

Methodological foundations of the Satellite Account of Information in the System of National Accounts

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1. Why the satellite account of information in the SNA?

- 1.1. **Modern society** is often described by the term "**information society**". **Modern economy** is often described by the terms: **post-industrial economy, information economy, digital economy, electronic economy**. The "common denominator" of all these terms is **information**. The role, function, and economic importance of information are the *differentiae specifica*e of modern societies and modern economies in comparison with traditional, pre-industrial and industrial economic systems.
- 1.2. In modern post-industrial, information-based economies:
 - information is the basic economic asset of national and global economy ,
 - information is one of the most important and indispensable factor of production of goods and services,
 - technological progress is "information-driven", i.e. (1) for developing new technologies and products, huge volumes of information are required, (2) the results of technological progress are information, (3) implementing results of technological progress requires high volumes of information,
 - information component is the essential segment of all high-tech products; the higher is the technological level of the product, the more information it "contains", and the more information is needed for its production and use,
 - information infrastructure of national economy is the prerequisite and the basis of social and economic progress; the level of development of information infrastructure of the country as an indicator of the level of social and economic development of the country,
 - individuals, households and businesses need large volume of information for their existence and for proper functioning in the economy (social and economic "information minimum"), the more developed is the economy, the more higher is the "information minimum",
 - information sector in the economy is very large and growing sector of the national and global economy,
 - some areas of information are or should be considered as public wealth,
 - in new economy the information is the basic raw material, mean of production and product,
 - mass production of information for consumption and consumption of information are important economic activities,
 - information market is the specific segment of national, supranational and global economy,
 - global, supranational and international information systems have direct impact on the development of national economies,
 - information infrastructure of national economy and its technological level is decisive for the position of the national economy in global market.
- 1.3. In modern economy the role of information may be compared with the role of energy. All individuals and businesses have to be supplied continuously by information for all their lifetime. Any disturbances in delivering necessary information disorganize the activity and functioning of individuals, households, governments and businesses.
- 1.4. In modern economy the expenditures for information are significant and growing part of all costs, which must be paid by all economic units and individuals. For each activity the social and economic minimum of information may and should be identified. The governments, companies and household should know, what are the necessary outlays and expenditures for information component of their activities. Optimization of costs of information is becoming and important criterion of any economic and social policy.
- 1.5. In "classic" central schema of the SNA it is not possible to define, classify and to measure the information as economic category, economic wealth and value of information. The satellite account of information is predestinated to define specific economic categories and statistical indicators to fill this gap.

2. Satellite account of information in the structure of the SNA

- 2.1. The SNA¹ is based on the following basic concepts: (a) national economy, (b) economic transaction, (c) institutional unit, (d) productive activity, and (e) economic assets. On the basis of these concepts many derived terms, concepts and indicators for measuring quantities and values of economic objects, subjects, phenomena and processes have been developed. GDP (Gross Domestic Product) was chosen as the basic aggregate representing the level and dynamics of economic development. Income accounts (primary, secondary), capital accounts and financial accounts form the platform of the SNA. These accounts compose the central system or central framework of national accounts in the SNA. They are developed for the national economies as a whole, for regions (regional accounts), with yearly and quarterly periodicity (yearly and quarterly accounts).
- 2.2. However, it has become clear, that economic transaction based approach is not sufficient for analysis and evaluation of many important aspects of the economies. The SNA does not claim that its categories and concepts are in all cases the only right ones. Additional or different requirement of real economy, of its particular sectors, necessitate the development of complementary or alternative categories and concepts². "Satellite accounts or systems generally stress the need to expand the analytical capacity of national accounting for selected areas of social concern in a flexible manner, without disturbing the central system. Typical satellite accounts or systems allow for:
 - (a) The provision of additional information on particular social concerns of a functional or cross section nature;
 - (b) The use of complementary or alternative concepts, including the use of complementary and alternative classifications and accounting frameworks, when needed to introduce additional dimensions to the conceptual framework of national accounts;
 - (c) Extended coverage of costs and benefits of human activities;
 - (d) Linkage of physical data sources and analyses to the monetary accounting system." (SNA93, 21.4.)
- 2.3. Most important reason of introducing the satellite accounts into the SNA is that the basic SNA concept of a *market driven transaction* is "short-term" and "local", representing the value of assets, incomes or costs for the moment or period of transaction. The concept of transaction does not represent the value of economic assets or economic outputs in long term, for the national or global economy as a whole. E.g. the value of non-renewable natural assets, the value of historical monuments or natural environment, on which the activity tourist sector of the economy is based, the economic value of high level of education of population can not be measured on the basis of transaction on the market.
- 2.4. Here are the examples of the areas for which the SNA satellite accounts are proposed and developed:
 - 1) Satellite system for integrated environmental and economic accounting
 - 2) Satellite account of government activities
 - 3) Social satellite account
 - 4) Satellite account for tourism
 - 5) Satellite account for agriculture
 - 6) Satellite account for research and development

In information economy and in information society it is necessary to develop new satellite account - the *account of information*.
- 2.5. The objective of the *satellite account of information* is necessary to help governments to define and establish the frames for *information order* and criteria for the development and maintenance of information infrastructure of the economy. The satellite account of information may also help businesses and other subjects of the information sector of the economy to evaluate and define their policy and activity on the market, with special reference to the market for information. The categories and concepts elaborated within the satellite account of information are necessary to explain the functioning of modern economy, also some phenomena of the new "economy".
- 2.6. The *satellite account of information* should help to answer the following fundamental questions:

¹ See: *System of National Accounts 1993*, Prepared under the auspices of the Inter-secretariat Working Group on National accounts, Washington D.C., 1993.

² Op.cit. p. 489 r

- What is the share of outlays for information in the economy, in branches, types of economic units, in GDP (e.g. for benchmarking, for international comparisons),
- What is the economic efficiency of outlays for information,
- What is the "economic redundance" of information,
- What are the outlays necessary for economic development
- How to minimize excessive costs of information,
- How to "recycle" the information and how to eliminate the "information garbage" etc.

3. Basic concepts of the satellite account of information

3.1. The specificity of information is that it does not exist as a material product, but it is always strictly integrated with some information processes and systems. For identifying and measuring information it is necessary to define the concepts and classifications of:

- (a) information,
- (b) information processes,
- (c) information systems,
- (d) information sector of the economy,
- (e) information market,
- (f) information infrastructure.

3.2. For proper evaluation, interpretation and use of information, for each set of information in any information systems the following basic functions based on utility criterion of information should be identified:

- a) **representation of real world** (e.g. political news, good statistics)
- b) **extension of knowledge** (e.g. scientific paper) ,
- c) decision making (e.g. weather forecast, stock exchange data),
- d) control (e.g. advertisement, political propaganda),
- e) consumption (e.g. "Big Brother" in TV, color magazines for ladies and teen-agers).

Each set of information may realize one or more than one function.

3.3. **Knowledge** is the information, which realizes function (a). Optionally it may realize other functions too. Special interest is paid to the information realizing function (b). The functions (c), (d), (e) may be realized by information which do not meet the quality requirements of representing the reality and extension of knowledge. Optimum is when a set of information can realize all 5 functions. Modern IT help to extend the multi-functionality of information.

3.4. The information as an economic category, based on the criterion of the economic role of information in the economy should be considered as:

- Information as an economic asset,
- Information as a public wealth,
- Information as a production factor,
 - Information as "raw material" for production,
 - Information as mean of production,
- Information as a consumption good,
- Information as a product ,
 - Information as goods,
 - Information as services,
- Information as a market commodity,
- Information as an infrastructure of the economy.

4. Information as an economic asset

4.1. Defining and measuring the information as an economic asset is the fundamental methodological problem of the SNA satellite account of information. In the central framework of the SNA information as an economic asset is "hidden" under the term **intangible fixed assets**. Explicitly in the SNA only very few types of information are explicitly specified as the **economic assets**: computer software, original artistic, literary and entertainment works. Such evident information assets like patents, copyrights, etc. are put to the class AN 1123 Other intangible fixed assets.

- 4.2. For the *satellite account of information* one should define, what information is an economic asset and what information is not. **Information as an economic asset is any potentially useful files of information and metainformation represented in a language of end-users, stored in place, time, using the organization, economic conditions and technology, enabling to access pertinent information and to utilize accessed information by end-users acting as economic units.** Information as an economic asset should realize at least two following functions: (a) representation of the real world, (b) extension of knowledge of users.
- 4.3. Information produced for consumption only, but not representing the reality and not extending the knowledge, should not be considered as an economic asset. Also the information, which is not accessible in proper time, place, technology or language, is not an economic asset either. Information, which does not meet respective quality requirements (e.g. not updated, incomplete, erroneous) should not be an economic asset too.
- 4.3. The following types of information assets as economic assets may be specified:
- general knowledge,
 - professional skills,
 - infrastructural information resources of the economy,
 - infrastructural information systems of the economy,
 - information resources of economic and social units,
 - resources of the information sector of the national economy,
 - information resources of international and supranational systems and organizations available and accessible for the national economy and its units.
- 4.4. For each type of information assets, specific statistical indicators for measuring the quantity and value, weights representing utility and quality of information and the indicators measuring the expenditures for the creation and maintenance of information assets in the economy should be defined. However, official statistics has only developed some indicators measuring the expenditures for information and costs of information.
- 4.5. Satellite account of information should also help to identify what should be the information infrastructure of the economy and what outlays should be devoted to its maintenance and development.

5. Extraction and measurement of the information component of assets, products and transactions

- 5.1. Information in the economy is represented in the following forms:
- a) physically identified files of information (e.g. Proceedings of the ISI 53rd session in Seoul, books, newspapers, statistical data on CD, TV program),
 - b) organizationally, economically and legally identified information systems which are consisting the information sector of the economy (e.g. national education system, national system of official statistics, CNN, consulting company, national library),
 - c) information resources and systems which are integral parts of the units of economy: governments, enterprises, universities research institutes, etc. (e.g. tax information system, information system of insurance company, stock exchange, bookkeeping system of a company)
- 5.2. The outlays for (a) and (b) could easily be measured, if relevant changes and extensions in the classifications of activities (ISIC, NACE), products (CPC, CPA), are introduced. The measuring of outlays for information (c) requires respective change classifications used administrative records of the units.
- 5.3. Facet classification of information and information systems: 1) by utility functions (see 3.2.), 2) by types (see 4.3.), 3) by economic role (see 3.4.) seem is necessary for defining the basic schema of the satellite account of information.

References:

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- (2) Olenski J., *Foundations of economics of information*, (in Polish), Warsaw University, Warsaw 1999.
- (3) *System of National Accounts 1993*, ed. United Nations ea., Washington D.C., 1993.