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**Measuring Economic Welfare: A Practical Agenda for the Present and the Future**

**Measuring Economic Welfare: A Practical Agenda for  
the Present and the Future<sup>1</sup>  
(Draft Version)**

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“Measuring Economic Welfare in the Digital Age:  
What and How?”**

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<sup>1</sup> The views expressed herein are those of the author and should not be attributed to the Organisation of Economic Co-operation and Development (OECD). The author is accountable for any mistakes in this paper.

## Summary

GDP is the most widely used indicator from the system of national accounts. Although often interpreted as an indicator for economic welfare, it first and foremost monitors economic activity, and falls short of reflecting broader measures which try to capture well-being of people and sustainability. In 2009, the Stiglitz-Sen-Fitoussi Commission, in its Report on the Measurement of Economic Performance and Social Progress, has put forward a number of recommendations to address this apparent disconnect. The report has been an important driver of the statistical agenda of the OECD.

This paper provides an overview of the main initiatives at the OECD in the context of national accounts. First it discusses work *within* the current system of national accounts, by giving more prominence to households. The analysis of the drivers of differences between developments in real GDP versus real household (adjusted) disposable income is part of this project. Furthermore, an on-line dashboard on households' economic well-being and a regular news release on differences between GDP and household disposable income have been started to inform the public at large on the importance of looking at households and also to make them aware of the richness of the system of national accounts. Arriving at more granular distributional information on income, consumption, saving and wealth of households, consistent with the already available national accounts aggregates for households, is yet another important feature of this project.

*Going beyond* the current system of national accounts, estimates have been made of the quantitative impact of including unpaid household activities on traditional measures of economic activity. The paper addresses some of the practical problems in arriving at suitable estimates. It also deals with the related issue of how to account for free goods and services, which has gained considerable attention in the recent discussions on the potential welfare implications of the digital transformation of the economy and the society at large. Sustainability issues are being tackled by implementing the System of Environmental Economic Accounts (SEEA), including e.g. the monitoring of negative externalities by emission of pollutants, and an improved measurement of (the depletion of) natural resources.

At the end the paper also discusses a possible future agenda, by looking at the challenges of linking the macro-economic framework of national accounts (including related satellite accounts) to well-known initiatives to monitor well-being at large via e.g. the OECD Better Life Index.

## 1. Introduction

*“GDP is an indicator of a society’s standard of living, but it is only a rough indicator because it does not directly account for leisure, environmental quality, levels of health and education, activities conducted outside the market, changes in inequality of income, increases in variety, increases in technology, or the—positive or negative—value that society may place on certain types of output”.*<sup>2</sup> *“Critics have long argued that GDP is a flawed metric of global development: (a) it fails to capture much of what we want to know about human well-being; (b) it registers as a positive achievement some economic activities that are detrimental to well-being; (c) it measures increases in economic activity that occurs within a nation but it fails to reflect how much of that economic gain stays within that country; and (d) in its emphasis on the maximization of per capita GDP it fails to take into account the distribution of the economic benefits within that country”.*<sup>3</sup> According to Philipsen (2015), pages 156-157, GDP is quality-blind, people-blind, justice-blind, ecosystem-blind, complexity-blind, accountability-blind, and purpose-blind. Reading all of this literature, one sometimes gets the feeling that is best reflected by someone, his name is better kept secret, who stated when discussing an article in the Financial Times on David Pilling’s book *“The Growth Delusion: Wealth, Poverty and the Well-Being of Nations”* (Pilling, 2018): *“In the article, the author forgets to mention that GDP does not measure the distance between the planet earth and the moon, nor the depth of the Atlantic ocean and the quality of water in it”.*

The above quotes are some examples from a vast and growing literature on what one could refer to as “GDP-bashing”, or more neutrally formulated, GDP-criticism to dethrone economic growth as the ultimate objective for economic analysis and related government policy. It is not the goal of this paper to counter the GDP-criticism, but at the start I would like to shortly mention three basic flaws in this sometimes quite heated and outspoken debate. First of all, although often used and also interpreted as such, economic growth cannot be put on a par with changes in well-being, or welfare, and sustainability. This is also well recognised in paragraph 1.75 of the 2008 SNA (UN et al, 2009): *“GDP is often taken as a measure of welfare, but the SNA makes no claim that this is so and indeed there are several conventions in the SNA that argue against the welfare interpretation of the accounts”.* In this sense, David Pilling (2018), quoting Terry Ryan, the chairman of the National Bureau of Statistics in Kenya, hits the nail on the spot: *“(GDP) ... is not a meaningless indicator, but you have to understand what its meaning is”.* As an indicator of (monetary) economic activity, GDP actually does a pretty good job, but when it comes to monitoring welfare or well-being of people, it has many fallacies and caveats. Perhaps statistical offices should start to add a standard warning when publishing news releases on the latest growth numbers, stating that inappropriately interpreting economic growth can be damaging to your mental health.

Secondly, the system of national accounts is often put on a par with (the volume growth of) GDP. National accounts however provide a complete, consistent and systematic overview of all (monetary) transactions in an economy. As such, it is an extension of the double entry method of bookkeeping, first developed and applied by 14<sup>th</sup> century merchants in Venice (Gleeson-White, 2011). It actually is a beautiful and elegant system from which a variety of macro-economic indicators can be derived, not only GDP but also, amongst many others, Gross National Income (GNI), household (adjusted)

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<sup>2</sup> Kahn Academy; see <https://www.khanacademy.org/economics-finance-domain/macroeconomics/gdp-topic/circular-econ-gdp-tutorial/a/how-well-gdp-measures-the-well-being-of-society-cn-x>.

<sup>3</sup> FEW Resources.org; see <https://www.fewresources.org/gdp--well-being.html>.

disposable income, household final consumption and saving, corporate profits and balance sheets. GDP may be the most widely used indicator, but that does not necessarily mean that it is the most important indicator from the system of national accounts when it comes, for example, to tracking household material well-being.

Thirdly, it may not be possible to find what is considered by some as the holy grail, one catch-all indicator that provides a perfect monitoring instrument for welfare or well-being, which also takes into account the present-day losses (or gains) in the possibilities to generate future well-being. The pursuit of such an indicator may show to be a dead end road. Well-being is a multi-faceted phenomenon that may only be captured by a dashboard of indicators. One could try to put a price tag on each aspect contributing to the overall goal of increasing well-being for all, but in a way this also means “economising”, and thereby devaluing, everything that is considered important in life. Taking care of one’s own children, for example, is much more than just providing services similar to day-care services provided by the market economy (although admittedly, for some raising children is considered to be hard work, with an emphasis on the last word). Putting a considerable price tag on the lives of endangered species simply does not do justice to the importance of biodiversity and the morality of providing opportunities for all species to survive.

One of the most influential initiatives to have a better understanding of well-being is the “Report by the Commission on the Measurement of Economic Performance and Social Progress” by Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi (Stiglitz et al, 2009). The report contains various recommendations, among which the first five are directly related to macro-economic statistics, as follows:

- Recommendation 1: When evaluating material well-being, look at income and consumption rather than production.
- Recommendation 2: Emphasise the household perspective.
- Recommendation 3: Consider income and consumption jointly with wealth.
- Recommendation 4: Give more prominence to the distribution of income, consumption and wealth.
- Recommendation 5: Broaden income measures to non-market activities.

The main thrust of these five recommendations is to not only look at (developments in) GDP, but also to household disposable income, the distribution of income, consumption and wealth, and the free services provided by unpaid household activities (taking care of children and elderly people, cooking meals at home, cleaning, etc.). This requires, amongst others, the linking of income and finance to the process of production and income generation, and putting much more attention to other indicators than economic growth alone.

Importantly, the Report does not contain a recommendation to objectively capture well-being in a single metric, by for example monetising all aspects that have a positive or negative impact on well-being. The same holds for trying to capture (environmental) sustainability, by monetising all negative externalities from economic activities on the environment. The Report considers well-being as a multi-dimensional phenomenon, and preference is given, at least for the time being, to define the various aspects that affect well-being, and then select indicators for monitoring the developments for each of these aspects.

This paper first provides an overview of the main initiatives at the OECD to better represent (material) well-being in the context of national accounts. First it discusses, in Section 2, work within the current system of national accounts, by giving more prominence to households. The analysis of the drivers of differences between developments in real GDP versus real household (adjusted) disposable income is part of this project. Furthermore, an on-line dashboard on households' economic well-being and a regular news release on differences between GDP and household disposable income have been started to inform the public at large on the importance of looking at households, and also to make them aware of the richness of the system of national accounts. Arriving at more granular distributional information on income, consumption, saving and wealth of households, consistent with the already available national accounts aggregates for households, is yet another important feature of this project.

Section 3 follows with initiatives that go beyond the current system of national accounts. Estimates have been made of the quantitative impact of including unpaid household activities on traditional measures of economic activity. Some of the practical problems in arriving at suitable estimates are addressed in this Section as well. The Section also shortly discusses the related issue of how to account for free goods and services, which has gained considerable attention in the recent discussions on the potential welfare implications of the digital transformation of the economy and the society at large. Sustainability issues are being tackled by implementing the System of Environmental Economic Accounts (SEEA), including e.g. the monitoring of negative externalities by emission of pollutants, and an improved measurement of (the depletion of) natural resources.

Section 4 discusses a possible future agenda, by looking at the challenges of linking the macro-economic framework of national accounts (including related satellite accounts) to well-known initiatives to monitor well-being at large via e.g. the OECD Better Life Index. Section 5 summarises and concludes.

## **2. Measuring (material) well-being within the System of National Accounts**

*“UK economy posts worst quarterly GDP figures for five years” (The Guardian). “Disaster for Theresa May as economic growth slumps to tiny 0.1% – the worst for five years” (The Sun). “US Economy continues to fly high amidst rising trade tensions” (The Conference Board). “The worst four years of GDP growth in history: Yes, we should be worried” (Forbes).*

These are only a couple of citations from news media on economic growth. For many decades, volume growth of GDP has received massive media attention. It is also a primary focus of economic policy and economic research. Yet its meaning and its limitations are not particularly well understood. High levels of (growth in) GDP are simply put on a par with developments in the purchasing power of resident households or even broader concepts of welfare or well-being. This supposed linkage between economic growth and welfare or well-being may actually have held during certain periods of time. For example, in the decades after the 2<sup>nd</sup> World War, growth in GDP went hand in hand with growth in employment, increasing income levels for large parts of the society, and the possibility to acquire new, welfare enhancing consumer goods like refrigerators, in-house bathrooms, heating, washing machines, telephones, cars and TVs. The additional income also provided government the ability to

improve education and health nation-wide, and to establish financial support programmes for people being temporarily unemployed, people having a disability, and people retiring. In this sense, the welfare-state can be considered as a child of high levels of sustained economic growth.

But it is also clear that this link between continuous increases of GDP and enhanced purchasing power or, more generally, improved welfare and well-being are more and more questioned, debated and considered totally flawed. Although closer aligned to GDP, even the former alignment between GDP and purchasing power does not hold. Take, for example, the Irish growth numbers in 2015, which were highly affected by reallocations of certain activities by multinational enterprises without having a concomitant increase in the incomes of Irish households. Several studies also show a disconnect between GDP growth and changes in median income of people. GDP is far too often pursued as a policy goal, also due to its misinterpretation as a measure of welfare, whereas it is a measure of economic activity. If anything, one can interpret GDP growth as potentially contributing to the pursuit of increasing welfare, but, certainly in these times of increasing worries about the negative impact of climate change on the sustainability of the current growth patterns, it is at best at odds with the goal of (environmental) sustainability. GDP may be instrumental to welfare or well-being, but it should not be regarded as a policy goal per se.

In this Section, some initiatives are discussed which may address this problem of primarily focusing on economic growth. However, what's being discussed in this Section is fully consistent with the current framework of national accounts. The various initiatives included here do not question the main principles of the current international standards, the 2008 SNA. Other initiatives which go beyond the 2008 SNA are the topic of the next Section. Very much in line with Stiglitz et al (2009), the initiatives relate to giving more prominence to indicators on households, and compiling distributional data consistent with national accounts aggregates.

### **It's about households, stupid!**

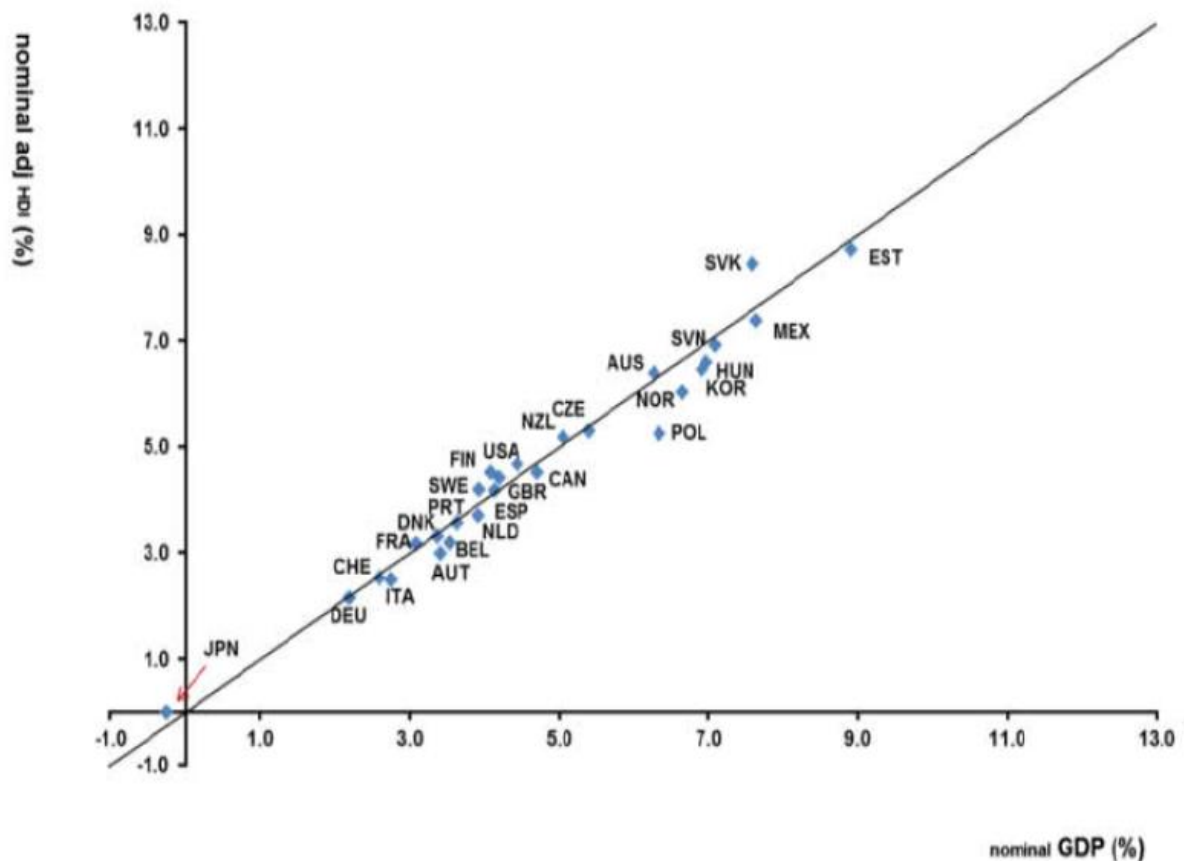
One small step in the right direction would be to emphasise household disposable income (either or not per capita or per household), instead of looking at GDP. This indicator, which can be derived from the very same system of national accounts, provides a much better indicator for monitoring the material well-being of resident households. An even more appropriate indicator would be household *adjusted* disposable income, which also takes into account the (implicit) income related to individual services provided by government for free or at prices that are not economically significant, health and education being the most widespread examples. Alternatively, one could also look at household final consumption expenditure, or – including the above mentioned individual services provided by government – household *actual* final consumption.

The main drivers of differences between the developments of real GDP and real household disposable income are related to (i) the shares of compensation of employees and income from self-employed and unincorporated corporations in the value added generated through the production process; (ii) the redistribution of income by government policy; and – in some more exceptional cases – (iii) quite distinct movements between the price change in GDP and the price change of household final consumption. The latter has happened, for example, in resource rich countries where increasing

energy prices materialised into relatively high nominal changes of GDP and household income which were not matched by equivalent changes in consumption prices.

Figure 1 below presents a comparison between average nominal growth rates of GDP versus household adjusted disposable income for the period 1996 – 2013 for a selection of 27 countries, as derived from an OECD study (Ribarsky et al, 2015). Although the deviations may seem small, one has to realise that a difference of half a percentage-point per year (e.g. in Australia) leads to an excess of growth of about 15 percentage-points over a period of 17 years. Furthermore, within shorter periods of time, the differences may be much more substantial. Certainly in the case of economic shocks, such as the 2008-2010 economic and financial crisis, one can observe quite divergent patterns, where the sudden drop in economic activity did not affect household disposable income in the first years after the crisis, mainly because government mitigated the adverse impacts of increased unemployment on income. Only later on austerity programmes had a negative impact on household income, thereby aligning long-term developments of GDP and household disposable income.

**Figure 1: Nominal GDP and nominal household adjusted disposable income (average annual growth rate of 1996-2013)**





Studies like the above are nice to have, as they are important to understand the link between GDP and household disposable income. But if one wants to re-direct attention of media, policy, politics and the public at large, away from this almost exclusive focus on economic growth, one also needs to change the policies with respect to dissemination and communication. Here, two changes have been introduced at the OECD. First of all, the OECD Dashboard on Households' Economic Well-being has gone live in 2015. Secondly, although in news releases economic growth still features most prominently in our news releases on national accounts aggregates (sorry, we are not there yet), it was decided to replace one of the standard releases on GDP growth (i.e., the one on contributions of expenditure categories to growth) by a news release on household disposable income. In addition, "OECD statistical insights" are being produced and disseminated on household economic conditions. These initiatives are shortly discussed below, after which also some recent, more general data compilation initiatives are being presented.

The OECD Dashboard on Households' Economic Well-being <sup>4</sup> consists of four blocks of two or three indicators, which are updated quarterly, with a delay of approximately four months after the reference quarter. Each block of indicators presents a certain aspect of economic well-being, as follows:

- income: GDP per capita, household disposable income per capita, and net cash transfers (mainly from government) to households;
- final consumption: consumer confidence, household consumption expenditure per capita, and households' saving rate;
- wealth: households' indebtedness, and households' financial net worth;
- employment: unemployment rate, and labour underutilisation rate.

In some cases, the preferred indicator has been sacrificed on the altar of data availability. For example, as noted before, it would have been preferable to have household *adjusted* disposable income, instead of household disposable income, but this would seriously limit the (timely) coverage of countries. The same holds for households' financial net worth, which also includes non-financial assets, in addition to financial assets and liabilities.

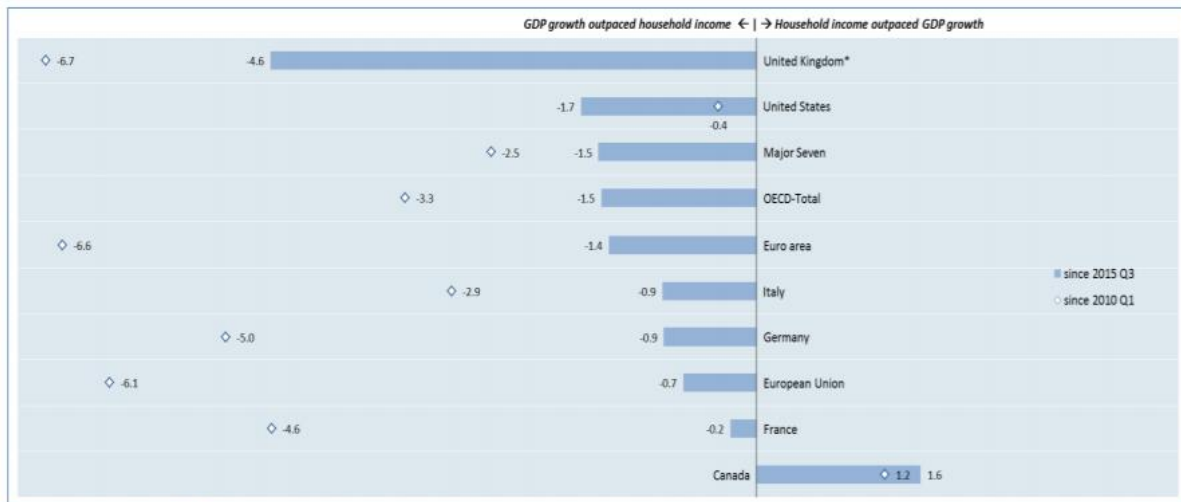
Secondly, at the beginning of 2018, the OECD also started to put further emphasis on household income developments, by disseminating quarterly news releases on "OECD growth and economic well-being". The objective of this new series of news releases is to show whether economic growth has actually led to improvements of household income, both in the most recent quarters and over a longer period of time. Figure 2 shows, for example, that since the first quarter of 2010 in most OECD-countries economic growth has outpaced growth in real household disposable income, Canada being the exception for the countries presented in the Figure. In the United Kingdom, the differences were most significant, adding to 6.7% since the first quarter of 2010, most of which was realised in the last two years.

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<sup>4</sup> See <http://www.oecd.org/std/na/household-dashboard.htm>.

**Figure 2: Comparison of growth in GDP and growth in household income, from OECD News Release of 7 May 2018**

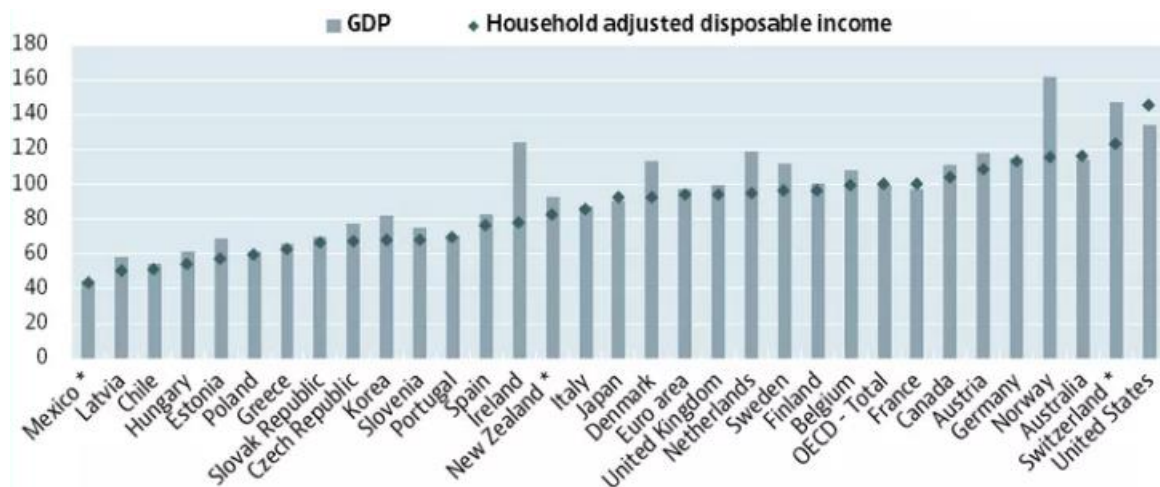
**Growth in GDP per capita has outpaced household income per capita in most OECD countries since 2010**  
 Percentage points difference in cumulative growth rates of real household income per capita and GDP per capita



\* See country note for the United Kingdom in the technical note.

Another example of trying to promote alternative indicators to a larger public is the use of statistical insights, an OECD outlet more or less similar to blogs. At the end of 2016, a Statistical Insight was disseminated to show, amongst others, level comparisons of GDP per capita versus household adjusted disposable income per capita across countries; see Figure 3. The latter indicator can have a significant on the ranking of some countries. For example, Ireland, Norway and Switzerland, and to a lesser extent Denmark and the Netherlands, have a relatively lower ranking for household income, as compared to GDP per capita. Other Statistical Insights have addressed issues like household debt and financial resilience, economic vulnerability of households, etc.

**Figure 3: GDP and household adjusted disposable income, per capita, for the year 2014 (US Dollars, current prices, current PPPs, OECD =100), from OECD Statistical Insight of 6 October 2016**



\* Data refer to 2013 for household adjusted disposable income for Mexico, New Zealand, and Switzerland.

More generally, there is nowadays much more attention to compiling a full-fledged system of national accounts, including institutional sector accounts, which provide an overview of all incomes and expenditures, financial transactions and balance sheets for the main institutional sectors of the economy: non-financial corporations, financial corporations, general government, households, non-profit institutions serving households (NPISHs), and the transactions and positions with the rest of the world<sup>5</sup>.

Three main developments have caused this gradual shift in focus from production to income and wealth. The first one concerns the well-being agenda, reinforced by Stiglitz et al (2009), as already mentioned in the above. The second longer term development affecting this shift relates to the increasing impact of developments in (financial) wealth on the real economy, and vice versa. Developments in finance can affect economic growth and employment for longer periods of time. The most dramatic example of this increasing role of finance is what constitutes the third reason for the shift: the 2008-2010 economic and financial crisis. Although data gaps probably would not have prevented the crisis, the crisis did lead to a thorough reflection of the data needs for policy and research: the G-20 Data Gaps Initiative (DGI)<sup>6</sup>. This G-20 DGI has put forward 20 recommendations for improving statistics, grouped together into four main categories: (i) better capturing the build-up of risk in the financial sector; (ii) improving data on international financial network connections; (iii) monitoring the vulnerability of domestic economies to shocks; and (iv) improving the communication of official statistics. The core recommendation under the third category relates to having timelier, more detailed and high quality data on institutional sector accounts, including financial accounts and balance sheets. Apart from getting more and better data on households across countries, such data would also make it possible to have an improved analysis of the interactions between the real economy and the financial economy. They also provide the statistical backbone for the analysis of potential vulnerabilities at sector level, e.g. the building up of unsustainable debt levels.

### ***Distribution of income, consumption, saving and wealth***

*“Every American should have above average income, and my Administration is going to see they get it”* is assumed to be said by an American president on campaign trail. That may be very hard to achieve, but it is clear that the distribution of income, consumption, saving and wealth is very high on the policy agenda, certainly after the best-seller *“Capital in the Twenty-First Century”* by Thomas Piketty (Piketty, 2014). Looking at it from a welfare perspective, (growth in) absolute levels of income and wealth may matter a lot, especially when starting from low levels, but it is clear that also income and wealth relative to others in the group affects welfare, and most certainly the perceived well-being, to a significant degree. Not only in terms of income and wealth, but also in other areas such as access to health and education, distributional issues are important. The current dissatisfaction of large parts of the population in developed countries may well be caused by a substantial part of the income growth generated by higher levels of production ending up in the pockets of the rich and advantaged, and not trickling down into improvements of income for the median income earner and households in the

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<sup>5</sup> In practice, households and NPISHs are often combined due to lack of source data, but this usually does not have a major impact on the monitoring and analysis of the household sector.

<sup>6</sup> In the meantime, the G-20 DGI has entered into a second phase. For further information, see Bese Goksu and Van de Ven (2015) and Heath and Bese Goksu (2016).

lower income quintiles. The main policy question here is how to arrive at an economic growth that benefits all people in society, how to arrive at an inclusive growth.

Within the system of national accounts, it is relatively easy, from a conceptual point of view, to incorporate distributional information, by disaggregating the households' sector into various subgroups, be it on the basis of relative income levels, household composition, or main type of income, etc. Annex 1 of the 2008 SNA includes a substantial amount of possible subsectors for corporations and government, for financial corporations even the excessive amount of 97 different subgroupings, yet for households it only contains one sub-classification of 7 subgroups according to the main type of income households receive. However, one should emphasise the word "conceptual" here. In practice, one is confronted with major data inconsistencies, and it is not that straightforward at all to get relevant distributional statistics containing information on the level of individual households aligned to the macro aggregates reported in the system of national accounts<sup>7</sup>.

In national accounts, data on households, at least the level estimates for income, consumption and wealth, are often compiled as a residual of the transactions and positions of other sectors, whose source information is generally considered more reliable. For example, government data are used to estimate receipts of social benefits and payments of taxes and social contributions by households. Similarly, data from financial corporations are used to estimate interest payments and receipts of households. On the other hand, micro-statistics containing granular information on the distribution of income, consumption and wealth across households are typically compiled using direct sources, either surveys or administrative data. As a consequence, aggregates from micro-data on households diverge from the equivalent aggregates from national accounts, creating problems on how to link and align the two datasets. The relevant gaps can be quite substantial, as shown in Figure 4 for the main income items across a number of countries. While in most countries the coverage rate for compensation of employees, taxes, social contributions and social benefits are generally acceptable, the same does not hold for mixed income<sup>8</sup>, distributed income of corporations (dividends) and interest. In the case of consumption and wealth, one can also observe similar patterns in the coverage of micro-statistics as compared to the relevant national accounts aggregates.

The main problem is thus how to match the relevant data, how to allocate the gaps between the two estimates to the various household groups distinguished<sup>9</sup>. Considerable work has been done and is currently being done in this area, both within countries and in international organisations, such as the ECB, Eurostat and the OECD. In the past, this type of work of trying to reconcile micro- and macro-data on income, consumption and wealth was often done in the context of compiling Social Accounting Matrices, not only for developed countries but even more so for developing countries; see, for example, Kazemier et al (1999), Keuning (1995), and Timmerman and Van de Ven (1994). But

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<sup>7</sup> Please note that in the statistics underlying the research and analysis in Piketty (2014), the whole of Gross Domestic Product (GDP), instead of household disposable income and its components, is allocated to household groups. This means that in Piketty's methodology various (additional) imputations had to be made to allocate income that – in reality – has not been received by households, e.g. non-distributed profits of corporations, government surplus/deficit, etc. For an evaluation of the methodology described in this paper and the methodology applied by the Piketty research team, reference is made to Zwijnenburg (2018).

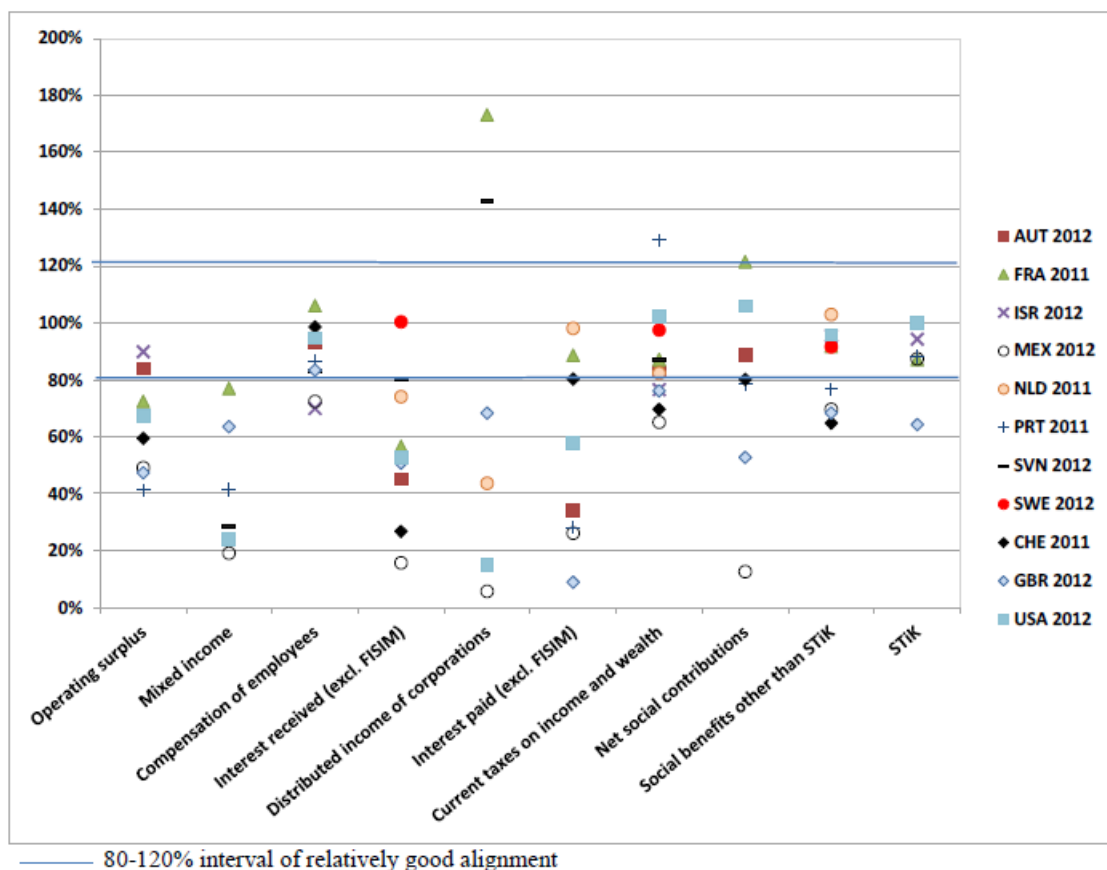
<sup>8</sup> Mixed income refers to the income of self-employed and the income from owning and running an unincorporated enterprise. In addition to the operating surplus of these enterprises, mixed income also includes an implicit compensation for the labour input of the owner and/or family members.

<sup>9</sup> Alternatively, one may also have to decide upon revising the macro-estimates from national accounts.

only recently it received much more attention after the 2008-2010 economic and financial crisis, reinforced by the publication of the Stiglitz-Sen-Fitoussi Report and the best-seller by Thomas Piketty.

**Figure 4: Coverage rates by country for the main income components**

*Micro aggregates divided by the adjusted national account totals.*



In 2011, Eurostat and the OECD launched an expert group, with the goal to carry out a feasibility study on the compilation of distributional measures of income, consumption, saving and wealth across household groups consistent with national accounts data. A first round of estimates on the distribution of income, consumption and saving by income quintile was published in 2013, followed by a second round in 2015<sup>10</sup>; see Zwijnenburg et al (2015) for a more detailed description of the sources, methods and results of the second exercise. Apart from discussing ways to allocate the gaps to household groups, the group also agreed on the allocation of social transfers in kind, i.e. the goods and services provided for free or at significantly reduced prices by government, predominantly consisting of health and education. While one can allocate education on the basis of actual use, such a procedure leads to very counterintuitive results in the case of health. Disposable income and final consumption would explode in a period that someone becomes very ill. Therefore, preference is usually given to an allocation based on the insurance cost method, i.e. what would a person with certain characteristics typically pay for a health insurance.

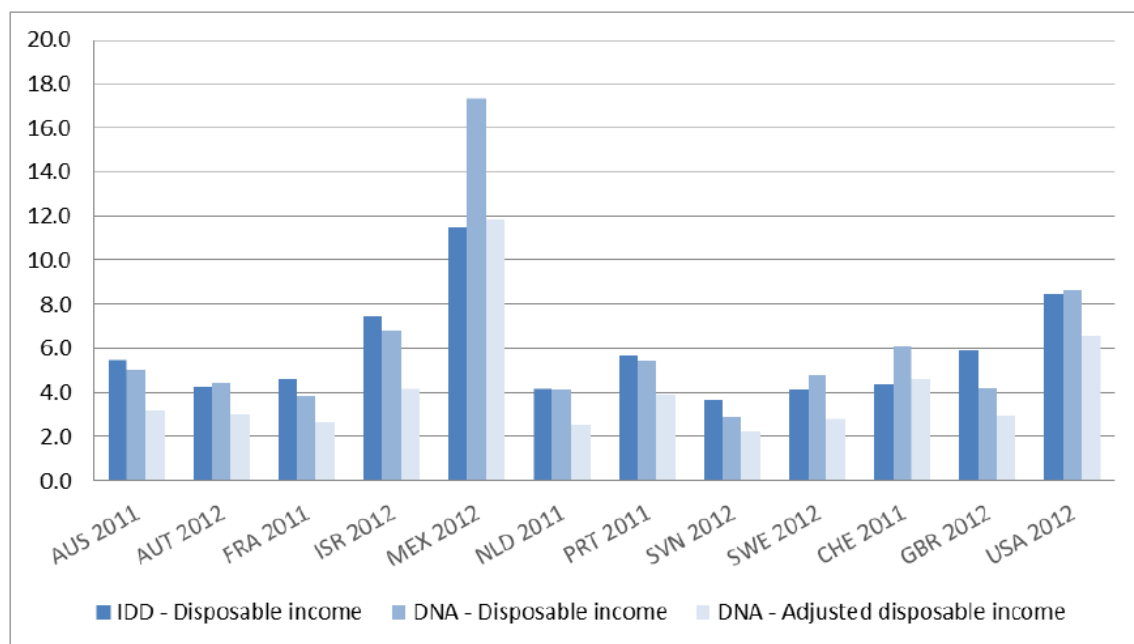
One of the problems related to the above exercises is that the distributional results will differ from the numbers that have been disseminated up to now using the micro-statistics only. Figure 5 presents

<sup>10</sup> At the time of drafting this paper, a new round has just been finalised.

the impact of aligning micro-data to the system of national accounts for a number of countries, by looking at the relative position of the 20% highest to the 20% lowest income households. It shows that the impact differs across countries, with some countries showing higher disparities using data aligned to national accounts (DNA – Disposable income), as compared to the original micro-data (IDD – Disposable income). More substantial differences, with aligned data showing higher disparities, can be found for Switzerland and especially Mexico. In Mexico, the underrepresentation of the rich and wealthy in micro-surveys is considered a major issue, as a consequence of which it has been decided to allocate the very substantial gaps in mixed income and property income in a disproportional way to the highest income quintile. On the other hand, the results for the United Kingdom show a smaller disparity for national accounts data. Looking at the results after adjusting disposable income for social transfers in kind, one can easily see the lowering impact of these transfers on income disparities. In absolute terms the relevant transfers are often relatively equally distributed across households, thus having a much more substantial impact in relative terms on the income level in the lower income quintiles.

**Figure 5: Relative position of the 20% highest to the 20% lowest income households, by equivalized disposable income quintile**

*(Adjusted) disposable income per consumption unit for the fifth quintile to the (adjusted) disposable income for the first quintile.*



For the reason that these alignment procedures call into question, if only implicitly, the quality of the distributional statistics disseminated up to now, the whole exercise is looked upon with some scepticism by parts of the statistical community. Apart from arriving at two alternative estimates on the distribution of income, consumption, saving and wealth, some argue that it is simply impossible to adequately allocate the gaps to the various household groups, especially when it concerns transactions and positions, for which the differences between micro and macro data are relatively large. This is a red herring. One may argue that we cannot solve these issues and that we will have to live with them, but it is also clear that statistical offices momentarily publish two diverging and sometimes contradicting data sets on one of the most important policy issues. In this respect, one

should also realise that not only levels can be quite different. Also developments in income and consumption may diverge substantially. In Pinkovskyi and Sala-i-Martin (2015), for example, it is mentioned that in some developing countries growth of consumption per capita according to national accounts was over 100% between 1994 and 2010, while micro-surveys only showed an increase of only 29% in this period. Obviously, this has massive implications for policy and research. Current official statistics also tend to ignore the discrepancies between often quite independently conducted micro-surveys on income, consumption and wealth, leading to implausible results for savings, and/or inconsistencies between saving and changes in balance sheet positions.

On the positive side, one has to acknowledge that more and more countries are doing in-depth research into bridging the gaps between micro-data and macro-aggregates, also leading to improvements of the system of national accounts. At the time of drafting this paper, several countries have started to publish the results of their research on compiling distributional information consistent with the national accounts aggregates for income, consumption and wealth (Australia, Canada, France, and The Netherlands), and for income and consumption (Slovenia and United Kingdom), while others have more or less advanced plans to disseminate their results (e.g., Sweden and USA).

The next steps in the project are fourfold. First of all, the goal is to further improve the methodology, and to arrive at improved distributional results. In addition to further exploring the potential for applying more sophisticated methodologies to allocate the gaps between micro and macro data, this also concerns a more in-depth analysis of the results for saving, i.e. the difference between disposable income and final consumption expenditures, by household group. The relevant numbers are sometimes remarkable, to say the least. Most countries show substantial negative saving rates for the lowest income quintile, with one country having negative rates up to the fourth income quintile. Question is whether this is economic reality or a statistical artefact. Here, having longer time series would allow for a more structural analysis of the saving rates.

Secondly, the current exercises were “limited” to income, consumption and saving. To have this extended with wealth is a highly desired objective, as it would not only significantly enrich the data set, but it would also enhance the possibilities to cross-check the results on saving and the data on changes in wealth. Thirdly, the more general target of the exercise is to have distributional data for as many countries as possible and as timely as possible. In the case that countries – for a variety of reasons – do not wish to participate in the exercise, research will be done into the development of standardised methodologies to extend the data set by making own estimates, either by Eurostat or by the OECD, which could subsequently be put forward to the relevant countries for validation. Finally, methodologies to produce more timely estimates will be explored by combining less timely structural information from micro surveys and the latest available information from macro-statistics such as national accounts, labour force surveys, etc.

### **3. Going beyond the current System of National Accounts**

It is not to be expected that in the near future there will be a major update of the international standards for compiling national accounts, as a consequence of which the definition of GDP also will not be substantially revised to include, for example, unpaid household activities and/or degradation of ecosystem services. One has to accept that for the time being official GDP numbers are first and foremost to be considered as indicators of income or economic activity, which may be instrumental to the greater good of well-being but should not to be put on a par with (material) well-being. That's not to say that nothing can and should be done. There is a great need to establish a much closer link between the SNA and the work on sustainability and well-being. We should look into ways to get away from perceiving and analysing the economy as a self-contained and isolated system, and try to embed it into the broader framework of ecosystems and societal developments, with which the economy interacts and on which it fully depends. Without being able to arrive at a path of environmental sustainability and without using the opportunities to establish a stable and just social environment, there simply is no future for the economy.

In my opinion, the most promising avenue, certainly with the enhanced technical capabilities nowadays, is to create a suite of interrelated satellite accounts (and related aggregates and indicators), linking the central framework of national accounts with a number of aspects which are considered important for progress in environmental sustainability and societal well-being. If one would also be able to create enhanced linkages between the meso-macro information base and various micro datasets, such a system would provide excellent opportunities for analysing trade-offs and win-wins between various aspects of well-being. It could also be instrumental to enhancing sustainability and well-being functions. All of this may take some time, but it would be a perfect guiding point on the horizon when redesigning official statistics.

In this Section, two concrete examples are described of recent work at the OECD, and also by countries and other international organisations. The point of departure is the current framework of national accounts, and the way in which the most substantial and consistent criticism could be addressed. The vision for the future, which would encompass a broader framework, in which the economy will only reflect part of an overall set of indicators, as alluded to in the above, is the subject of Section 4. The two issues discussed here relate to the recording and measurement of unpaid household activities and the accounting for environmental issues. An intermezzo will address some of the issues that are currently being debated when it comes to the digital transformation and its potential impact on welfare.

#### **Unpaid household activities**

One of the most fundamental criticisms when it comes to the current international standards for compiling national accounts concerns the non-recognition of unpaid services provided within households as being part of the production boundary. The latter boundary defines which productive activities should (not) be accounted for, and the production of which goods and services does (not) add to output, value added and Gross Domestic Product (GDP). By excluding unpaid household activities, the level of GDP is supposedly underestimated, while GDP growth is overestimated in times of increasing labour market participation (which often coincides with a substitution of unpaid



household activities, such as preparing meals and taking care of children, with purchasing the relevant services on the market).

When it comes to defining the production boundary, the 2008 SNA defines a general production boundary, and a more specific boundary to be applied in the actual compilation of national accounts. The general boundary is defined as follows (paragraph 6.24 of the 2008 SNA): *“Economic production may be defined as an activity carried out under the control and responsibility of an institutional unit that uses inputs of labour, capital, and goods and services to produce outputs of goods or services. ... A purely natural process without any human involvement or direction is not production in an economic sense. For example, the unmanaged growth of fish stocks in international waters is not production, whereas the activity of fish farming is production.”*

According to the general production boundary, it is clear that unpaid household activities, such as preparing meals, taking care of children and elderly, as well as cleaning, are part of production. However, the (2008) SNA standards prescribe a more restrictive boundary, specifically in relation to these unpaid services produced within and between households. The production of goods within households, the main example of which relates to subsistence farming<sup>11</sup>, should always be included, while the production of unpaid services is excluded with the exception of owner-occupied housing and the production of domestic and personal services by employing paid domestic staff. The main reasons for the exclusion of the main part of unpaid household services produced within households are summarised in paragraph 6.30 of the 2008 SNA: *“..., the reluctance of national accountants to impute values for the outputs, incomes and expenditures associated with the production and consumption of services within households is explained by a combination of factors, namely the relative isolation and independence of these activities from markets, the extreme difficulty of making economically meaningful estimates of their values, and the adverse effects it would have on the usefulness of the accounts for policy purposes and the analysis of markets and market disequilibria.”*

One could add that the inclusion of unpaid household activities may also hamper the interpretability of some headline indicators that can be derived from the framework of national accounts, in the sense that, for example, household disposable income would deviate substantially from the common perception of income, including income definitions that are being used in micro-surveys and administrative data on households. Some would argue against this point by stating that the SNA already includes various imputations, among which goods produced within households and services of owner-occupied dwellings, but one could argue here that there is a substantial difference in terms of consensus on the *economic* relevance of the items, the exact delineation and valuation, and the reliability of the estimates<sup>12</sup>. Moreover, the sheer magnitude of the adjustments needed to include unpaid household services is much larger. Whereas services of owner-occupied dwellings typically stay (well) below 10% of GDP in OECD countries, the addition of other unpaid household services would lead to a change in the level of GDP in the range of 15 to 70%, depending on the country and the methodology applied.

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<sup>11</sup> For other examples of goods production for own final use, see paragraph 6.32 of the 2008 SNA.

<sup>12</sup> In this respect, purchasing a house usually involves an outright comparison between paying rents and the costs related to taking out a mortgage loan and/or investing own funds. One can also observe that in some countries the imputed value of the income generated through occupying an own dwelling is part of taxable income.

Whatever the case, the above arguments underlying the current production boundary in the central framework of national accounts seem to be more related to practical considerations than motivated by conceptual arguments. On the other hand, when addressing “... *the extreme difficulty of making economically meaningful estimates of their values ...* “, this also concerns problems of appropriately delineating unpaid services produced within households that are to be included. Stiglitz et al (2009) list a number of these issues, for example the allocation of travelling time and the allocation of eating and drinking time, or the delineation with leisure time more generally. Some will consider gardening as a drag, while others will view upon this activity as a way to spend leisure time. As noted by Stiglitz et al (2009), “*many view cooking - and then eating – as a most enjoyable leisure activity, not a chore that is easily substitutable with a meal in a fast food restaurant*”. A similar line of reasoning could be applied to taking care of children. Yet another issue concerns the proper allocation of simultaneous activities, such as taking care of children while cooking or cleaning.

Apart from the above more conceptual and theoretical considerations, an important aspect that cannot be overlooked has to do with possible data concerns of the underlying statistics needed to compile estimates of unpaid household services, certainly when taking into account the magnitude of the estimates in comparison to the traditional national accounts aggregates. Having high quality data on time use, the typical starting point for compiling estimates on unpaid household activities, is a sine qua non to arrive at good estimates of unpaid household services, both in physical and in monetary terms. Looking at the current situation, one would definitely prefer to have time use data with more granularity into types of activities and into various groups of respondents, for example to further analyse the impact of digitalisation, or to monitor the impact of policies related to an ageing society on the demand for people’s time spent on informal care. Furthermore, the surveys are conducted quite irregularly, with time spans between consecutive surveys up to five years and more, with no alignment across countries, as a consequence of which an international comparison for a given benchmark year is not without its complications. They often also lack consistency over time, as a consequence of which developments over time may be compromised to a significant degree. Furthermore, the timeliness of the data is rather poor, with time lags of several years not being exceptional, whereas the first national accounts estimates are typically produced within 30-45 days after the end of the quarter.

All in all, one may be able to derive some long-term structural developments on the use of time for producing unpaid household services, although with some caveats given the discontinuities of the surveys over time, but most certainly, one is not able to get more insights on the short-term, cyclical changes over time. For example, one would be very interested in the impact of the 2008-2010 economic and financial crisis, with quickly increasing levels of unemployment, which in most countries is nearly impossible with the current state of affairs.

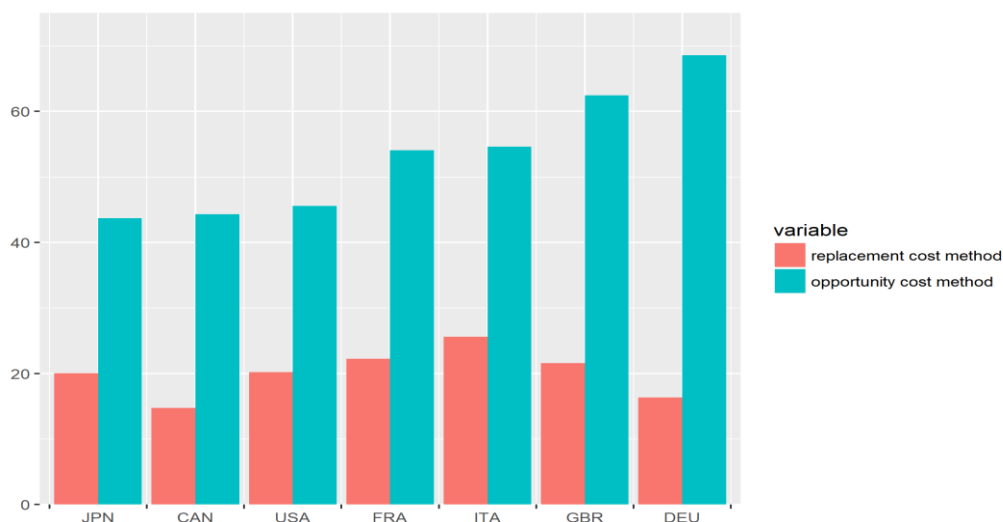
To arrive at estimates for the *value* of unpaid household activities, one typically tries to arrive at market-equivalent prices for the relevant services. One can distinguish two basic options: (i) taking the market price of equivalent services transacted on the market; and (ii) using a cost-based approach. As it may be quite difficult to put unpaid household services on a par with similar marketed services (e.g. cooking of meals), and/or to arrive at a proper appreciation of the exact services provided under the various time use categories, also taking into account differences in quality, in practice almost all available studies apply the second approach. In this approach, the level estimates of unpaid household

activities are based on the costs of labour input and the capital services derived from consumer durables<sup>13</sup>.

In applying the cost-based approach, the use of either the replacement costs or the opportunity costs for valuing the labour input has a substantial impact. In the replacement cost approach, an average post-tax, hourly wage, representative of the broad range of activities covered in the production of unpaid household services, is constructed, while in the opportunity cost approach, the average post-tax hourly wage across the whole economy is used in trying to estimate the market income foregone as a result of spending time on unpaid household activities. The opportunity costs tend to result in significantly higher numbers for the value added generated by unpaid household activities. Another method which uses information on “experienced well-being during various activities” gives results somewhat in between replacement costs and opportunity costs<sup>14</sup>.

Figure 6 shows the latest numbers on the impact of including unpaid household activities for G7-countries, as derived from Van de Ven et al (2018). When applying the replacement cost approach, it shows that the imputed monetary value ranges from 14.7% of GDP for Canada to 25.6% for Italy. The numbers for the opportunity costs method are substantially higher, and range from 43.7% for Japan to 68.6% for Germany.

**Figure 6: Own-account production of unpaid household services (% of GDP), 2015 \***



\* Data on time use are based on the latest available time use surveys: Canada (2015); France (2009-10); Germany (2012-13); Italy (2013-14); Japan (2016); United Kingdom (2014-15); and United States (2016). Data refer to the population aged 10 and over for Germany and Japan; to the population aged 11 and over for France, Italy, and the United Kingdom; and to the population aged 15 and over for Canada and the United States.

Sources: OECD Time Use Database: [http://stats.oecd.org/Index.aspx?DataSetCode=TIME\\_USE](http://stats.oecd.org/Index.aspx?DataSetCode=TIME_USE);

Gross Domestic Product: [http://stats.oecd.org/Index.aspx?DataSetCode=SNA\\_TABLE1](http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE1);

Final Consumption Expenditure of Households: [http://stats.oecd.org/Index.aspx?DataSetCode=SNA\\_TABLE5](http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE5);

Taxing Wages: <http://stats.oecd.org/Index.aspx?DataSetCode=AWCOU>.

<sup>13</sup> To arrive at full output estimates, one should also include intermediate goods and services, such as the ingredients for cooking meals. Often, these are ignored, not only because it's difficult to capture them, but also because it does not affect value added generated by these activities. This also holds for the estimates from Van de Ven et al (2018).

<sup>14</sup> For more information, reference is made to Box 2 in Van de Ven et al (2018). For the countries for which data are available to construct estimates according to this alternative method, the USA exceptionally shows results which are very close to the replacements costs.

Estimating the impact on real growth rates of GDP is seriously affected by the scarce availability of sufficiently long and consistent time series of time use data. However, for a couple of countries, this analysis can be performed, although the results should be interpreted with some care. Including unpaid household activities generally leads to a lowering of the official growth numbers<sup>15</sup>. Since the 1970s, in many countries female labour participation has (significantly) increased, as a consequence of which time spent on unpaid household activities has decreased compared to the time spent on paid activities, and unpaid household services have been substituted by services provided by the market. For Canada<sup>16</sup>, for example, official growth rates between 1981 and 2015 are lowered, on average, by 0.14 percentage points when applying the replacement cost approach. The decrease is 0.43 percentage points for the opportunity cost method, ranging from 0.26 to 1.03 percentage points for the various sub-periods distinguished before 2005<sup>17</sup>. Interestingly, adjusted growth rates are higher than official growth rates in the period 2005-2010, the impact ranging from 0.21 to 0.43 percentage points, depending on the valuation methodology. One may assume that this is, at least partly, related to the effects of the economic and financial crisis. The picture for the USA<sup>18</sup> between 1975 and 2016 is similar to that of Canada, the inclusion of unpaid household activities on the basis of the replacement cost method lowering GDP growth by 0.34 percentage points on average, while the impact using the opportunity cost method decreases official growth rates by 0.65 percentage points on average. Here too, one can observe a positive impact of the adjustments on official growth rates for the period 2008-2010, during the economic and financial crisis. In the period 2010-2014, the impact returns to its normal pattern of lowering official growth rates, although in the latest period, 2014-2016, growth rates including unpaid household activities are higher again.

### **Intermezzo: Digitalisation and household welfare**

In the above, reference was made to the digital transformation of the economy. This transformation has major consequences for the way things are done within the economy and the society at large. Internet access by households has led, for example, to a blurring between market production, unpaid household activities, and leisure. Here, one can think of own booking of hotels or flights by households, instead of arranging this via a travel agency; self-service at supermarkets; on-line banking; etc. What these changes have in common is a movement from purchasing services delivered by dedicated market producers out of market. All of these new activities are, similar to unpaid household activities in general, not captured in GDP.

One can look upon these newly emerging activities as yet another layer in the problem of capturing unpaid household activities and related well-being, or welfare, in the system of national accounts. It

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<sup>15</sup> Please note that no allowance has been made to changes in labour productivity in compiling results on the production of unpaid household services over time. One could, for example, assume a productivity change equivalent to the developments in relevant market activities. This would then lower the divergence between economic growth numbers including and excluding unpaid household activities, at least for the periods in which official economic growth is higher than the adjusted one.

<sup>16</sup> The intertemporal developments of time use data may be affected by changes in the reference population. For the countries mentioned in this paper, this holds for the developments in Canada between 1971 and 1981, and the developments in the US before 2003.

<sup>17</sup> Please note that the impact on growth rates also depends on the valuation method applied, with the impact on growth rates being larger when the applied wage rate and therefore the weight of the imputed unpaid household services is higher.

<sup>18</sup> See foot-note 15.

is not new, displacements of market activities by unpaid household activities, and vice versa, have always been taking place, but digitalisation has certainly raised the issue to a higher and more prominent level.

Another, slightly different, issue concerns the “free” provision to households of apps, search capacity by Google, social networking through Facebook, Tencent, etc. In these cases, the financing of these services is often arranged via revenues from advertisements or through the provision of data<sup>19</sup> which are subsequently used as a business model for generating revenues (including the advertising mentioned before).

The provision of these “free” services is frequently cited as output that goes unnoticed despite their contribution to consumer welfare, and there is indeed quite some debate going on to impute additional output, value added and household final consumption of “information services” which are financed through advertising<sup>20</sup>. The rationale usually put forward is that households actually derive substantial welfare from consuming free apps or Facebook, which should be accounted for. One may wonder, however, whether the recording of this additional consumption does not lead to a double-counting, as households implicitly pay more for the products of the advertising firms. Whatever the case, it is also clear that – again – we are not dealing with a new problem. Broadcast television, radio, newspapers and the like have also been provided for free or at significantly reduced prices because of advertising revenues. Similarly, sports clubs may provide free entry to skyboxes for their sponsors. When looking at estimates for media services, it actually shows that the impact on economic growth of changing the recording of free services financed through advertising revenues is minimal. Nakamura and Soloveichik (2015), for example, impute a value of production by unincorporated household enterprises equal to the value of advertising receipts and use data on advertising expenditure for different media. Although these imputed services grew considerably faster (at 6.7% per year) than overall GDP, the impact on economic growth across some 80 countries amounted to 0.018%.

Yet another phenomenon relates to the growing activities of communities of people together creating freely available assets like Wikipedia, R, Linux, etc. From an accounting perspective, the inclusion of these activities and assets is a completely different matter. Although it is clear that the relevant assets generate benefits for the users of these assets, the use is free of charge, and thus not accounted for in the current system of national accounts. Of note is that the users are not restricted to households, also enterprises and governments make more and more use of such free software, thereby replacing the use of purchased software.

Accounting for this phenomenon of free assets is not that straightforward, it actually gives rise to major complexities, both from a measurement perspective and from a conceptual point of view. One could, for example, look upon this phenomenon as people providing input to the creation of a commonly produced asset, which would lead to an extension of the current production and asset boundaries of the 2008 SNA. People in the community contributing to the asset would be regarded as

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<sup>19</sup> In this age of digitalisation, one can observe an ever increasing role of personal data in the economy. It calls into question the current recording, or better to say non-recording, of exchanges of data without a monetary counterpart transaction, and of data as an asset category. This issue is discussed in more depth in Ahmad and Van de Ven (forthcoming).

<sup>20</sup> For more details on the various options to include these services in the system of national accounts, reference is made to Ahmad and Schreyer (2016) and Ravets (2016).

being producers of services, the value of which could be based on the time spent multiplied by a measure of the hourly compensation. The annual services provided would then be recorded as annual additions to, or investments in, the assets, while the sum of these additions, adequately adjusted for the decline in value as a result of normal obsolescence<sup>21</sup>, would lead to a monetary estimate of the capital stock. This recording and valuation however still leaves open the question on how to account for the ownership and the use of these assets. The assets typically are worldwide available assets in the cloud, so even an allocation of the ownership to countries would prove to be quite challenging, to say the least. One could consider the community of producers as a kind of virtual non-profit institution serving households (NPISH), and consider this NPISH as the creator and the owner of the assets. The services delivered by this NPISH – equal to the sum of costs of operating the relevant asset, including the value decline of the assets due to normal obsolescence – could then be regarded as final consumption of NPISHs. In the 2008 SNA, the final consumption of NPISHs (and the individual part of government final consumption) is subsequently re-allocated to the benefiting households, with a concomitant (social) transfer in kind. A similar recording could be envisaged for the NPISHs providing services from free assets, however with the added complication of having to figure who actually benefits from these assets, which do not only consist of households but also include enterprises<sup>22</sup>. Finally, one should also take into consideration that in the process of recording the production of these assets additional income is being allocated to the community of people contributing to the build-up of the assets. To balance the accounts, the free delivery of these services would need to be counterbalanced by an equivalent current transfer of some kind. All in all, a considerable amount of imputations, not to mention the complexities in valuing the relevant transactions and positions, and allocating them to countries and sectors. An example of all accounting entries is provided in annex 1.

A completely different approach to measuring welfare gains from free services is taken by Brynjolfsson et al (2018). In their research, consumer surplus from digital services is derived from surveys on measures of willingness to pay or willingness to accept. In the main experiment, a single binary discrete choice (SBDC) experiment, consumers are asked “... to make a choice between keeping a digital good or taking a monetary equivalent compensation when foregoing it”. As a benchmark to check the results, an alternative lottery procedure has been applied for Facebook. The results are striking, to say the least. The median willingness to pay, which is assumed to be equivalent to the consumer surplus attached to digital services, add up to more than 32,000 US Dollar per year in 2017, with “all search engines” and “all email” ranking highest (17,539 US Dollars and 8,414 US Dollars, respectively), and “all music” and “all messaging” ranking lowest (168 US Dollars and 155 US Dollars, respectively). Brynjolfsson et al (2018) also shows the results of choices between digital services, non-digital products, and giving up a certain amount of income, by applying a Google consumer survey. The results confirm the results for the other experiments. For example, no access to all internet for one year is ranked just below giving up income of 5,000, 10,000 and 20,000 US Dollars for one year. Applying massive internet surveys, Brynjolfsson et al (2018) claims that it would be relatively easy to make estimates for the consumer surplus derived from the complete basket of goods and services

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<sup>21</sup> Here, the term “consumption of fixed capital”, or depreciation, has been avoided, as in the current system of national accounts the former terms are limited to physical deterioration, normal obsolescence and normal accidental damage of produced assets.

<sup>22</sup> Not to mention the additional complication of allocating social transfers in kind to enterprises, whose receipts are currently restricted to households. In the case of enterprises, one may also need to consider a reclassification of final consumption to intermediate consumption.

consumed by households. Such a measure could then supplement the traditional measures of household final consumption.

One wonders about the above estimates of consumer surplus related to digital services. One problem is that the estimates do not (adequately) reflect budget constraints which households are facing in real life. Although the authors' goal is to arrive at a measure of consumer surplus, one starts to wonder about what consumers actually would be willing to pay, given budget constraints, thus trying to capture some measure of the shadow prices of free digital services. Such a measure would be more consistent with the current valuation methodologies based on market prices, as applied within the system of national accounts.

More generally, one would like to have a more holistic approach to free goods and services, which also includes, for example, all other unpaid household activities. Perhaps this could be done with massive internet surveys, like the one done for the extended Google survey on choices between digital services, non-digital products and income. It would be great to be able to make a comparison of the results for unpaid household activities with methodologies using a cost-based approach, like the one explained in the above.

Furthermore, as it stands now, the methodology will only be able to provide some kind of supplementary measure for consumer surplus, thus making it possible, for example, to compare the results to the monetary estimates of household final consumption. However, it would be a stand-alone measure, not embedded in a system of accounts, thus also providing possibilities to improve the rigour of the estimates, by using the consistency rules of output, expenditure and income, and providing ample opportunities for policy analysis in a broader context.

Last but not least, the methodology applied by Brynjolfsson et al (2018) may indeed be considered as a viable way forward to estimate total consumer surplus. But, if one would like to arrive at a broader measure of (sustainable) well-being, one still is faced with the problem of not taking on board certain aspects that also directly affects well-being, such as health, social relationships, environmental conditions, etc. Keeping it closer to the topic of free digital services, one also wonders whether negative externalities from free digital services on e.g. trust, work-life balance, etc. are adequately reflected in the estimates, whether consumers take this type of issues into account when entering into the choice experiments. Whatever the case, the point to be made here, is that the methodology remains a consumption-oriented approach, although – as said – it could perhaps be extended to include the whole range of unpaid household activities, and to include alternative valuations for the whole consumption basket of households which better reflect the welfare households derive from them.

Before turning to the issue of sustainability, one final remark on the digital economy. Looking at the current system of national accounts, more specifically the supply and use tables which describe the production process and the transactions in goods and services, it is clear that the classification systems for industries and products do not appropriately reflect the newly developing digital activities. It is therefore very hard, if not impossible, to track the extent and growth of digital activities and products, as they are usually an implicit part of broader categories such as trade, transport, housing, etc. To meet this user demand, a satellite account on the digital economy is in the process of being developed

and subsequently populated. The satellite account separately distinguishes transactions that electronically ordered and/or electronically delivered, in addition to breaking out more traditional activities that are to be considered as enablers of the digital economy (ICT, telecommunication, etc.). The framework also allow for an extension of the production boundary, by including estimates of free digital services.<sup>23</sup> In respect of the latter, the estimates by Brynjolffson et al (2018) could indeed provide a great addition, although one would prefer to have estimates which try to capture a valuation of free services which is more consistent with the traditional valuation methodologies of national accounts. From the perspective of trying to capture well-being more broadly, having full-fledged estimates on the consumer surplus derived from the whole basket of household final consumption, including free digital services and, more broadly, all unpaid household activities, could feature as an excellent supplementary measure, adding to our understanding of what drives household welfare.

### **Taking the environment into account**

It is clear that the 2008 SNA deals poorly with issues related to environmental sustainability. There may be some accounting for the stocks and flows of natural resources, but this is limited to those assets that fall within the SNA asset boundary. From an environmental perspective, this is a serious limitation. In the 2008 SNA, assets are only recognised and recorded if they concern “... *a store of a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the entity over a period of time*” (paragraph 3.5 of the 2008 SNA). Ownership and generating benefits to the owner are core characteristics to this delineation. Mineral and energy reserves will normally qualify as assets. Also biological resources yielding repeat products in the future, such as dairy cows and forests, are included as assets, if the natural growth and regeneration are under the direct control, responsibility and management of people. Some non-cultivated biological resources may be recognised as assets as well, but only those “... *that are currently, or are likely soon to be, exploitable for economic purposes*” (paragraph 10.182 of the 2008 SNA). Water resources are again only taken into account when it concerns “...*surface and groundwater resources used for extraction to the extent that their scarcity leads to the enforcement of ownership or use rights, market valuation and some measure of economic control*” (paragraph 10.184 of the 2008 SNA). It should further be added here that, although the 2008 SNA clearly includes the accounting for the stocks and flows of the relevant assets, not that many countries do actually compile data for these assets.

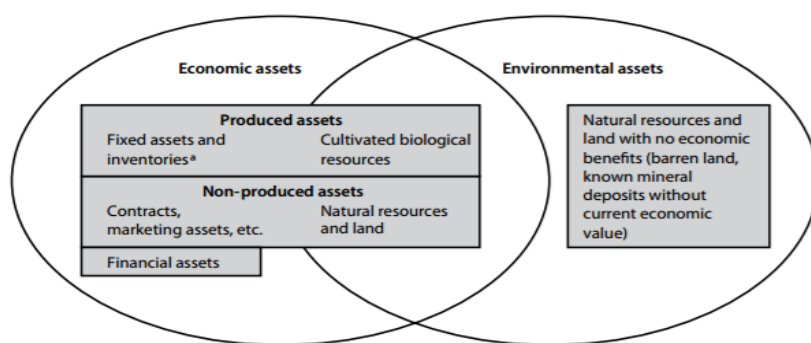
One can thus conclude that stocks and flows relevant for monitoring environmental sustainability are simply not accounted for in the system of national accounts. Instead, a separate accounting framework has been developed and endorsed as an international statistical standard: the System of Environmental-Economic Accounting (SEEA) 2012 – Central Framework, with the objective of providing a “*multipurpose conceptual framework that describes the interactions between the economy and the environment, and the stocks and changes in stocks of environmental assets*” (paragraph 1.1 of SEEA 2012). SEEA 2012 has a broader definition of assets, at least in physical terms. It also includes natural assets which do not have a monetary value, such as uncultivated land, forests and water resources which are not exploitable for economic purposes. Figure 7 provides a nice overview of the differences between the asset boundary of the 2008 SNA and the one of SEEA 2012.

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<sup>23</sup> For more details, see Ahmad et al (2018).



**Figure 7: Relationship between environmental and economic assets**



\* Other than cultivated biological resources.

Source: SEEA 2012 Central Framework, page 139.

In addition to an extended accounting for natural assets, and perhaps more importantly from a monitoring perspective, the central framework of SEEA 2012 includes a set of physical flow accounts, in which natural inputs, products and residuals are linked to economic activities. Physical supply and use tables are included for energy, water, and various material flows (emissions to air, emission to water, and solid waste). Another part of the framework concerns a more prominent accounting for environmental activity by identifying economic transactions within the system of national accounts which mainly relate to “... economic activities whose primary purpose is to reduce or eliminate pressures on the environment or to make more efficient use of natural resources” (paragraph 1.30 of SEEA 2012). A final set of accounts breaks out environmental taxes, subsidies and similar transfers.

The uptake of implementing SEEA-consistent accounts has been relatively good, with currently 69 countries having programmes on environmental-economic accounting. The goal for 2020 is to have at least 100 countries with ongoing, well-resourced programmes in line with SEEA 2012 – Central Framework. Within the European Union, the compilation of a number of SEEA-accounts is even made mandatory through a set of regulations. Furthermore, global databases are being developed, with priority given to accounts for air emissions, energy, material flows, land, and possibly water. At the OECD, a programme has started to build up databases for emissions to air, mineral and energy reserves, and in the near future environmental taxes. These accounts will gradually be extended, by collecting national data and by including own estimates for missing countries.

The endorsement and implementation the SEEA 2012 – Central Framework can be considered as a major step forward. It will make it possible to better monitor and analyse the externalities of production and consumption activities in the form of emissions, it will also make it possible to better monitor, for example, the uptake of environment-friendly activities. Furthermore, an improved accounting for mineral and energy resources would make it possible to calculate a Gross Domestic Product which is not only adjusted for depreciation of produced assets, but also adjusted for depletion of natural resources.

However, much more needs to be done. The economy and the society at large are embedded in and depending on the limitations provided by Planet Earth. From a sustainability perspective, the most important assets are ecosystem assets. Paragraph 2.31 of SEEA 2012 – Experimental Ecosystem

Accounting (SEEA-EEA) defines ecosystems as “... *spatial areas comprising a combination of biotic and abiotic components and other characteristics that function together*”. These assets provide ecosystem services, benefits used in economic and other human activity, a rather euphemistic formulation for services on which human and other life depends. In SEEA-EEA, three main types of services are distinguished: (i) provisioning services (e.g. timber from forests); (ii) regulating services (e.g. forests providing carbon sinks); and (iii) cultural services (e.g. the pleasure of visiting a national park).

To arrive at a statistical framework for ecosystem accounting, SEEA-EEA contains a set of experimental guidelines, as an important first step for their further development. As noted on page v of SEEA-EEA, it “...*offers a synthesis of the current knowledge in this area and serves as a platform for the development of ecosystem accounting at national and subnational levels. It provides a set of terms, concepts, accounting principles and classifications; and an integrated accounting structure of ecosystem services and ecosystem condition in both physical and monetary terms. In SEEA Experimental Ecosystem Accounting, it is recognized that spatial areas must form the basic focus for measurement*”.

Ecosystem system accounting is not straightforward at all. In physical terms, consensus has more or less been achieved on the way forward. However, accounting for the monetary value of the stocks of ecosystem assets, and their degradation over time, is a completely different story. Notwithstanding the complexity, much progress has been made in recent years, and work is ongoing to further improve methodologies. In future, all this work could potentially lead to the compilation of physical and monetary estimates for stocks and degradation of ecosystems.

One should notice, however, that from a conceptual point of view there is a significant difference between ecosystem assets and other natural resources. Whereas in the case of e.g. mineral and energy reserves one can observe a clear ownership of these assets, and also an institutional unit that bears the costs of depletion, ecosystem assets often do not have such a clear ownership relation and the loss of ecosystem services goes without any monetary costs for the relevant producers and consumers whose use of ecosystems has led to the degradation. For this reason, one often is not able to allocate ecosystem assets to industries and sectors, or even to countries. It is also not possible to simply deduct the loss of ecosystem services from value added and GDP, to arrive at macro-economic indicators of economic activity that are adjusted for depreciation, depletion *as well as degradation of ecosystems*. If economic agents actually had to bear these costs, one would have arrived at a completely different set of economic activities, and thus a completely different level of GDP.

As an alternative for fully integrating ecosystem assets, including the (net) degradation as a result of economic activities and other, human and non-human, interventions, one could think of the proposal put forward by Vanoli (2017). He proposes to add the monetary value of (net) degradation of ecosystems as “unpaid ecological costs” to the final expenditures, thus arriving at final consumption and gross fixed capital formation at “total costs”. The unpaid costs would feed as a negative into saving, which would subsequently add to the increase of a new liability category, “ecological debt of the economy”. It may not be feasible to allocate these costs to sectors or industries, in some cases it may actually show to be non-trivial to allocate the costs to countries, but for sure recording the degradation of ecosystems in such a way would make the accounts much more transparent in showing the externalities caused by economic activities.

#### 4. A vision for the future

Kenneth Boulding once remarked that *“anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist”*<sup>24</sup>. Amongst others, Philipsen (2015) shows the ridiculousness of continuously pushing for a 3% growth of world GDP, which would result in a doubling of the world economy every quarter of a century, and leading to a world economy which by the end of the 21<sup>st</sup> century would be eight times larger than the current one. Adding another century would lead to a 128-fold multiplication of the current level of economic activity. All of this is not to say that compiling national accounts is pretty much useless. Clearly, monitoring and analysing economic activities are important in their own right, for example to support policies for designing a financially sustainable economy. But that should not lead to policies that continuously and exclusively beat the drum of an unconditionally higher GDP. For what purpose? For whom? Economic growth cannot be the ultimate objective of a society. As many have said, we need a better navigation system that guides policy towards the enhancement of wellbeing of people, without jeopardising the sustainability of wellbeing for future generations to come. But often voices become much softer, or even silent, when it comes to concrete alternatives which could provide clearer guidance for the future direction of societal developments, have a rigorous and conceptually sound underlying measurement framework, and – last but not certainly least – are easy to communicate.

It is important though to develop metrics that cast a wider net on the monitoring of well-being of people, which go well beyond the traditional economic indicators. As (sustainable) well-being is a multidimensional phenomenon, it may not be possible to capture it in one catch-all indicator, and one thus has to agree and rely on a set of indicators which monitor the most relevant aspects of well-being. An important example of this way of capturing well-being is the OECD Better Life Index (see <http://www.oecdbetterlifeindex.org/>), in which eleven areas are monitored by a dashboard of indicators. The following areas and indicators are distinguished:

- Housing: housing expenditure, dwellings with basic facilities, rooms per person;
  - Income: household financial wealth, household net adjusted income;
  - Jobs: job security, personal earnings, long-term unemployment rate, employment rate;
  - Community: quality of support network;
  - Education: years in education, student skills, educational attainment;
  - Environment: water quality, air pollution;
  - Civic engagement: Stakeholder engagement for developing regulations, voter turnout;
  - Health: self-reported health, life expectancy;
  - Life satisfaction: self-reported life satisfaction;
  - Safety: homicide rate, feeling safe walking home at night;
  - Work-life balance: time devoted to leisure and personal care, employees working very long hours.
- In each of these aspects, regional and interpersonal distributions are considered to be of the utmost importance. Clearly, if inequalities of say income, wealth, health, education, etc. coincide, the impact on well-being for the people at the bottom of the distribution can be very detrimental.

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<sup>24</sup> United States Congress, House (1973) Energy reorganization act of 1973: Hearings, Ninety-third Congress, first session, on H.R. 11510, page 248.

However, to take it a step further and to make it even more useful and relevant for policy purposes, in my opinion it would be a very welcome addition to design and populate an underlying framework which links the various aspects of (sustainable) well-being. Such a framework would make it possible to better monitor, analyse and understand the interrelations between the various aspects of well-being, and to better understand the trade-offs and the win-wins between the various domains. For example, what's the relationship between on the one hand the output of the medical industry and unpaid household activities on care for (non-)household members, and on the other hand the health outcomes of people, and how does this affect, for example employment and government finance. How to improve health outcomes? Should we spend more money on prevention, on development of pharmaceuticals, on improving medical techniques, and how much money are we willing to expend? In efforts to answer this type of questions, linking of business statistics on the medical industry, very granular administrative data on treatments, data on relevant time use categories, government finance, national accounts and, last but certainly not least, relevant outcome indicators could indeed be a very promising way forward.

As shown before, this way of thinking and analysing is actually very well developed in the area of environmental sustainability. But there are also other promising initiatives. For example, quite a number of countries have done work on health satellite accounts, while more and more work is being done on exploiting administrative data on medical treatments, for example to arrive at better volume measures for health services. Furthermore, in the area of education and training, a conceptual framework for compiling satellite accounts for education, training and human capital has been developed; see UNECE (2016). The same is true for satellite accounts on unpaid household activities (see UNECE, 2017).

In the latter case, as shown in Section 3 of this paper, various attempts have been made to value the unpaid services, although for many types of analysis, a monetary valuation is not strictly necessary. Having a complete set of data on time use, which are integrated and combined with data on paid employment (and related income), as included in the system on national accounts, one could easily derive major shifts in how people spent their time and how this affects the paid economy, as currently represented by output, value added and GDP. Actually, having more granular and more timely data on time use would provide a magnificent tool for monitoring and analysing shifts in time spent on various activities, including shifts from paid to unpaid activities and vice versa, which are considered highly relevant for the measurement of people's well-being, whether this may concern activities benefiting people's own well-being (e.g., work-life balance, leisure), other people's well-being (e.g., childcare, eldercare, volunteering), or both (e.g., socialising). One wonders, for example, how government policy on long-term care affect people's labour input in paid and unpaid care activities? Furthermore, it would be great to have additional information on e.g. digital activities, such as time spent on social media, search activities, etc., thus allowing for an alternative way of measuring consumer surplus that may arise from the digitalisation of the society. However, the requested granularity and timeliness cannot be achieved by applying the traditional survey methods. We need to think about the potential of big data to compile time use data, or at least to supplement current data collection methods.

As a point on the horizon, one would like to see the development of an overarching accounting framework, in which statistics on economic, societal and environmental issues are integrated (not necessarily monetised), and in which one can easily drill down into micro-datasets. It is clear that this would definitely be a long-term goal, also requiring the development of a suitable conceptual framework. As a more realistic goal for the nearer future, one could envision the regular compilation of certain satellite accounts, such as the ones mentioned in the above. Having satellite accounts for the environment, health, education and unpaid household activities, or time use more generally, on a regular basis for a substantial number of countries would definitely support the monitoring and analysis of quite a number of well-being aspects included in the OECD Better Life Index, and other dashboards at international and national level.

In developing such a broader framework, one should acknowledge the importance of communication. Referring to the traditional set of national accounts as being the “central framework” or the “core” set of national accounts, and referring to the measurement frameworks for other areas as being satellite accounts, is not particularly helpful. In line with Vanoli (2017), we need to rethink terminology and the content of what’s currently being referred to as the central framework. Vanoli proposes to refer to the current set of national accounts as the System of National Economic Accounts (SNEA), and to include a much broader set of accounts in the central framework of national accounts. One would perhaps even want to go a step further when it comes to the term for the current set of national accounts, and refer to it as the System of National Monetary Accounts, to make clear that economy is more than a consistent set of monetary transactions and positions. Furthermore, Vanoli also presents a concise conceptual foundation for the broader set of accounts, with reference to four spheres and their related information systems: economy, people, nature and society. A similar plea for a new and comprehensive “System of Global and National Accounts”, including an in-depth analysis and description of how such a system should look like can be found in Hoekstra (forthcoming). Hoekstra argues for a distinction of four sets of interrelated accounts, three describing the environment (Global Environmental Accounts), the society (Global Societal Accounts) and the economy (Global Economic Accounts), and one describing distributional aspects (Global Distribution Accounts). A separate set of Global Quality Accounts is distinguished for the definition and recording of key indicators that can be derived from the other accounts, to provide a summary on whether things are moving in the right direction.

Here, a more pragmatic approach is being proposed<sup>25</sup>, to get things moving forward relatively quickly. Relatively quickly, as it may still take some time to define the exact conceptual framework, including the templates, discuss these proposals and have them endorsed at the international level, and – last but certainly not least – to get all of this implemented by countries. Instead of embarking on a full-scale update of the 2008 SNA, the UN Statistical Commission, in its 49<sup>th</sup> meeting held on 6-9 March 2018, agreed to develop guidance notes on three areas for which further clarifications and guidance were needed in the context of the system of national accounts: (i) digitalisation, (ii) globalisation, and (iii) sustainability and well-being. A starting point for pushing the above ideas could be the compilation of the latter guidance note. However, it should not come as a surprise that the whole process may take 5-10 years from now. In moving forward, it is considered of the utmost importance to involve

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<sup>25</sup> The approach here is similar to, but also much broader than, the SESAME-approach in which the Social Accounting Matrix was combined with Environmental-Economic Accounts; see e.g. Kazemier et al (1999).

specialists from other areas of expertise (environment, social issues, education, health, time use, etc.) as well. One should avoid that all of this is looked upon as a form of economic imperialism. The objective is to arrive at a consistent framework which covers much more than the economy alone.

## 5. Summary and conclusions

*“So it has come to this. The global diversity crisis is so severe that brilliant scientists, political leaders, eco-warriors, and religious gurus can no longer save us from ourselves. The military are powerless, but there may be one last hope for life on earth: accountants”* (Jonathan Watts, The Guardian, 28 October 2010).

The above quote may look slightly satirical, but the author is not trying to be. Instead, he wants to emphasise the importance of quantifying, in this case, the stocks and flows of ecosystems. According to him, without (monetary) quantification of the costs related to degradation, environmental issues are not truly taken into account in designing policy. It is related to the argument that economic growth of GDP, being the most successful macro-indicator showing its relevance in certain periods of time, basically defines what is to be considered as a successful economy, or even more broadly whether societal development are going in the right or wrong direction, and why it still largely drives the policy agenda, despite its lack of accounting for well-being and environmental and societal sustainability. Philipsen (2015) looks upon GDP as the devil in disguise, seeing conspiracies all over the place to show the importance, or “value added”, of industries. I don’t think that this is a fair assessment, but – as Gleeson-White (2011) argues – methods to summarise developments can have an impact on the goals we pursue. As an example, in addition to the success-story of GDP, she mentions the concept of “profit” that could for the first time be explicitly derived from the double entry bookkeeping system developed in the golden years of Venetian trade in the 14<sup>th</sup> century. Or, as Stiglitz et al (2009) puts it: *“What we measure affects what we do; and if our measurements are flawed, decisions may be distorted.”*

The above does not alleviate the task of statisticians and accountants. On the contrary! It puts a major responsibility on the shoulders of statistics, to develop metrics that can guide policy to a better and more sustainable future. Metrics which are well-founded, based on an underlying conceptual and statistical framework, agreed across various areas of expertise, convincing, and easy to communicate.

Since the 2<sup>nd</sup> World War, national accounts have become very “successful”, GDP and economic growth often being put on a par with success or failure of economic developments, and even more broadly, societal developments. Nowadays, a large part of the economic research community seems to have turned their back to the intricacies of defining and measuring macro-economic data. National accounts also increasingly have become the object of criticism in media and academic research, the most notable recent examples being the measurement of financial services, the inclusion of illegal activities, and the way in which the digitalisation of the economy is being represented. Sometimes these critiques are justified and call for further investigation. In other instances the comments and remarks simply show a certain ignorance of the standards and what they intend to measure, and call for enhanced communication between the research community and the national accountants.

A more substantive body of criticism relates to the measurement of (material) well-being and sustainability. GDP indeed does not take into account various aspects of well-being and does not account for environmental externalities. As such, navigating on GDP alone is the shortest route to disaster. There is an increasing user demand for arriving at better metrics that provide a more encompassing measure of developments in (sustainable) well-being. However, one has to recognise that the latter is a multi-faceted phenomenon, which is not easy to capture in one single headline indicator. Instead of having endless discussions on how such a single metric could be defined and developed, from a statistical perspective it seems preferable to apply a dashboard type of approach, such as the OECD Better Life Index, and try to define and populate an underlying conceptual and statistical framework. To include all these aspects into one consistent (monetary) accounting framework, similar to the system of national accounts, thus arriving at one single measure, is, in my opinion, a mission impossible.

A more feasible approach is to arrive at a consensus on the further enrichment of the central framework of national (monetary) accounts by including and combining a standard range of accounts on environment, health, education and time use. All of these additions need not necessarily be defined in monetary terms, although monetising (degradation of) ecosystems could further support the urgency of dealing with environmental sustainability. More generally however, having more and better data in physical units will already provide an enhanced monitoring framework for further analysis, and can be considered as a pre-condition for developing more refined summary indicators. In the meantime, one should further emphasise, and explicitly communicate, the use of alternative indicators within the system of national accounts, the most obvious being household disposable income and household final consumption. Also the compilation of consistent distributional information on income, consumption, saving and wealth should be pursued with quite some urgency. So, yes, there is a role to play for accounting, and for statistics more generally, and it is by far not a small task and responsibility.

Annex 1. Example of recording of free asset created by a community of people

Contributors		NPISH		Users	
<b>Production account</b>		<b>Production account</b>		<b>Production account</b>	
Intermediate consumption.	0	Output (1)	400	Intermediate consumption.	0
		Output (2)	700		
Value added (net)	400	Depreciation	300	Value added (net)	0
		Value added (net)	0		
<b>Distribution of income account</b>		<b>Distribution of income account</b>		<b>Distribution of income account</b>	
Current transfers	400	Value added (net)	400	Value added (net)	0
Disposable income (net)	0	Current transfers	400	Current transfers	400
		Disposable income (net)	400		
<b>Use of disposable income account</b>		<b>Use of disposable income account</b>		<b>Use of disposable income account</b>	
		Disposable income (net)	400		
		Final consumption	300		
		Saving (net)	100		
<b>Redistribution of income in kind account</b>		<b>Redistribution of income in kind account</b>		<b>Redistribution of income in kind account</b>	
		Disposable income (net)	400	Disposable income (net)	0
		Transfers in kind	300	Transfers in kind	300
		Adjusted disposable income	100	Adjusted disposable income	300
<b>Use of adjusted disposable income account</b>		<b>Use of adjusted disposable income account</b>		<b>Use of adjusted disposable income account</b>	
		Adjusted disposable income	100	Adjusted disposable income	300
		Actual final consumption	0	Actual final consumption	300
		Saving (net)	100	Saving (net)	0
<b>Capital account</b>		<b>Capital account</b>		<b>Capital account</b>	
		Saving (net)	100		
		Investments	400	Depreciation	300
		Net Lending	0		
		Capital stock at the beginning of period t	1600		
		Investments	400		
		Depreciation	-300		
		Capital stock at the end of period t	1700		

(1) Services delivered to NPISH, consisting of an imputed value of 20 hours \* USD 20

(2) Sum of costs, consisting of 400 of investment produced on own account (= deliveries of services by contributors) and depreciation of the free asset created (= final consumption of NPISH)



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