Extracts from “Symmetric Input-Output Tables: Compilation Issues” Paper prepared for the Fifteenth International Input-Output Conference 27 June – 1 July 2005, Beijing, China by Bent Thage:

Extract One:
Chart 1 illustrates the four standard methods set out in the *1968 SNA* for deriving SIOTs from the SUT. According to the SNA there are two types of tables, product-by-product and industry-by-industry tables that each can be derived using either the assumption of a product technology (assuming that a product has the same input structure in whichever industry it is produced) or the assumption of an industry technology (assuming that all products produced by a particular industry have the same input structure). Application of the product technology assumption will usually result in some negative elements that afterwards have to be eliminated by introducing additional assumptions and/or data.

Chart 1. The four alternative symmetric input-output tables in the *1968 SNA*

	Product-by product table	Industry-by industry table
Product Technology	(a) Negative elements	(b) Negative elements
Industry Technology	(c) No negative elements	(d) No negative elements

These standards methods are also discussed in summary form in the *1993 SNA* and the *1995 ESA*, and in more detail in the UN *Handbook on Input-Output Tables* (1999).

It has been pointed out that the terminology first introduced in the 1968 SNA is misleading, when the term “technology” is used also in connection with the construction of a SIOT of the industry-by-industry type from supply and use tables (SUT)[1]. An overview of the revised terminology used in this paper in is shown in *chart 2*. The main distinction is not between two technology assumptions, but between technology assumptions on the one hand, and sales structure assumptions on the other. With this distinction the boxes that contain product-by-product tables based on sales structure assumptions, and industry-by-industry tables based on technology assumptions become empty**.** The two types of standard tables (b and c) are not considered further in this paper, as it is difficult to find any rationale for them, except that they can be mathematically derived by the same procedure that leads to tables (a) and (d).

Chart 2. An alternative terminology for symmetric input-output tables.

	Product-by product table	Industry-by-industry table
Technology		Empty
Product technology	(a) Negative elements	
Industry technology	(b) No negative elements	
Sales structures	Empty	
Fixed product sales structures		(d) No negative elements
Fixed industry sales structures		(b) Negative elements

[1]Konijn P.A. and A.E.Steenge: *Compilation of input-output data from the national accounts*, Economic System Research, no 1, 1995.

Extract two:

Although the formal characteristics of the four tables (a)-(d) in the two charts remain the same, the criteria for the choice of compilation method becomes more transparent in chart 2. Thus, it is seen that the industry-by-industry table based on the fixed product sales structure (d) does not involve any technology assumptions (as do a and c), and does not require additional assumptions or data sources to adjust for negatives (as do a and b)[2]. Furthermore, table (d) retains the links to the national accounts data and basic statistics, and compilation is less resource demanding. It should also be noted, that the *overall sales share* in a row is not based on an assumption, but actually observed. The assumption only concerns the break-down of the individual row elements. Even if this assumption is not fulfilled at the element level this will only marginally affect the analytical properties of the resulting table. These points are elaborated in the numerical examples below.

The market share assumption represents the minimum manipulation of data that will lead from the SUT to the SIOT. This was the method generally used to construct SIOTs before the 1968 SNA terminology was introduced, and this is still the preferred method in those countries where IO tables are compiled on a current basis as an integral part of official statistics.

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[2] In the theoretical literature (most recently T. ten Raa and J.M. Rueda-Cantuche "The Construction of Input-Output Coefficients Matrices in an Axiomatic Context: Some Further Considerations,", *Economic Systems Research* 15, 2003) the fulfilment of certain axioms (material balance, financial balance, scale invariance, and price invariance), have been seen as defining criteria that can be directly used in the compilation of the SIOT from the SUT. The results of these theoretical exercises depend, however, on the assumption that the real world can be correctly depicted by a limited number of homogeneous products that are produced with a similar number of unique production functions that are defined in terms of their inputs of these products. It is, however, not possible to generalise these theories to the real world case, where many products with different input structures are produced by each activity, no matter how narrowly defined. The theoretical foundation of the above "proofs" has recently been challenged in Louis de Mesnard: *On the consistency of commodity-based technology in the make-use model: An Economic-circuit approach* (Paper presented at the 14th IO-Conference,Montreal Canada, 2002).
Basically such axioms are necessary assumptions for carrying out input-output *analysis,* and as such they can be assumed to be valid no matter how the input-output table has been constructed. In this respect they are of the same type as many other simplifying assumptions that must be made before any economic analysis can take place (linear expenditure system, constant elasticity production functions etc). Such assumptions do not apply to the data compilation.