groups created by the Commission on the occasion of its first plenary meeting[4]:

- Classical GDP issues
- Sustainable development and environment
- Quality of life

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[4] The organization of work by the Commission is described in Annex.

1. CLASSICAL GDP ISSUES

GDP is a measure of production, not of well-being

Gross domestic product is mainly a measure of *market production and economic activity* within a country. Indeed current metrics originated out an attempt to monitor market production, following the development of Keynesian economics. But GDP is not a measure of economic well-being. There are several reasons why this is the case, and addressing some of them will help us move from the standard GDP measure to measures that are closer to being indicators of how well off people are. That having been said, metrics derived from national accounts will never provide a comprehensive indicator of well-being.

The aims of the proposals below are relatively modest: first, examine how measures of *household income* rather than GDP can inform us about the standard of living. As we noted earlier, given the high and rising levels of inequality in our society, attention needs to be addressed to how *real household incomes* compare across different groups of the population and across regions and countries and the *rate of change* of income for each of these groups. The latter reflects the evolution of purchasing power of the population between periods, the former its distribution between different groups of persons. Attention will also be paid to supplementary measures of income not normally covered in the national accounts, in particular the value of non-market services produced by households. Because standards of living depend not only on income flows but also on stocks of wealth, we need to consider how wealth and, especially, changes in wealth should be treated in our indicators. Questions of sustainability, of the quality of life, and of people's subjective perception of how well they are doing are considered in the following two chapters.

Disposable income is a good start to measure the purchasing power of countries and households…

GDP is the *gross amount of goods and services produced within a country in a year (or a quarter).* No account is taken of depreciation of capital goods, depletion of natural resources, or the degradation of the environment. If a large amount of output produced has to be

set aside to renew machines and other capital goods, society's ability to consume is less than it would have been if only a small amount of set-aside were needed. Thus, an immediate adjustment to GDP is to account for depreciation; doing so, one obtains a measure of *net domestic product (NDP)*. The reason that economists have relied more heavily on GDP than on NDP is, in part, depreciation is hard to estimate. True economic depreciation is the change in the value of the machine as a result of its wearing out and the shortening of its future lifespan; but most businesses use a simple rule of thumb: cars wear out on average in ten years, so each year depreciation is estimated to be one-tenth of the value of the car. When the structure of production remains the same, GDP and NDP move closely together. We know that GDP overestimates net output, percentages changes in GDP provide a good metrics of changes in NDP. But in recent years, the structure of production has changed dramatically. Manufacturing has declined, while IT has increased. Life expectancy of computers and software is shorter than of steel mills. Thus the discrepancy between GDP and NDP may be increasing.

Of even greater concern for some countries is that the standard measures of NDP have not taken into account the depletion of scarce natural resources or the degradation of the environment-natural assets, the importance of which we are increasingly recognizing. In some countries where mining is important, a large new mine will indicate big increase in GDP, but once one takes into account the degradation of the environment and the depletion of natural resources, NDP may actually be lowered. We refer to GDP or NDP where account is taken of resource depletion and environmental degradation as *green GDP* or *green NDP.*

Some of the income generated by residents is however sent abroad, and some residents receive income from abroad. Consequently, a second adjustment to GDP, in our search for a measure of available income, is to account for international transfers. The resulting measure is net national income NNI. This too is a standard variable in countries' national accounts.

With globalization and the shift from manufacturing to services, the differences between GDP and NNI have increased. It is important to know the extent to which this is so, and how it affects the judgments of relative economic well-being. Assume, for instance, that more and

more production occurs inside a country by firms owned abroad. While the profits are included in GDP, these profits do not enhance the spending power of the citizens of the country. For a poor developing country to be told that its GDP has gone up may be of little relevance. It wants to know are its citizens better off. This is especially the case in those countries relying heavily on mining or oil, where the country may receive a small royalty, and most of the returns accrue to the multinational mining or oil company.

The total real income which residents derive from production depends also on the rate at which exports may be traded against imports from the rest of the world. This is a standard aggregation problem, of the kind that we have noted earlier. The problem is that exchange rates changes have been large, and often do not track changes in purchasing power. There are, as a result, marked discrepancies in comparisons (both across countries and over time), but forming purchasing power parity (PPP) estimates remains controversial.

Taking these changes in relative prices into account, along with real international transfers and real depreciation yields a measure of real net national income for the entire economy.

National income can be computed for the economy as a whole but also for private households. Some of the income of citizens is taken away in the form of taxes. This is money that is not at their disposal. But the government takes this money away for a reason: to provide public goods and services and to transfer income to other (normally more needy) individuals. Thus other households receive transfers from government, and all households receive benefits. A commonly employed measure adds and subtracts these transfer payments, but makes no adjustments for the value of the goods and services provided by the government. The resulting measure is referred to as a measure of disposable income for households. It is, however, a rather flawed measure-a peculiar measure that may be of limited usefulness in making certain comparisons either over time or across countries. Assume, for instance, that all individuals in society buy private retirement insurance that will provide retirement income equal to 80% of their average wage. They pay an annual premium for the insurance equal to 10% of their current income. 10% of the premium goes to pay transaction costs. Now, assume that the government decides to provide the same amount of retirement insurance to

everyone, funded through a 10% tax. Assume the population is growing, so that there are many more "contributors" than recipients. Nothing has changed, other than the government is now collecting the insurance premium and distributing the benefits; but according to the statistics, disposable income may have fallen considerably. If the government is more efficient, and there are lower transaction costs and it takes no profits, the statistics can show a fall in current disposable income, though clearly society is better off.

…and distributional aspects can be incorporated

Average disposable income per person is helpful but gives no indication about how available resources are distributed across persons or households. For example, income per capita can remain unchanged while the distribution of income becomes less equal. It is therefore necessary to look at disposable income information for different income groups. A simple way of capturing distribution aspects is to measure *median disposable income,* the income such that half of all individuals are above that income, half below. With increasing inequality, there may be increasing differences between median and average income; a focus on average income does not give an accurate picture of the economic well-being of the 'typical' member of society. Evidence for certain countries, e.g., for the United States shows that median household income as a share of mean income fell over the past years, signaling a widening of the income distribution.

A second step towards bringing demography and some distributional aspects into income measures is to follow disposable income *per consumption unit* or per household rather than per person. Consumption units are households with an adjustment for their size so that account is taken of the fact that there are fixed costs to running a household. This adjustment is of increasing importance as the size of household units changes. For example, in France real disposable income per person rose at 1.6% per year over the period 1974-06, real income per consumption unit rose at 1.3%. Work by the OECD has shown that differences can be even more important in other countries.

In all the measures we have calculated, we have taken into account changes in prices over time. We do not just measure "money

income". Statistical agencies calculate the increase in prices by looking at what it costs to purchase an average bundle of goods. The problem is that different people buy different bundle of goods. Poor people spend more on food; rich on entertainment. When all prices move together, having different indices for different people may not make much a difference. But recently, with soaring oil and food prices, these differences have become marked. Those at the bottom may have seen real incomes fall by 50% or more, while those at the top may have seen real incomes hardly affected. A price index for (actual) private consumption for major groups in society (age, income, rural/urban) is necessary if we are to appraise their economic situation. Such indices are not readily available in most countries but could be made available at moderate costs. Their development should constitute a medium-term research objective.

While the problems that are involved in constructing good indices are well understood, the rapid changes in relative prices and economic structures have meant that conventionally constructed price indices may by seriously flawed. For instance, the Boskin Commission in the U.S. concluded that inflation may be overstated by as much as percentage points, implying that real growth was understated by an equivalent amount. Among the issues to which it called attention were problems associated with adjustments for quality changes and appearance of new products (particularly relevant in fast changing sectors like health and IT, but also in retailing); and problems associated with the collection of data, in an era where an increasing fraction of sales are done over the internet and at sales as well as discount stores. Moreover, following revisions of international guidelines, the U.S. and several other OECD countries have shifted, in their construction of GDP measures, to chain weighting, which can result in marked differences in GDP estimates relative to conventional fixed weight metrics.

Improving the measurement of health, education and other non-market services…

Work has started on health and education

Many European countries as well as Australia and New Zealand have started to develop output-based measures for non-market services. Effects can be important. For example, with output-based measures, the U.K. economy grew at the rate of 2.75% per year between 1995 and 2003, whereas if the old convention had continued to be used, the growth rate would have been 3% (Atkinson 2005). Health and education are the most obvious government-provided services. But there are others, such as security, or the provision of amenities, and not taking them into account can distort comparisons of the standard of living across countries and over time. For example, if governments seize to provide public parks, taxes may go down, leading to an increase in disposable income and yet, well-being may have been negatively affected. Much remains to be done, however, by way of developing reliable methods and data to capture such effects.

In many countries, households obtain goods and services not only through market purchases but also as transfers in-kind or at greatly reduced prices from government. By far the largest such items are health and education services. Citizens also enjoy the services of goods and services that are publicly provided to all citizens - parks, firefighting services, social insurance programs, and national defense. Some of these services are akin to those that individuals purchase, or could purchase, for themselves, so that there is, in principle, clear criterion for evaluation. We focus here on education and health.

Typically, in the public sector, we use volume measures based on the *inputs* used to produce these services rather than on the actual outputs produced. For example, the number of nurses may be used to measure the volume of medical care, thereby ignoring changes in the quality and productivity with which the services are provided. The private sector has an equally serious problem. It values the service at the price paid, and this may not adequately reflect changes in quality. The mirror image of a biased volume measure is a biased price index for these services. Of course, if price and volume measures of health and education services are wrong, so is the measure of real disposable income mentioned earlier. For example, if the quality of medical care increases but this is not reflected in a higher volume measure of medical care, our measure of real income

will be underestimated and vice-versa if medical care quality has declined. Similarly, if the provision of health services is less efficient in one country than in another, measuring the quantity of health services by inputs may grossly distort comparisons of economic well-being. The U.S. spends more per capita on health care, and yet in terms of standard health indicators, health outcomes are worse than in many European countries. At least some of the differences between income in America and income elsewhere may be attributed to these measurement problems, and it is important to know how much. This leads to the next research proposal: develop improved and output-based measures for prices and quantities of health and education services and assess the magnitude of the adjustment to standard GDP measures.

...and considering wealth

Income flows are an important gauge for the standard of living but wealth also determines how well off people are. Although the information about household wealth is in principle available from national accounts balance sheets it is often incomplete. Furthermore, certain assets are not recognized as such in the standard accounting framework. A particular important one is human capital. Those studies that computed human capital stocks found that they account for an overwhelming part (80% and more) of all wealth. A systematic measurement of human capital stocks is of interest from a number of perspectives. It constitutes an integral part of an extended measure of household production (see below), and it is a central input for the construction of sustainability indicators.

Just as the best indicator of the status of a firm is its balance sheet, so too for the economy. To construct the balance sheet of an economy, we have to have comprehensive accounts of its assets (human, physical, and natural capital - and perhaps even social capital) and its liabilities (what is owed to other countries.) To know what is happening to the economy, we need to ascertain changes in wealth. In some instances, it may be easier to account for changes in wealth than to estimate the total value of wealth. Changes in wealth entail gross investments (in physical and human capital) minus depreciation and depletion (of physical, human, and natural capital.)

Price changes in assets such as residential dwellings or shares are not considered part of income in a national accounts sense. They are revaluations of assets, not revenues from production but this does not change the fact that many persons (and not least tax authorities) *do* consider capital gains a form of income that influences the behavior of households and corporations and their economic well-being. There are thus good reasons to believe that capital gains and losses should be considered in measures of economic well-being. In all probability, such extended income measures would exhibit greater volatility than the unadjusted measure. It may also be the case that the consideration of capital gains and capital losses would unevenly affect different income groups. For example, large capital gains or losses in shares would be proportionately more important for upper income groups – another field for research and numerical assessment. Here again, there are important conceptual problems. For example, in some countries, assets are increasingly held in individual retirement accounts (to which individuals have only limited access until they reach a certain age). Should the increase in share values be attributed back to individuals? And how should defined benefit schemes be accounted for?

Non-market production by households

Production and income measured in the national accounts do not include the many service activities that households undertake for themselves such as cleaning, cooking, childcare, driving to work and so on. In principle, the time spent on these productive activities can be measured, valued and integrated with the traditional national accounts and income measures. Past studies have shown that household services make up a large source of in-kind production and their consideration is likely to change the measured level, distribution and growth rate of household disposable income. A study for Germany and Finland (Rüger and Varjonen, 2008) showed that the unmeasured household production corresponds to between 30 and 40% of traditional GDP – a considerable amount. Problems of valuation methods remain, however, as well as the question how to draw a clear distinction between the production aspect and the consumption aspect of certain activities. For example, it may not be possible to distinguish between cooking for pleasure and cooking as a home provided service.

A more complete picture of household production activity could be drawn by recognizing a full set of accounts for households. Such an endeavor would not only consider the household services mentioned above but also include education as an investment, increasing the magnitude of human capital. Comprehensive accounting would, of course, have to take account of the depreciation of human capital, e.g. as a result of aging. Early studies in the United States (Jorgenson and Fraumeni 1989) that used such a comprehensive measure of productive activity found that the resulting numbers exceeded by far the figures as conventionally measured: for example, investment in human capital turned out to be at least four times investment in non-human capital.

What about the value of leisure?

Once one starts thinking about non-market income, one has to think about leisure. With time spent on generating income (market or non-market) we buy goods and services to meet our needs or for simple enjoyment. Time spent to leisure is another input necessary to well-being. Changes in the amount of leisure over time and differences between countries represent one of the more important aspects of well-being. Focusing only on goods and services can therefore bias comparative measures of well-being. It is, however, difficult to put a monetary value on leisure. What is the value of an hour's walk in the park for one hour but it is easy to imagine that such evaluations are difficult to put in place, let alone integrating them systematically into a system of national accounts.

A different way of considering both the effects of the consumption of goods and service and leisure is by using a different metric – time. Krueger, Kahneman and other researchers have developed a system of national time accounting where information on how people use time is combined with information on the emotional experience during these activities. Certain activities concern household production, and other concern leisure and the national time accounting index is a way of bringing these elements together in a single measure…

Assessment of security

One of the important dimensions of well-being is security. Individuals are risk averse. That is why they are willing to pay insurance premiums exceeding the actuarial value of what they may get in return. There are changes in society which have changed individuals' degree of security. Increased economic volatility can increase insecurity,

publicly provided work programs or unemployment insurance can decrease insecurity. One of the principles of our system of accounts should be that a movement of an activity from the public to the private sector, or vice versa, should not change our measure of performance, except to the extent that there is an effect in quality or access. Assume the private sector provides disability insurance to a limited fraction of population, and makes profits in doing so. Assume now that the government provides publicly disability insurance, financing it through tax payments. Simple measures of disposable income for households would register a decline by the amount of increased tax payments, but not account for the in-kind services of the insurance provided by government. This problem is partially addressed with the use of a measure of *adjusted disposable income*[5] which accounts for social transfers in kind and is therefore neutral with regard to the measurement effects of a change between publicly and privately provided insurance, everything else being equal. However, if the ownership of an insurance company by the public sector increases accessibility to insurance services, this would go unnoticed even in adjusted disposable income. Moreover, if the financial services industry is not perfectly competitive (a reasonable assumption in most countries), the transfer of responsibility from the private to the public sector will be reflected in decreased profits. The "output" with public provision is, once again, measured by its input, with no value associated with the decrease in insecurity. In making comparisons between countries with public and private provision of various aspects of social insurance, there accordingly has to be an imputation with public provision for the value of "security services" provided.

These adjustments are particularly important in assessing the impact of social insurance contributions and benefits on real disposable income, as we previously noted. In some societies, health care or retirement benefits are funded privately; in others publicly. Payments in one case are treated as part of disposable income, in the other as a subtraction from disposable income. These can also give a distorted view of changes in real disposable income over time, if the relative reliance on the public sector changes over time.

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[5] Adjusted disposable income is part of the international System of National Accounts which provides the standard for OECD countries, including the countries of the European Union and - with some smaller differences - the United States.

It should also be noted that the neutrality of adjusted disposable income with regard to the public or private ownership of the provider does not apply for collective services (defense, security...). In this case, conventional accounting lowers all measures of disposable income by the amount of tax payments although societal well-being may have increased. The Commission will need to address the question of whether there are other areas of major public expenditures (besides social insurance) where some account should be taken of public provision, either in assessing changes in economic performance over time or across countries. One potential candidate is associated with the trend to privatize the knowledge commons. Knowledge which previously would have been freely available is now being charged for. GDP increases, but social welfare may be decreased, as a result of reduced access.

Treatment of 'defensive' expenditures

Expenditures required to maintain consumption levels could be viewed as intermediate inputs – there is no direct benefit. Thus, if societal violence increases, and more expenditures are required for police protection, it could be argued that the increased expenditure on police protection should not raise measures of income if those are used as welfare gauges. On the other hand, some expenditure in security can be seen like an investment good designed to enhance social capital, akin to health expenditures that can be seen as investment in human capital, R&D expenditures that are investment in knowledge capital or pollution abatement expenditures that can be conceived as investment in natural capital. From this perspective, it would not be meaningful to exclude the provision of investment goods from production and gross income. But, as we have noted, more meaningful measures of economic performance subtract off depreciation (including the depreciation of human capital). What appropriate adjustments are necessary for other forms of investment?

Future work

An outline of the main areas of future work on GDP-related issues is provided in Box 1 below.

Box 1. Areas of work to be addressed about GDP-related issues

1. From GDP to net real disposable income for the entire economy and for the household sector, taking account of depreciation, resource depletion, environmental degradation, transfers into and out of the country, and appropriate price indices, which reflect quality change and other aspects of our changing society.
2. Real disposable income per consumption unit for different income groups. Median versus average income.
3. Output-based measured of volume and prices for health, education, and other non-market services, including those provided by government.
4. Capital gains/losses and income.
5. Unpaid homework and income, including measurement of inequality.
6. Unpaid homework and leisure.
7. Education as an investment good to build up human capital, including investment and depreciation.
8. Assessment of security, especially when provided by the public sector.
9. Treatment of defensive expenditures, including public and private expenditures on security.

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2. SUSTAINABLE DEVELOPMENT AND ENVIRONMENT

Incorporating the environment in measures of economic performance: an old issue

Analysts have long recognized the need to take into account the incidence of human economic activity on exhaustible natural resources and on the environment. In the 1920s and 1930s, Hotelling, Ramsey and Pigou laid the analytical foundations. Renewed interest in optimal use of natural resources and preservation of the environment has, since the early 1970s (with the Meadows report), rekindled interest in the topic and there have been many proposals for measuring the environmental impact of economic activity. The

Brundtland report in 1987 and its promotion of the increasingly popular theme of "sustainable development" have spurred further the production of such indicators. Recent international conferences, such as the OECD June 2007 World Forum in Istanbul, and the EU conference *Beyond GDP* in November 2007, have offered widely publicized reviews of existing measures.

National accountants have been active in this movement, leading in particular to the definition of an ambitious framework, the System of Integrated Environmental and Economic Accounting. Some countries have started to implement this satellite accounting system and its use should become mandatory with the next revision of the SNA in 2010. Many proposals have also been made to move towards a concept of "green" GDP correcting GDP for the degradation of natural resources.

In spite of all this activity, at this stage, no single measure or set of indicators has gained widespread recognition, perhaps because of disagreements over conceptual foundations or the lack of the analytical simplicity that made GDP such a success in policy debates and in the public at large.

The questions of current well-being and of its sustainability are two distinct issues

Moving ahead requires a number of conceptual clarifications. First, one has to make a clear distinction between the impact of the environment on the measurement of *current* well-being and the question of *sustainability* stricto sensu, which is the question of our ability to maintain this current level of well-being in the future. Some indicators try to capture both dimensions at the same time, but this can contribute to confusion: a society or an individual both need to know how much they are consuming today and how much they need to save for their future consumption. Current well-being can be high but not sustainable. It may even be the case that sustainability can be reached only by accepting a reduction of the current level of consumption or well-being. It is obviously important to separate the two aspects.

How does the environment contribute to *current* well-being?

The first step is therefore to explore environmental aspects of *current* well-being. The task is to quantify the impact of all environmental variables that affect directly current well-being. Environmental degradation can also affect the costs of production, but such costs are already reflected in the value of goods incorporated in GDP. The list of such variables is potentially very long. It includes variables such as quality of air or water, noise, availability of space or the quality of landscapes. This does not only involve natural environment, but also our *constructed* or built environment. In the limit, the impact of "social" environment could be included under the same heading, although this question will be looked at more adequately in chapter 3 "Quality of life".

Integrating these items in indexes of current well-being will raise problems similar to those that will be faced in other areas of work of the Commission.

Let us take the quality of air as an example. One first step is to make an inventory of *physical measures* that are available to characterize this quality. Air is probably a domain where the list of available measures is the most comprehensive, but estimates, perhaps less satisfactory, can be obtained for other items.

A second step is to examine whether these characteristics can be converted in monetary terms (a money-metric of, say, the level or changes in air quality), allowing their incorporation in a global monetary measure of well-being. Hedonic studies of housing, for instance, may be able to show the value that citizens put on living in a community with cleaner air. Lower bound estimates to the value of clean air can be obtained by viewing clean air as an input into health, and valuing health impacts. Studies done in conjunction with assessing the benefits of higher clean air regulatory standards have provided estimates of such valuations. Contingent valuation techniques may be used as well.

If such a monetary conversion is impossible, either because the numbers are viewed as too speculative or because the underlying research to support the valuations has not yet been completed, do we nevertheless keep the objective of producing a single index of the

"composite" kind (using somewhat arbitrary weights, such as employed by the UNDP's Human Development Indicators) or do we rather propose a set of environmental indicators complementing the "core" measure of well-being?

A third issue is the question of *inequality* of access to air quality. Physical measures will generally have a strong dispersion over territory. What is therefore the meaning of a measure of *average* air quality? Do we aggregate measures obtained at different points on the territory, and if so, how? As we have noted, housing prices may reflect differences in air quality. Lower income individuals suffer from exposure to lower air quality, but benefit from lower housing prices. How do we combine these offsetting effects in assessing household well-being?

Lastly, we need to control for the risk of double counting. For instance, if it is essentially through health status that poor air quality affects current well-being, we do not need to add a variable measuring air quality in an index that already incorporates an *adequate* measure of health. What we have to evaluate in such a case are *pure* consequences of the environment that are not mediated by health status.

Sustainability viewed through the lenses of Net Adjusted Savings

Once current well-being has been assessed, how do we evaluate its sustainability? We can get a hint of an appropriate approach by returning to the earlier discussion of depreciation. We subtracted from GDP an estimate of the extent to which machines have depreciated. Over the life of the machine, had the depreciation allowances been set aside, a new machine could have been purchased, and production could have been sustained. Over the last few decades economists have generalized these ideas, focusing on the preservation of an "extended" capital stock. The idea is that future well-being will depend upon the availability of a mix of different production factors, including natural resources, physical capital and also human capital defined in a broad sense, i.e. not only the qualification of the labor force but also the set of social institutions that contribute to productivity (sometimes referred to as social capital).

The term of "net adjusted savings" has been proposed to label the variation of this stock of extended capital over time. It has been proven that sustainability in the sense of maintaining current levels of well-being requires that these Net Adjusted Savings to be non-negative. The World Bank has begun the systematic evaluation of this index; it defines Net Adjusted Savings (NAS) more precisely 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 CO_2 emissions. In 2000, the World Bank estimated a rate of net adjusted savings equal to 14.3% for France, compared to a rate of Gross National Savings of 22,0%. For the US, the corresponding figures were 8.2% and 17.4%.

This first approach already raises important measurement issues

Such computations go a significant way in the direction of a better assessment of sustainability, but need further examination.

First, the depletion of some natural factors (including the degradation of the environment) is only partially taken into account, because of lack of comparable data across countries. We now have relatively good data on carbon emissions, but data on other aspects of the environment is often lacking.

Secondly, prices used for valuating resource depletion and environmental degradation are often not adequate, and because these are not tradable commodities, relative prices may differ markedly across countries. This second problem occurs even for conventional natural resources when market imperfections alter the prices at which these natural resources are sold. Hence, markets may underestimate the price of exhaustible resources whenever there is a problem of commons or ill-defined property rights. There is no readily available market price for such dimensions of the environment/natural resources as the quality of soils (though soil quality may be reflected in farm prices or rental rates), the quality and quantity of ground water, or biodiversity, though all of these probably ought to be regarded as major ingredients of a sustainable economy.

Problems also arise concerning the measurement of human capital accumulation. Traditional metrics, focusing on years of schools or

expenditures on schooling, are clearly faulty, and may not be closely related to output measurements. Population growth poses, in addition, conceptual problems. We can think of people as an asset and a factor that can have an adverse effect on sustainability: a larger rate of NAS is required if we have to ensure sustainability of well being per capita to a more rapidly expanding population. At the same time, some would argue that there are intrinsic benefits to a larger population, or intrinsic costs (such as greater congestion).

Another issue in assessing sustainability is the measurement of current productivity and productivity trends (which can be embedded in a measure of Knowledge Capital). Exogenous growth in total factor productivity (TFP) is one possible way to gain sustainability. But sustainability may be overestimated if our estimates of TFP do not fully control for *all* productive factors that went into generating the productivity increases.

These considerations make it unlikely that we can construct a completely convincing and comprehensive measure of NAS in the near future. The Commission will have to consider whether the use of several partial metrics of NAS would be preferable to a single aggregate number, or could usefully supplement such a number.

Beyond weak sustainability

But this NAS approach also raises more fundamental issues.

One fundamental question about the NAS approaches concerns the degree of substitutability that they assume, explicitly or implicitly, between components of global wealth, and specifically between natural and other forms of capital. There is an assumption that it is always possible to compensate for natural resource depletion by a sufficiently high level of capital accumulation or technical progress. Most economists believe that this assumption is probably acceptable. As a natural resource becomes increasingly scarce, its price rises, inducing substitution away from that factor and innovation to find alternatives. However it does mean that natural capital such as biodiversity may be depleted substantially even in an economically sustainable world. For this reason, this approach is generally described as giving at best a criterion of "weak" sustainability, i.e. a

condition for sustaining human well-being but not necessarily certain aspects of the natural world.

Assessments of sustainability inevitably entail long run projections, with large changes, e.g. in supplies and demands of natural factors. Standard analyses typically make such projections using smooth and continuous functional forms for the various relationships (production and utility functions). If instead there are discontinuities and/or bifurcations in some processes, resulting for example in irreversibility, then the projections made by such models may go seriously awry. Examples of such possible non-linearity are the extinction of certain species, or bifurcation in the evolution of climate, such as the possible inversion of the North Atlantic Gulf stream. The Commission may attempt to explore alternative valuation techniques, or at least to provide indicators of the magnitude of such future risks.

More broadly, the Commission ought to address a whole range of issues deriving from uncertainty –of future knowledge and technological changes, of future resource discoveries, of preferences of future generations—and explore how metrics of these uncertainties might be incorporated in a meaningful way in indicators that are supposed to guide policy (e.g. policy based on "precaution principle").

The international dimension

The measurement of sustainability must be looked at both at the national and at the global level. The application of the NAS approach by the World Bank is made at the national levels; it enables developing countries to ascertain whether their growth path is sustainable. It provides a clear warning to those countries with negative NAS (there are about 30 such countries). Those who finance their current consumption with revenues from exhaustible natural resources may be in an especially precarious position.

But there is a slight inconsistency in this approach, because it takes into account each country's contributions to global warming as a producer. This is a *global* problem, and what any small country does will have a negligible affect. We need a global framework to assess the sustainability of the global system. Of course, in the future, if there are prices associated with carbon emissions, then individual countries

will have to take into account their carbon emissions in the assessment of the sustainability of their economic strategy.

It may be useful, however, to employ alternative approaches to assess each country's global impacts on the environment-- such as the popular "ecological footprint" index, which can take into account the ecological consequences of a country's *consumption.* Such an index emphasizes the sense in which inhabitants from developed countries contribute much more to the exhaustion of worldwide resources than those of exporter countries.

Different indices may be useful for different purposes. With increasing attention being focused on sustainability, it is important that the Commission look at alternative indicators and the uses which they might serve.

Future work

An outline of the main areas of future work on sustainable development and environment is provided in Box 2 below.

Box 2. Areas of work to be addressed about sustainable development and environment

1. Examination of how important environmental variables (e.g. air and water quality) contributes to current well-being, both directly, and indirectly (through costs of production and health)
2. Impact of market failures on standard monetary measures of sustainability
3. Exploration of the use of alternative metrics for valuing environmental changes
4. Incorporation of adjustments for resource depletion and environmental degradation into various "green" measures of income (Green GDP, NNI, etc)
5. Incorporation of broader measures of changes in wealth (NAS) and the design of special metrics when a comprehensive measure is deemed infeasible
6. Incorporating appropriate measures of uncertainty

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3. QUALITY OF LIFE

The goal: identifying areas where credible measurement is possible…

While most would agree that there is more to life than income, no definition of "quality of life" (QoL) enjoys universal acceptance. The discussion of what makes life worth living has occupied the best philosophers and social analysts for centuries, with different perspectives leading to different conclusions. The Commission's goal in this area is not to establish a shared understanding of what QoL means but to identify areas where credible measures, based on clear conventions and definitions, could be established.

… by moving beyond conventional economic indicators

In guiding this search, the starting point was an understanding of the most important features that give life its value. QoL is often tied to the opportunities available to people, to the meaning and purpose they attach to their life, and to the extent to which they enjoy the possibilities available to them. QoL research has identified a rich array of attributes – such as belonging, fulfilment, self-image, autonomy, attitudes of others –that are associated with QoL. Some of these attributes are intangible and difficult to evaluate. Others have a more tangible character, and can be measured in reasonably valid and reliable ways. Many important attributes of QoL are not captured by data on market transactions, however, which makes conventional, money-based, economic measures incomplete.

Assessing QoL requires considering…

In thinking about QoL, it is necessary to choose some criteria to structure the work.

- First among these criteria is the focus on the present, rather than on the QoL of future generations. The sustainability of QoL is an important issue, but is left to work described in chapter 2 above.

- Second, is a focus on the experiences of individuals rather than on (more abstract) notions referring to society as a whole. We measure the QoL of society as a whole by aggregating individuals.
- Last, is the distinction between ends and means to a good life. This distinction effectually conceptualises QoL as a vector of different elements, some of which are good in themselves, while others are means of obtaining elements that have intrinsic value.[6]

… its various elements or aspects...

Elements of QoL that are valuable in themselves will generally include both subjective and objective aspects. Subjective elements include the feelings and emotions of people, such as experiences of enjoyment, love, happiness and laughter, on the positive side; and anger, pain, worry, boredom, on the negative side. Psychological research suggests that positive and negative feelings (or affects) are independent factors that need to be assessed separately. Also included among subjective elements of QoL are people' judgements of their own life, either their life as a whole or in its different domains (such as work, family relationships, or financial resources). Such evaluative judgements involve cognitive processes that are distinct from people's emotions, and hence they represent a distinct element of QoL.

While psychological studies of QoL focus on people's own feelings other approaches to QoL broaden the information set to value people's lives beyond their self-reports and perceptions. These approaches typically emphasise the adaptation of individuals to their life-circumstances, which makes subjective feelings and report an inadequate metric to assess QoL. As an alternative, these approaches rely on some (weakly paternalistic) judgements that everyone needs to share some objective attributes to enjoy good QoL. In Amartya Sen's approach, for example, a person's life is conceived as a combination of various 'doings and beings' (functionings), and QoL is assessed in terms of a person's capability to achieve various combinations of these functionings. While the list of

[6] In this sense, our QoL measures differ from the framework used in earlier chapters, where there was an attempt to focus on *ends,* on net outputs, not inputs.

functionings will vary by time and place (with analysts differing in the importance that they attach to each), a number of them – such as health, nutrition, and basic competencies – are likely to be shared by most observers. One of the objectives of the Commission will be to identify a list of functionings that could be used to assess QoL.

… and their determinants, which include the characteristics of both people…

Beyond these aspects, or elements, of QoL, other experiences in people's life may be regarded as important in helping to achieve some other end. In several cases, different philosophical perspectives will attribute different intrinsic or instrumental value to various items (e.g. health). In other cases, however, there is more likely to be consensus. For example, income is conventionally regarded as contributing to QoL not directly but rather through the access to material goods it provides. Note however that income can also be a measure of status – in which case it is relative income which is relevant.

More generally, various activities of daily life (such as paid work, commuting, sleep, leisure) may be either valued by people on their own sake, or be a source of feelings and emotions, i.e. they have instrumental value in achieving these emotions. Different patterns of time use, across countries and over time, hence provide important information on the determinants of QoL. For example, employed people spend on average 70 minutes per day (the equivalent of 18 full days per year) commuting to and from work in Korea, but only 36 minutes per day in France and 29 minutes in the United States. Conventional measures of economic output effectively treat expenses related to commuting as increasing GDP rather than as reducing QoL (this aspect will also be treated in the first direction of study - see chapter 1). Similarly, paid work may be a source of both positive feelings (e.g. interactions with others, learning) and of negative ones (e.g. in the form of stress, insecurity, difficulty in reconciling work and family life) both of which need to be assessed.

… and of the environment where they live

Beyond these individual-level determinants, several attributes of the environment where people live contribute to their QoL. This is not

limited to the natural environment (e.g. pollution, environmental amenities) but extends to the physical (e.g. housing) and social environment. Research on social capital, for example, has stressed that social connections within families and communities, as well as people's attitudes to others (e.g. tolerance, trust), provide people with resources that allow them to be more resilient in the event of shocks and that enhance their QoL.

The characteristics of social environment that contribute to QoL encompass other, more tangible, dimensions. For example, high risk of crime lowers QoL by increasing physical insecurity and stress. Similarly, the possibility to express political voice and to participate in public deliberations, as well as trust in government, laws and in the judiciary system, increases people's ability to conduct the life of their own choice[7].

Both elements and determinants need to be operationalised through concrete measures

Identifying a set of indicators to operationalise the elements and determinants of QoL will be one of the goals of the Subgroup. This task raises a number of data challenges that are specific to each domain.

- The first challenge is to identify indicators that are reliable proxies for particular domains. For example, in the field of health and nutrition, adult body height is sometimes advanced as a suitable indicator providing information on both socio-economic conditions within a country (e.g. high-income Americans of both genders and all ages are one to two centimetres taller than low-income Americans of the same age and sex) and on how these conditions change over time (e.g. in one generation Germans have outgrown Americans by four to six centimetres, on average). More comprehensive measures of people's health may combine both objective (life expectancy) and subjective (self-reported health status) elements. Similarly, measures of political voice could be based on information on media

[7] More accurately, it increases their sense of participation in the decisions that affect them. In the standard voting model, no individual has any significant effect. This issue deserves further discussion. It may be the perception that matters.

access and participation in civic and social activities, while measures of legal protections could rely on the existence of constitutional guarantees (e.g. non-discrimination on the basis of race or gender; right to education), laws on affirmative action, ratification of international treaties, and legal guarantees of various kinds.

- The second challenge is to decide how best to measure the various indicators in each field. For example, crime victimisation may be measured through either administrative record of reported crimes, which depend on what is counted as a legal offence in each country, or on survey questions on victimisation, which need to be adapted to the legal framework of each country. Another approach to measuring crime is to ask people to evaluate their security in a purely subjective way (e.g. whether they are afraid to be out of home at certain times of the day) but even these data are not immune from criticism (i.e. across countries, fear of crime is unrelated to measures of crime victimisation).

- The last challenge is to identify areas where greater investment in statistical capacity will be needed to make these measures operational. For example, comparing time-use patterns across countries and over historical time requires surveys undertaken at regular intervals, where respondents fill out time-diaries based on consistent protocols – requirements that are rarely met and which will require new investment in statistical capacity. Similarly, suitable techniques would need to be developed to collect information on the importance that people attribute to the various aspects of their life.

The Commission will aim to identify the critical challenges in each field and the steps to be taken to overcome them. While measures have different uses, the focus will be on those that inform about QoL as well as on those outcomes that can be changed through policies (although not necessarily in the short-term). Also, as the attributes of QoL vary across time and space, the Commission will aim to identify indicators that can discriminate the performance of countries at

similar level of development (i.e. measures that allow contrasting rich and poor countries will not necessarily inform about QoL differences within each of the two groups). Finally, the Commission will assess different measures in terms of their capacity to compare countries at a point in time, to track how QoL is changing within each country, and to assess how it varies across groups within society.

Cross-cutting challenges are to account for differences in QoL across individuals…

The objectives mentioned above are specific to each QoL domain. Two other challenges are, however, cross-cutting. While, to some extent, these challenges are common to all topics addressed by the Commission, they have a special salience when considering QoL measures.

The first is the need to move beyond measures of average conditions of each country (for all the elements mentioned above) to characterize the diversity of experiences across people. Summarizing these inequalities is necessary to fill the gap between macro-estimates for the country as a whole and people's experiences of their own conditions. The best way to describe these inequalities may differ across QoL domains. For example, the diversity of competencies in each country can be described by looking at the gap in competences between high and low-achievers, either for students or for the population at large (when appropriate surveys exist). For health, however, measures of inequalities may be provided by looking at either the differences in life-expectancy across social-economic groups (i.e. in all countries, people with lower education, income and occupations die at younger ages and have, within their shorter life, a higher prevalence of different health problems) or by indicators of differences in the age of death among people born in the same year. A focus on inequalities would allow paying special attention to the experiences of those people and groups (by gender, races or other characteristics) with the lowest QoL in each of its various elements. One goal of the Commission will be to identify suitable indicators of inequalities for the different dimensions of QoL. Special attention needs to be centred in developing indicators which can identify groups of individuals which are performing poorly in many dimensions of QoL; looking at inequalities on an indicator by indicator basis may not provide a true measure of the extent of inequality within society.

… and to summarise information across QoL domains.

The second challenge is how to get a synthetic description of QoL from measures that rely on different metrics and scales—how to aggregate together numbers that might seem incommensurate. Various approaches address this challenge in different ways. The Commission will compare these approaches and assess to what extent they lead to different conclusions in terms of how countries and people compare with each other, and on how such QoL metrics have changed over time. Several approaches to summarise QoL may be distinguished.

The first approach derives composite measures of QoL by aggregating across objective indicators. In some applications, measures of <u>average</u> conditions for various domains are aggregated (i.e. the Human Development Index - HDI, or Sharp-Osberg's Index of Economic of Well-being - IEW). But an alternative, perhaps preferable, approach is to look at <u>individuals' experiences</u> with respect to the various metrics (i.e., whether people combine good health, high education, enjoy political freedoms, etc.). While this latter approach is typically used to measure non-income poverty (i.e. counting people who are deprived in several items) it could be generalised to other features of a good life and to other groups of people (i.e. not only those with the worse QoL). This approach effectively relies on a normative weighting of various objective aspects, more or less disconnected from people's preferences.

A second approach summarises people's hedonic experiences through a common yardstick. In chapter I, we used the common yardstick of money—how much people are willing to pay for different goods and services. One example of this approach, which combines objective and subjective data, is based on measures of how people allocate their time, where different activities are "weighted" through information on the degree of enjoyment of these activities, as experienced by people. Experimental applications of this latter approach in France and the United States show that, despite higher income and more emphatic reporting of their well-being in the United States, French women spend more of their time engaged in activities that yield more pleasure.

The last two approaches rely on different possible uses of people's cognitive evaluation of their lives, rather than their hedonic experiences. The third approach is based on cardinal measures of how individuals rank their life, as implemented through surveys that ask people to either provide qualitative judgments on their life as a whole or, even better, to rank their life on a (11 steps) scale (the so-called "ladder of life"). An application of this approach suggests that about half of the American population "thrives" while the other half is "struggling". This approach, which takes the view that preference satisfaction can be compared across people whatever their conception of a good life, allows computing measures of both the "average" satisfaction in a country and of inequalities in satisfaction among the population.

The fourth approach disregards satisfaction levels and focuses on people's ordinal rankings of various elements of their life such as income, leisure, health, risk of unemployment and so on. An application of this "equivalent income" approach suggests that the gap in average QoL between France and the United States could be substantially narrowed when deducting from average income people's willingness to pay to achieve some reference level of various non-income elements of life. Information about people ordinal evaluations can be obtained from life-satisfaction and ladder-of-life surveys, from observed choices, and from stated preferences in contingent valuation surveys.

Future work

The Commission will review these approaches, identify their data needs, and recommend how official statistics can feed them through relevant data. An outline of the main areas of future work on quality of life is provided in Box 3 below.

Box 3. Areas of work to be addressed about Quality of Life

Aspects of Quality of Life

1. Hedonic experiences (positive and negative feelings)
2. Evaluative judgements (for life as a whole and its main domains)
3. Capabilities (health, competencies, others)

Determinants of Quality of Life

4. Personal activities (e.g. leisure, commuting, working-time)
5. Personal safety (e.g. victimisation, fears of crime, conflicts, wars)
6. Social environment (e.g. relatedness, trust, availability of support in case of need)
7. Institutional environment (e.g. freedoms, political participation, functioning of the judicial)
8. Natural environment (e.g. exposure to noise, pollution, availability of public spaces)

Crosscutting issues

9. Measuring inequality in Quality of Life
10. Assessing different approaches to combine information across Quality of Life domains

ANNEX

ORGANISATION OF WORK
OF THE COMMISSION ON THE MEASUREMENT
OF ECONOMIC PERFORMANCE AND SOCIAL PROGRESS

At its first plenary meeting on 22-23 April 2008 in Paris, the Commission on the measurement of economic performance and social progress has decided to create three permanent working groups:

- **Classical GDP Issues**, *chair:* Enrico Giovannini (OECD); *members:* Anthony B. Atkinson (Nuffield College, UK); François Bourguignon (School of Economics, Paris, France); Jean-Philippe Cotis (Insee, France); Nancy Folbre (University of Massachusetts, USA); *rapporteurs:* Paul Schreyer (OECD); Xavier Timbeau (OFCE, France); Pierre-Alain Pionnier (Insee, France).

- **Sustainable Development and Environment**, *chair:* Geoffrey Heal (Columbia University); *members:* Kermal Dervis (UNDP, United Nations); Roger Guesnerie (Collège de France, France); Claude Henry (Institut d'Études Politiques de Paris, France/Columbia University, New York, USA); Justin Lin (World Bank); Nick Stern (London School of Economics, UK); *rapporteurs:* Jacques Le Cacheux (OFCE, France) and Didier Blanchet (Insee, France).

- **Quality of Life**, *chair:* Alan Krueger (Princeton University, USA); *members:* Bina Agarwal (University of Delhi, India); Angus Deaton (University of Princeton, USA); Marc Fleurbaey (Université Paris 5, France); Jean Gadrey (Université de Lille, France); Daniel Kahneman (University of Princeton, USA); Robert D. Putnam (Harvard University, USA); *rapporteurs:* Marco Mira d'Ercole (OECD) and Laurence Rioux (Insee – CREST, France).

The first task of the working groups has been to draft an issues paper, as a contribution to the global issues paper of the Commission. The issues paper, once approved by the Commission, is to be delivered to the President of the French Republic and published before the end of July 2008.

The second phase of work of these groups is to investigate their respective areas using the issues paper as their "roadmap". Their findings and recommendations will be submitted for discussion to the Commission. The working groups will contribute to the report of the Commission in their respective areas.

The schedule of work of the Commission is the following:

- 22 - 23 April 2008: First plenary meeting (general exchange of views, organization of work)
- End-July 2008: Issues paper
- August-October 2008, meetings and work of the different groups with the aim of presenting at the second plenary meeting of the Commission an interim report.
- 6 - 8 November 2008: Second plenary meeting (discussion of the three interim reports, and writing of a general one)
- November 2008-January 2009, meetings and work of the three groups.
- January 2009: Third plenary meeting (second interim report, design and planning of the final report)
- January-April 2009, drafting the final report.
- End-April 2009: Fourth plenary meeting (discussion and adoption of the final report)

The Commission will strive for transparency and will keep contact with civil society. There is no restriction at all on contacts between Commission's members and chiefs of national statistical offices. The Commission will establish and strengthen its cooperation with the statistical office of the European Union, Eurostat, as well as with the United Nations Statistical Division. For its external communication, the Commission will have a website. Insee and OFCE will set up and maintain this website.