



93rd DGINS Conference
20–21 September 2007, Budapest, Hungary



DGINS 2007/93/I/7

**Challenges for National Accounts and Balance of Payments statistics:
Goods sent abroad for processing**

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One item in the present round of SNA¹ revision concerns the recording of *processing*, or manufacturing of goods on contract or fee basis. Two requirements may in this respect be pointed at; one is the need for a consistent system of cross border transactions and financial flows, and the other is a relevant description of the economic activities within the national boundaries. The conclusion taken in UN's Statistical Commission [1] changes the prevailing recommendation of gross recording of processing, based on the fact that processing implies that no change of ownership to either raw materials or finished goods takes place. This note argues that the change in principles makes the Supply and Use Tables of the SNA less suitable as fundament for analyses of production, productivity and environmental issues related to production, and advocates for the introduction of a new satellite accounts system specially designed for such analytical purposes.

1. Introduction

Production is a core economic activity, and the access to produced goods and services constitute a fundamental pillar of the welfare or well being of a nation's population. The System of National Accounts (SNA) [2], as the main statistical tool in analysing a nation's economic life at the macro level, should be designed in such a manner that production processes and the results thereof can be thoroughly studied and understood.

A general and acclaimed property of the SNA is the consistent way in which the data are presented, achieved by using a uniform set of definitions and accounting rules throughout the system. This quality of SNA is, however, not to be understood as the existence of an *a priori* given characteristic of the system. The (consistent) set of definitions of the SNA is a result of

compromises, reflecting the well-known fact that many economic phenomena can be approached from different analytical angles and thus be subject to different definitions.

Processing is a concept mainly connected with cross-border transactions and covers the situation when an institutional unit resident of country A ships raw materials to country B for processing, i.e. transformation into a finished good, which in turn is shipped back to country A, and the *ownership of both the raw materials and finished goods all the time is with the institutional unit resident of country A.*

The recent recommendation (SNA rev. 1) of changing the recording of processing from a gross to net basis is done to strengthen the institutional dimension and anchoring of the National Accounts. At the same time, however, it makes the accounts less suitable for input-output analyses and for tracing real trade flows.

2. Production in SNA93

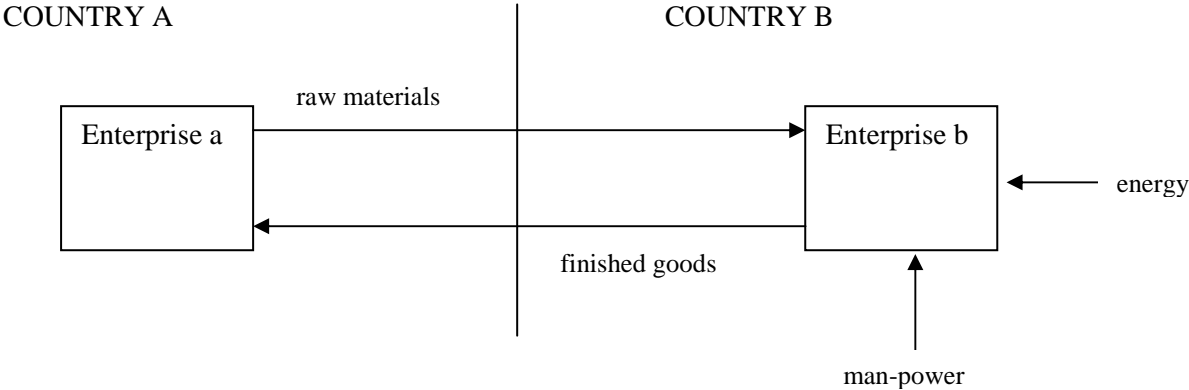
Production is in the SNA93 described both in the *institutional sectors accounts* (ISA) and in the *supply and use tables* (SUT). The ISA present the production process as an integral part of a comprehensive and coherent set of accounts describing economic processes from production and income generation, to use of income and saving, and framed by opening and closing stocks. The definitions of the basic national accounts concepts (i.e. economic units, economic flows, and economic values) in this part of the system follow the *institutional* model, emphasizing the institutional environment in which the economic life is organised. In this environment the concept of legal *ownership* to economic resources is fundamental.

SUT is on the other hand introduced as an integrated part of the SNA93² to serve as a detailed database accommodating consistent production and productivity analyses, i.e. the production of goods and services taking place in industries by combining raw materials and energy, manpower and fixed capital. In a broader scope SUT give a detailed mapping of all commodity flows within an economy and with the rest of the world. Here, the institutional environment in which the production takes place is of less importance. In other words, the SUT should follow the *real product flow* model, by describing goods and services production

processes *regardless* in which institutional environment it takes place and hence with less attention paid to legal ownership to production factors and the finished products.

On this background, the SNA93 in the case of processing made a compromise by recommending an *imputed change in ownership* and thus *gross* recording of goods sent abroad for processing (see figure 1). For the same reason financial leasing is recorded according to the *user principle* and thus imputing a change in ownership to capital equipment.

Figure 1. Processing, gross recording.



This duality in the description of the economic life of a country, i.e. institutional economic phenomena versus real economic phenomena, has been an ever present issue within National Accounts thinking from its infant days as represented by the Anglo-American tradition (Stone) and the Scandinavian tradition (Frisch/Aukrust) [3]. The two traditions reflected both differences in availability of and access to source information, but also differences in principle thinking of what analytical needs the National Accounts data should serve. Thus the solution chosen in SNA93, i.e. the SUT serving the needs of production, productivity and input-output analysis, and the ISA the needs of economic analysis of the totality all of economic processes and economic behaviour was an acceptable compromise.

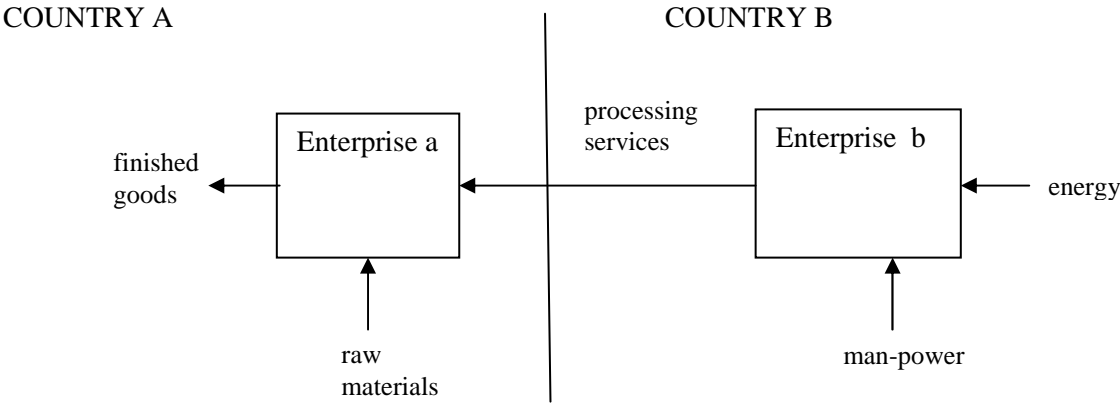
3. Processing in SNA Rev. 1

However, in the case of processing, the SNA93 Rev.1 will reverse the current recommendation by allowing *no imputations for change in legal ownership*³. Goods processed or manufactured on a contract or fee basis are to be recorded as if no actual transactions in goods takes place, i.e. all traces of the physical movements of goods in the case of processing will be wiped out in the National Accounts.

The institutional model or net recording implies that country B according to National Accounts do *not* produce goods and do *not* consume raw materials in its production (see figure 2). Thus, the National Accounts of country B will describe *services* production activities (processing) employing manpower and a fixed capital stock *geared towards goods* production. The opposite will be the case for country A; the National Accounts will show production of goods *lacking the related employment or fixed capital stock*.

This change in principles, with in effect less prominence given to technological aspects of the production processes, has implications for the analytical use of the SUT in production and productivity analyses, by blurring the description of the relationship between output and the use of production factors, including energy and manpower.

Figure 2. Processing, net recording.



In net recording the processing service produced by enterprise b, is used as intermediate consumption in enterprise a, which in turn is deemed to be the producer of the processed (finished) good. Labour force surveys will on the other hand record employment scaled towards goods production in enterprise b and not in enterprise a, and thus influence the consistency between National Accounts and Labour Force statistics in a negative way. The same type of asymmetry will apply to the use of energy or other input factors in the production of the goods.

Another consequence is that the link between production data of the National Accounts and *environmental* indicators might be less meaningful without the National Accounts reflecting a physical description of the process of producing goods and services. For example, data on emissions and waste from use of specific types of raw materials in various manufacturing industries will be inconsistent with the detailed commodity flows of the National Accounts, and thus the link between the National Accounts and the System of integrated Environmental Economic Accounts (SEEA) will become more diffuse and problematic. Statistics on emissions to air or other elements will record the emission in the country where they physically occur, which will be a different country to where the National Accounts says that the goods production takes place.

Furthermore, the National Accounts' description of the link between physical movement of goods and the use of goods freight will change, making the National Account less useful as data base for transportation analyses.

4. Conclusions

The discussion on the National Accounts' description of real economic phenomena versus institutional economic phenomena is an old one, and an acceptable compromise was reached in the SNA93. In the forthcoming SNA Rev. 1 the recommendation of recording goods for processing on a gross basis is however, changed in favour of net recording, thus shifting the focus towards an institutional perspective.

These changes in the National Accounts call for the development a new and supplementary system maintaining the former SNA's mapping of real economic phenomena needed in many economic analytical contexts. Within what framework such a system best can be developed,

an extended SEEA system or a *new satellite accounts system* for production and productivity analysis, must be subject to further considerations. It will anyhow have to be based on the real product flow model have to take on board the ambitions and aspirations of the former SNA, adapting SUT to production and productivity studies and strengthening the link to important fields such as employment, energy and environmental analysis.

The new supplementary system should record processing on a *gross basis*, showing the cross border transactions in raw materials and finished goods, and in this way facilitating analysis of

- The link between the domestic goods production and domestic employment according to the Labour Force statistics, and between goods production and the use of fixed capital, thus accommodating consistent production and productivity analysis.
- The link between goods production and energy consumption as presented in Energy Accounts and Balances.
- Environmental issues by combining National Accounts data on output and other economic variables, and environmental indicators and data on emissions and waste from the industries.

5. References

[1] United Nations Statistical Commission (2007): Report on the thirty-eighth session (27 February to 2 March 2007), *Economic and Social Committee Official Records 2007, Supplement No 4*. New York.

[2] Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank (1993): *System of National Accounts*. Brussels/Luxembourg, New York, Paris, Washington D.C.

[3] Vanoli, André, 2005, *A History of National Accounting*, (IOS Press Amsterdam)

¹ System of National Accounts, current version published 1993, revised version to be published 2008.

² Initially introduced in the SNA68.

³ Surprisingly this seems not to be the case with financial leasing, as no change in principle is suggested here.