Household Balance Sheets in the Digital Age: What National Accounts Bring to the Table "Beyond GDP"

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Abstract

Some analysts have questioned the usefulness of GDP as an indicator of economic growth and assert that it may be obsolete because it does not reflect welfare andwellbeing. Further, it appears to ignore externalities such as environmental degradation.While GDP has a limited scope, the*System of National Accounts (SNA)* in which it is embedded, provides a framework that can accommodate a broader set of indicators of wellbeing. The *SNA* can provide a range of detailed information on household economic behavior—well beyond the production and consumption of goods and services, as represented by GDP. It recognizes the importance of the full balance sheet, household income and expenditure flows, and the linkages to financial and nonfinancial assets, and liabilities. In this paper, we showcase this by presenting a framework through which an extended range of household assets can be developed through an extended (super) balance sheet. Such information can be presented to highlight characteristics by region, by gender, or distributionof income, and wealth. While in many countries data availability on the household sector is poor, the digital age presents new opportunitiesto analyze household behavior as households produce more services for the market and more granular data become available.

I. INTRODUCTION

The question is often raised as towhether GDP, the widely used and recognized measure of economic growth, has become obsolete because it does not reflect wellbeing and appears to ignore externalities such as environmental degradation. This criticism does not reflect the broad analytical usefulness of the System of National Accounts (*SNA*), of which GDP is only a part, and the ability to extend or link the *SNA*framework to other frameworks to assess social and environmental conditions.

While GDP has a limited scope, the *SNA* in which it is embedded, provides a framework that can accommodate a broader set of indicators of wellbeing. We showcase this by presenting a framework through which household assets and benefits derived, could be assessed.

The multidimensional elements of wellbeingpresented in the Sustainable Development Goals (SDG) do not necessarily provide guidance to policy on how to set priorities for achievement, and how to measure overall progress. For instance, how can or should overall progress be measured if there is progress on some goals and deterioration on others or how should overall progress be measured if progress on individual indicators varies.

This paper presentsa framework by which the *SNA*'s sectoral balance sheet can be expanded to reflect some of the social and environmental dimensions contained in the SDGs. Thus, we seek to link the economic dimensions presented in the *SNA* with a range of social and environmental indicators represented in the SDGs. Such information can also be presented to highlight characteristics by region, by gender, or distribution of income and wealth.

We argue that such a holistic and coherent approach is necessary and increasingly possible due to the growing digitization of household activity and of economic activity, in general. We examine two areas in which digitization may affect the statistics on household activity. Firstly, digitization has facilitated a growth in household wealth by allowing the household to produce and exchange services with other entities, mainly other households. These include services that these households may otherwise have produced for themselves (own-account production of services) or acquired services that they have acquired from corporations.

Secondly, the expansion of data availability, brought about by digitization, has broadened the coverage and facilitated the measurement of household activities. These not only include the services produced by households and acquired by other households, but also the range of environmental and social entities that benefit households.

This paper builds on work already being undertaken on developing expanded definitions of assets and, in this regard,follows the guidelines of existing frameworks on the measurement of assets not including in the *SNA*.

II. THE GLOBAL FOCUS ON MEASURING WELLBEING

The analytical appropriateness of GDP as an indicator of welfare and wellbeing has been widely discussed over the past decade (see e.g. Stiglitz, Fitoussi, Sen 2009;Coyle 2014, 2017). These limitations were recognized by the architects of the *SNA* who also stressed the need to look at a broader range of data to analyze welfare. During the post war efforts to rebuild, GDP was a convenient and standardized metric that served an important role in evaluating economic growth and a country's production capacity. Thus, the growth of GDP was deemed to reflect an increase in individual income, thus leading to the improved wellbeing of a country's citizens. However, it has become clear—especially as economies evolve—that economic growth does not improve lives of all citizens equally. The 'Beyond GDP' movement can be traced back to mid-20th century, but only the most recent work attempts to address the issue of more inclusive measurement of welfare and wellbeing.

The SDGs were adopted in 2016 as a follow-up to the Millennium Development Goals. The purpose of the SDGs is to achieve sustainable development in its three dimensions— economic, social and environmental—in a balanced and integrated manner. They comprise 17 global goals that apply to all countries. These are further broken into 169 targets and 304 indicators to determine the progress towards meeting these goals. The SDGs build upon the achievements of the Millennium Development Goals, which were adopted in 2000 by all United Nations member states. The Millennium Development Goals commitment focused on issues such as health (child and mother mortality, HIV), poverty reduction, gender equality, and education.

The OECD *Better Life Initiative* produces a compendium of wellbeing indicators for developed economies and some emerging market economies. In addition, the OECD produces the "*How's Life?" Report* that includes statistics on the material wellbeing and quality of life (social and environmental factors) of residents of OECD members and partner countries (OECD 2011, 2015). The key improvement of this initiative, introduced in the 2015 edition, is the incorporation of the "sustainability of wellbeing over time" domain. It is based on stocks of natural, human, economic, and social capital to assess the extent to which the capital supports wellbeing now and in the future.In addition, individual countries are increasingly embarking on developing wellbeing indicators based on national factors and considerations[1].

While the SDGs are used as benchmarks for countries to evaluate their progress towards these 17 goals, "How is life?" provides a framework to evaluate wellbeing across domains. The*Human Development Index* (UNDP, 1990) established a benchmark for indicators that can be used in cross country comparisons. In addition, there are several measures of subjective happiness. The *World Happiness Report* (Helliwell, Layard, Sachs 2017) provides a ranking of 155 countries and relies heavily on the self-reported levels of satisfaction and happiness. The happiness index is also disaggregated to six dimensions (e.g. GDP per capita, social support, perception of corruption) and their contributions to the overall score. The disaggregation also highlights the scale of remaining unexplained factors influencing happiness that are not included in the model.

III. *SNA*ASSETS – A BRIEF RECOUNT OF ITS EVOLUTION

The *SNA*is an internationally agreed standard for measuring economic activity based on a consistent set of accounting principles. Social and demographic statistics remain outside the *SNA*; however, discussions regarding the inclusion of some social and demographic

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[1] For example, the Dutch Cabinet has commissioned Statistics Netherlands to compile an annual monitor of well-being. This report is expected to form the basis of the Cabinet's decisions on the state of well-being in the Netherlands and part of the debate on the subject in the Dutch Parliament.

indicators have arisen from time to time since the *SNA* was first released in 1953. The *SNA* has also evolved from a framework of transactions to incorporate statistics on balance sheet items, as a coherent, consistent, and closed system of economic interaction within a given economy. The *SNA* is therefore able to provide a broad set of indicators of economic interaction, beyond the measure of production as indicated by GDP. As part of the consistent framework, the *SNA* shows how wealth is created and accumulated.

The *1968 SNA* discussed the possibility of including accounts on human stocks and flows in the system in the form of a population matrix. The resulting framework would bring together demographic, educational, manpower and other social statistics thathave a bearing on the economic and social characteristics of a population so that the changing structure of that population in terms of these characteristics, can be measured. Therefore, the population matrices would be developed to show population flows (through migration, births, deaths, and so forth) and stocks. The *1968 SNA* saw the goal as linking the two systems based on their common attributes and relationships (*1968 SNA* paragraph 1.91).

Richard Stone (1975) proposed a system of social and demographic statistics to cover statistics on all aspects of social life that may require policy action.[2] The system was designed to show what data are available and useful to analyze the interactions of households with each other and with other units. Stone's framework presented a limited discussion of environmental statistics, because there was ongoing work on the subject that eventually led to the development of the *System of Environmental Economic Accounting (SEEA)*. It also does not cover politics because the difficulty of measurement and analysis.

Stone also illustrated how an accounting framework can be used to describe and understand society. He noted that the three pillars on the analysis of society ought to rest are studies of economic, socio-demographic, and environmental phenomena. Thus, the accounting structure can provide a coherent picture of the stocks and flows of the variables associated with these

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[2] System of Social and Demographic Statistics, United Nations, 1975

phenomena. Stone was of the view that the accounting principles used for national economic accounting could be extended to the broader analysis of society.

IV. THE HOUSEHOLD SECTOR IN THE *SNA*

Consumption constitutes the largest component of GDP (Table I). This consumption is undertaken either by households directly (household final consumption expenditure), by governments (for the community at large), and by non-profit institutions serving households. It follows, therefore, that the dynamics of household consumption expenditure is a major driver of economic activity. The household demand for durable goods (cars, computers, furniture), nondurable goods (food, cosmetics, clothing), and services (entertainment, teaching, carpentry) is a driving force behind the economic growth.[3]

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[3]The 2008 financial crisis highlighted the importance of the household sector. The fall in the household wealth, due to the housing market and stock markets collapse, as well as increased unemployment and overall uncertainty, resulted in a sharp decline in private sector demand. Regardless of the drivers of this subdued consumption (wealth effect, low confidence, uncertainty), this drag on the economy proved to be persistent, making recovery process slow and largely dependent on the uptake in households' consumption.

Table I: Household Final Consumption Expenditure by Region- 2015

(Percent of GDP)

World	58.3
East Asia & Pacific	49.4
Middle East & North Africa	50.3
Europe & Central Asia	56.3
South Asia	63.1
Latin America & Caribbean	65.3
North America	67.1
Sub-Saharan Africa	69.9

Source: World Bank

The *2008 SNA* framework proposes a standard presentation of balance sheets for the household sector, based on the same instrument classification and items used for other sectors of the economy. However, the instruments and items of importance to households are different from what may be important to other legal and social entities.

Table IIpresents an example of a balance sheet of a household showing the typical financial assets and liabilities and nonfinancial assets that may be included. The assets side of the household balance sheet may comprise a limited number of financial instruments, the main one being deposits. Depending on the degree of financial sophistication of the economy, household assets may also include claims on enterprises and investment in financial assets outside pension funds. The nonfinancial assets constitute mainly dwellings and land. The liabilities may comprise mainly mortgages and consumer debt. Households that undertake production for the market may also include other fixed assets on their balance sheet, such as vehicles, machinery and equipment, and inventories.

The *SNA* excludes from production, services produced by households for its own consumption. Thus, the inclusion of goods produced on own-account, but the exclusion of domestic services, remain at the core of the *SNA* production boundary. The exclusion of household services from the production boundary was not based on strong conceptual grounds, but was a practical matter. The primary reason is that the cost of these services could not be easily measured because these services are provided for free or cannot be easily differentiated from the activities related to living (Stone, 1984).

Table II: Household Balance Sheet (*SNA*)

ASSETS	LIABILITIES
Financial assets - Currency and Deposits (savings) - Equity (stocks, bonds, other securities) - Insurance reserves/Pension entitlements - Other financial assets	**Liabilities** - Loans (Mortgage, credit card debt, student loans, other consumer loans) - Other liabilities
Non-financial assets - Owner-occupied Dwellings - Other real property - Other non-financial assets	**Net worth** Total *SNA* assets <u>minus</u> total *SNA* liabilities

V. THE EXPANDED ASSETS BOUNDARY

The *2008 SNA* defines assets as "...entities that must be owned by some unit, or units, andfrom which economic benefits are derived by their owner(s) by holding or using them over a period of time" (*2008 SNA*paragraph 1.46). Thus, this definition identifies two critical criteria for determining an asset: (i) ownership by a unit or units; (ii) the ability to provide economic benefits. The identification of ownership may be relatively straightforward for financial assets and produced assets because there are identified with a specific unit (household or legal entity) when they are created or acquired. However, in terms of non-produced assetssuch as natural resources, identifying or assigning ownership may not be so clear-cut because, in addition to not being the subject of a production process, the entity may be immovable, and therefore not deemed to be exchangeable. Therefore, in identifying non-produced assets,the focus on whether the institutional unit is able toestablish effective ownership and therefore benefit from these assets. The scope of financial assets is not affected by the broaden of the asset boundary; therefore, the focus is on produced and non-produced non-financial assets.

The production and assets boundaries of the *SNA* preclude the inclusion of social and some environment indicators. Therefore, the measurement and assessment of these indicators based on an *SNA* framework would necessitate an expansion of the *SNA* production and asset boundaries.

The criterion that the entity must be subject to ownership by a unit or units to be considered an asset may not hold for social and environmental entities that are not subject to ownership, or that are owned by the society as a whole[4]. However, the fact that the entity is not subject to ownership does not preclude households from legally receiving benefits from these

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[4] The balance sheet of the household sector for a given economy is an aggregate of the balance sheets of the individual household units. Therefore, assets owned by the community and that provide benefits to households are not included in the assets of the household sector.

entities. In addition, entities that are owned by the society and that provide benefits to households are not reflected on household balance sheets. Therefore, cross country comparisons of household assets may understate the benefits derived by households for economies where household ownership of assets is low. In this case, the overarching criterion is whether the entity can provide an economic benefit to the household.

Consumer durables are not considered household assets in the *SNA*, but are considered household final consumption expenditure. In this regard, consumer durables, are recorded in the use of income accounts as flows, and not as stocks in the balance sheets. Households with unincorporated enterprises may also include some fixed assets; however, this may be small and represent a very small fraction of overall household assets. The classification of consumer durables as expenditure coincides with the function of households as being consumers and not as producers, as are corporations. The inclusion of consumer durables in the SNA assets boundary also implies that household services on own account be included, thereby expanding the SNA production boundary.

Based on this restriction, consumer durables and human capital are not considered capable of bringing economic benefit to their owners and are not considered assets. The *2008 SNA* notes further, "…consumer durables are not regarded as assets in the *SNA* because the services they provide are not within theproduction boundary. Human capital is not treated by the *SNA* as an asset as it is difficult to envisage "ownership rights" in connection with people, and even if this were sidestepped, the question of valuation is not very tractable".

Thus, the asset boundary is extended to account for entities over which ownership rights are not established and are therefore not liable to being exchanged. In this regard, the overarching criterion is whether the entity can provide an economic benefit to the household.

In this paper, we follow the *2008 SNA* definition and scope of households as "…a group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food".The scope includes institutional households. In addition, the production

activities of households that generate income from units are also included in the household sector, if the production income or the related financial transactions cannot be differentiated from the other activities of the household. The production activity is therefore deemed to be undertaken by a household unincorporated enterprise.

Thus, based on the expanded scope of assets that is used in this paper, and the concomitant expanded scope of the production boundary, it is expected the activities of households would increase substantially, although there is no change in the scope of households.

VI. A FRAMEWORK FOR HOUSEHOLD ASSETS

The extended balance sheet framework is presented in the form of satellite accounts analysis for the household sector that would seek to take account of indicators of the SDGs. The *2008 SNA* recognizes two types of satellite accounts analyses and the type used in paper as recognized by the *2008 SNA* is based on the use relaxed or amended SNA concepts. In this case, the scope of assets—and by necessity the production boundary—is expanded. The proposed approach seeks to adhere to the principles of the *SNA* accounting framework. The use of a satellite accounting framework therefore allows for conceptual variations from the central framework of the *SNA*.

The extended balance sheet is not designed to be an all-encompassing framework for the SDGs and may not produce a linear relationship. Thus, components of the balance sheet may address a cross-section of SDGs. Further, the extended balance sheet will not represent all the SDGs and will also present balance sheet items for which data are available. As data evolve, the system can be expanded and would may encourage analysts to decide, along the way, how to account for the various indicators.

As a first step, we propose the inclusion of consumer durables as the assets of households. The inclusion of consumer durables in the asset boundary is in line with the expansion of the production boundary to include household services provided to other households. With the expansion of the "sharing economy", consumer durables are playing an increasingly important role in generating household income and improving household wealth. There has

been quite a lot of interest and work on including consumer durable goods in household assets and the effect on wealth. The *Canberra GroupHandbook on Household Income Statistics*(2011) includes the services from consumer durables in the conceptual definition of income, which implies that consumer durables are to be treated as household assets—like dwellings—that produce these services.

Recognizing the importance of this information for policy analysis, the *2008 SNA* recommends that statistics on consumer durables be included as a memorandum item to the balance sheets. Some advanced economies have varied from the *SNA* recommendations by including consumer durables as assets in the balance sheets of the household sector. Thus, increased expenditure of consumer durables is not seen simply as a means to increase household consumption, but also a means of facilitating household production.

The inclusion of human capital and demographic statistics in the *SNA*framework was discussed during the preparation of the *1968 SNA*. However, the idea was shelved, in part, due to the lack of data and a measurement framework. Both the *1993 SNA* and *2008 SNA* acknowledge the importance of human capital but stress its incompatibility with the *SNA* definition of assets and the difficulties that valuation and measurement may pose.

The measurement of human capital as assets is addressed in the *Guide to Measuring Human Capital (2016),* which puts forward a framework for its measurement. It only considers human capital developed through educational attainment and job-related training. The importance of own-account services isrecognized as the Guide extends the *SNA* production boundary to include own-account training.

The extended balance sheets also include environmental assets as households receive a range of benefits from the environment. The *SEEA* presents a comprehensive system of flows and stocks that describes the relationship between the economy and the environment. It uses the concepts, framework, and principles of the *SNA*as a basis to compile physical accounts and tables, and assets accounts for natural resources. The *SEEA* therefore allows for the

integration of the physical components of environmental information with the monetary framework used for economic statistics.

The SEEA defines environmental assets as the *naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity (2012 SEEA paragraph 2.17).* The definition therefore covers assets that are naturally occurring in the environment as well as environmental assets that have been transformed by economic activity. or they may be Although they are naturally occurring, many environmental assets are transformed to varying degrees by economic activities.The SEEA therefore extends the *SNA* asset boundary to not only include assets under the ownership and control of an institutional unit, but all naturally occurring assets that may provide benefits. It therefore does not follow the requirement that the entity must be able to provide economic benefits to its owner.

The framework of the extended balance sheet is expanded further to include other social assets. The inclusion of these assets is based on the ability of households to access the benefits. This access is therefore an indicator of future consumption where future consumption is the stream of benefits that can accrue to the household as a result of owning (as a society) and using the asset.

The range of assets that may be included is potentially broad; therefore, the scope of assets is restricted to produced assets and non-produced assets for which a valuation is available. The extended (super) balance sheet may include therefore include a range items that may be limited to facilitate cross country comparison or expanded based on the set of countries being considered.

Table III. Extended (Super) Balance Sheet of Households

Assets	Liabilities
Financial assets - Currency and deposits (savings) - Equity (stocks, bonds, other securities) - Insurance reserves/Pension entitlements - Other financial assets	**Financial Liabilities** -Loans (Mortgage, credit card debt, student loans, other consumer loans) -Other liabilities
Non-financial assets - Owner-occupied dwellings - Other real property - Other non-financial assets - Consumer durables - Human capital - Access to energy (renewable) - Access to water - Access to clean air (air emissions) - Access to communication * - Access to transportation * - Access to other infrastructure * - Access to work * - Mental wellbeing *	**Net worth (Super Balance Sheet)** Total Assets (*SNA* assets <u>plus</u>extended assets) <u>minus</u> total *SNA* liabilities

* Denotes extensions beyond existing frameworks.

THE DIGITAL ECONOMY AND THE ROLE OF BIG DATA

Development of an extended balance sheet of environmental and social statistics requires a range of data on the activities of individual households. The increasing involvement of household in digitization has presented a range of possibilities for collecting data on household activities and in this section, we provide some illustrations rather than a systematic discussion of how the super balance sheet data would be compiled.

Increasingly detailed, high frequency, and timely information about households will, over time, allow virtually instantaneous estimations of household wealth. Household surveys have been a common method for collecting these data, but it is time consuming and expensive. Other administrative data may be less resource-intensive and more timely, but limited in scope and usually not available to researchers, or other governmental organizations. The digital revolution has extended the boundaries of data computing, processing, and availability beyond expectations.

For example, geospatial data, data (satellite imaging, GPS, geotagging), can be used to evaluate changes in the environment. It is now used in predicting droughts and measure distribution of water. On the local level, it is possible to use geospatial data to assess the quality of living by estimating the number of trees in a neighborhood.

There are many other environmental indicators that have a direct effect on a household wellbeing. In the Polish city of Cracow, sensors around the city measure air quality. Citizens can check air pollution levels in their specific areas in real time. In Seoul, Korea, municipal water utilities provide information on the quality of water at the number of intakes, reservoirs, pumps, and taps.

Information on health, traditionally relying on records that can be obtained from hospitals, and other healthcare providers, access to insurance claims can be supplemented by devices such as Fitbit and iWatch which perpetually collect data about individual behaviors and activities. These wearables provide a constant stream of data about habits that previously would require long and invasive interviews.

The measurement of human capital, traditionally proxied by years of education can be supplemented using average test scores. Higher average scores indicate better schools that create better opportunities for their students, and, therefore, households would record an increase in assets in line with higher scores. Professional social media are another potential

source of information about human capital. Quantifying the number of connections or recommendations on LinkedIn or Xing delivers data on current and potential employment.[5]

VII. CONCLUSION

The SNA provides a framework that can accommodate a broad set of indicators. Balance sheets provide information on net wealth, an important "bottom line" that provides guidance to policymakers on how to measure progress. This paper proposes the development of an extended SNA-based "super balance sheet" for households to accommodate multidimensional indicators of economic and social wellbeing as presented in the SDGs. The development of such super balance sheets is made possible by, the increasing digitalization of the economy and the participation of households in the digital economy. By the same token, more granular data improves the scope to measure activities and wealth previously considered too difficult to be measured. This paper focused on the household sector but similar extensions can be developed for the other sectors of the economy, particularly the corporate and government sectors.

Expanded net worth provides a more comprehensive description of the household's wealth. The expansion of the production and assets boundaries will lead to higher estimates of household production, assets, and hence household net worth for some households. For global comparisons, the super balance sheet will highlight the state of global inequity and its evolution over time. For example, while access to water is virtually universal in advanced economies, in low income countries, significant strata of the population do not have access to

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[5]Big Data create opportunities but have significant pitfalls as well. The data properties may be misinterpreted, wrongly coded, or just wrongly analyzed leading to false results. Surface level interpretation and questionable data validity often taints the outcomes. Privacy is another issue the researchers and policymakers face when working with Big Data. Individual health, internet browsing, current debt level, or even the next purchase can be precisely inferred from available data. It is much harder to maintain the level of privacy.

water. Linking the SNA with sustainable development indicators can be a powerful tool for policy analysis.

Ownership of consumer durables enhances the household's ability to engage in household production. The super balance sheet will generally increase the ratio of non-financial assets to financial assets. In general, the super balance sheet will highlight that social and environmental advantages are reflected in higher net worth.

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