

Development of Input-Output Tables in the Czech Republic¹

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Abstract

Input-output tables represent a powerful tool for economic analyses. Even the tradition of symmetric input-output tables is long in the Czech Republic, the number of skilled domestic users is relatively low. It means that they are widely used by foreign universities and research centers. It is partly due to the missing education in this area at universities and partly due to the insufficient information in Czech scientific journals. The aim of this paper is to briefly present a history and availability of Czech input-output tables and description of their possibilities for economic analyses. Since a very fast development of both economy and economics, the system of national accounts is being revised. It means that beside core sector accounts, input-output tables will be updated, as well.

Keywords

Input-output tables, material product system, system of national accounts, gross domestic product

JEL code

E01, C02, N01

INTRODUCTION

Input-output tables are one of the key parts of the System of National Accounts (SNA) since 1993 when an UN standard SNA 1993 was established. European modification ESA 1995 took over main principles and current input-output tables should be fully consistent with sector accounts. Implementation of input-output tables into national accounts was firstly introduced in SNA 1968. Input-output tables have a long history and they are tightly linked with famous Nobel Prize laureate W. Leontief since 1930s. They were originally designed as a tool for economic description and analysis and subsequently they have gained more purposes. Input-output tables currently cover classes of two³ main models. The first class contained historically popular symmetric input-output Tables (SIOT) and the second class is covered by supply and use tables (SUT). Symmetric input-output tables have still the same group of users focusing on economic models. Contrary to them, supply and use tables are used mainly by statistical offices for checking data quality, commodity balancing and deflation.

Input-output tables offer a large amount of information about the economy and therefore they are very popular among the most qualified users (previously mainly abroad). Unfortunately, they were connected with central planning in socialist countries and they unreasonably lost a lot of their attractiveness

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³ Actually, there can be found three models in ESA 95, see ESA 95, § 9.01.

there. But even in post-communist countries they are slowly getting back to the centre of interest and this is probably due to the development in education of economics and nowadays computing possibilities. This article also should provide answers to some very frequent questions on the interpretation and explanation of modern input-output tables.

A complete and systematic description of the economy hidden in input-output tables predetermines SIOs for different purposes. For example, original input-output tables for the Czech Socialist Republic (1973 and 1987) were used for the estimates of time series of Czech gross domestic product in period 1970–1989 (Sixta, Fischer, 2012). Similarly, they were also used in the revision of Czech national accounts done by the Czech Statistical Office in 2012, see Historical Yearbook of National Accounts (CZSO 2012).

1 HISTORY OF CZECH INPUT-OUTPUT TABLES

The history of input-output tables goes back to *Tableau Économique* prepared by F. Quesnay, theories of Adam Smith, Karl Marx and other economists but the current approach to input-output models is crucially connected with famous economist W. Leontief. W. Leontief compiled US input-output tables for 1919 and 1929 and his book *Input-output Economics* has become very famous, see Leontief (1986). He was awarded a Nobel Prize in economics in 1973 for the development of input-output method and its applications. Input-output tables were formally joined with national accounts within SNA 1968 framework applied in the West. Practically it was very complicated to compile input-output tables without advanced computers and compilation of input-output tables was done only in the most developed countries. Similarly in the Eastern Block, SIOs were compiled for planning purposes, but they were based on different economic theories. Soviet system of economic statistics was applied in 1950s in socialist countries including Czechoslovakia.

In line with Marx theories, socialist measurement of economy was based on the division of economy into productive and non-productive activities. Productive activities were deeply described by the Material Product System (MPS) within Balances of National Economy (BNE). It means that SIOs compiled in socialist countries were not comparable with the practice in the West.

The first input-output tables were compiled for Czechoslovakia for 1962 (96 products) and before compilation a lot of research work preceded. Since then in a five-year period SIOs were compiled (1967, 1973, 1977, 1982, 1987). The first tables for the Czech Republic⁴ were compiled for 1973 (89 products), subsequently in five-year period (1977, 1982, 1987).

National accounts were introduced in Czechoslovakia with the transformation of the country in 1990. Originally proposed ideas on combination of Balances of National Economy and System of National Accounts (Arvay, 1992) were abandoned. During the preparation for transformation of macroeconomic statistics, Czechoslovakia was divided and the first national accounts were compiled for the Czech Republic for 1992 (they were published in 1995; see Kieslichova, 2012). These national accounts contained both sector accounts and supply and use tables at purchasers' prices. Since the progress on compilation of national accounts was going on, the emphasis was put on the most demanded agenda as improvements in institutional sector accounts, construction of financial accounts and subsequently construction of balances of non-financial assets. Supply and use tables were compiled seldom; they were finished for 1995 and 1997.

Before the entry into the EU in 2004, a major revision of national accounts was done. This revision included time series of both sector accounts and supply and use tables for 1995–2003. Since then supply and use tables have become a standard tool for balancing and deflation in annual national accounts and symmetric input-output tables are compiled every five years. The first approaches to SIO in the Czech Republic are described in Vavrla, Rojíček (2006).

⁴ Official name was the Czech Socialist Republic since 1. 1. 1969.

Currently, national accounts have two parts. The first are sector accounts describing the creation, distribution and redistribution of values and the second part consists of input-output tables describing technical links and the process of production.

In September 2011, input-output tables started to be published in CZ-CPA and CZ-NACE that caused some complications to users.

2 THE ROLE OF INPUT-OUTPUT TABLES

Input-output tables play a key role in the description of production processes in the economy. Both supply and use tables and input-output tables can be used for analytical purposes but SUT are usually used mainly by national accountants while SIOTs are mainly requested by economists. Therefore supply and use tables are currently used mainly for:

- a. Checking of quality of national accounts' aggregates,
- b. Commodity balancing,
- c. Statistical deflation.

Supply table is compiled at basic prices with the transformation into purchasers' prices.⁵ Use table is valued at purchasers' prices but there are several other matrices hidden behind. It means that there exist valuation matrices covering taxes, subsidies and trade and transport margins. Finally, it is possible to construct use table at basic prices. This hierarchical process of compilation is necessary for deflation and construction of symmetric input-output tables. SUTs are published both at current and previous years prices.

Symmetric input-output tables are compiled at basic prices every five years. Technically, they can be compiled annually but the process is demanding and the needs of the users (economists) are different to those of statisticians. The key role of SIOTs is to provide technical coefficients describing the input and structure of the economy.

Currently SIOTs are not compiled directly as it was before 1989 in MPS methodology (FSO, 1984). They are obtained by mathematical transformation from SUTs. They are two main types of tables:

- a. Product-by-product tables,
- b. Industry-by-industry tables.

Product-by-product tables describing the inputs by products for the production of products (intermediate consumption matrix) and final demand for products are usually preferred in the Czech Republic. Moreover, these tables were preferred in Czechoslovakia. Industry-by-industry tables describe output of industries that is used in industries for their output (in intermediate consumption matrix) and for final demand. Current situation of Czech macroeconomic statistics is generally not suitable for input-output tables and even worse for industry-by-industry tables. There are generally two main difficulties when reading Czech SIOTs. Both are connected with the definition of elementary statistical unit within national accounts. Czech national accounts are fully based on institutional units (IU) that are not deeper broken down by kind of activity units (KAU).⁶ At first, it means that when a particular IU is divided between two, the level of output doubles because there were not counted intracompany sales. At second, the production of bigger IU is sometimes very heterogeneous and it causes problems when applying transformation methods. Since there are significant issues that may influence the "purity" of SIOTs, users should take into account these difficulties.

3 CONSTRUCTION OF INPUT-OUTPUT TABLES

During the socialist time, SIOTs were constructed directly. It means that the key part - intermediate consumption was based on surveys. Structures of inputs for all activities were directly surveyed. Currently,

⁵ Since national accounts' revision in 2011, imports are correctly valued at cif prices.

⁶ Even this is requested by ESA 1995, most countries have problems with this definition.

the situation is different. Companies' costs are surveyed every five years and these data are sufficient for compilation of SUTs. Due to the heterogeneity of output, it is not possible to use cost structures for SIOTs. The Czech Statistical Office uses three methods for deriving SIOTs from SUTs,⁷ see Table 1.

Table 1 Overview of the Czech SIOTs

SIOT type	Method	Description
Product-by-product	A	Product technology assumption (Model A); it is assumed that each product is produced in its own specific way, irrespective of the industry where it is produced.
	F	Almon method based on iterative procedures enabling to avoid negatives when applying product technology.
Industry-by-industry	D	Fixed product sales structure assumption, each product has its own specific sales structure, irrespective of the industry where it is produced.

Source: Eurostat (2008), own elaboration

Both methods A and D are based on matrix algebra and method F is an iterative procedure, details and formulas can be found in Eurostat (2008). SIOTs based on these models have been published since 2011. Before 2011, only product-by-product tables by product technology were compiled and published. The structure of input-output table is described in Table 2.

Table 2 Structure of Symmetric Input-Output Table, Product-by-product

Products (CZ-CPA)	Final use Vectors y			Total use at basic prices
	Final consumption expenditures by products	Gross capital formation by products	Export by products (f.o.b prices.)	Total use by products
Intermediate consumption (product x product)				
Net taxes on products				
Intermediate consumption at purchasers' prices	Final consumption expenditures at purchasers' prices	Gross capital formation at purchasers' prices	Export	Total use at purchasers' prices
Gross value added: Compensation of employees Other net taxes on production Consumption of fixed capital Net operating surplus and mixed income Vectors w				
Output at basic prices Vector x				
Import (c.i.f. prices)				
Total resources at basic prices				
Additional information: Employment, capital stocks				

Source: Hronova et al (2009)

Intermediate consumption matrix is labelled as the first quadrant, vector of final use (v) as the second quadrant and value added (w) as the third quadrant. Let's focus on product-by-product table then basic economic equations valid for all products can be written:

⁷ All of the mentioned models are described in Eurostat I-O Manual, see Eurostat (2008).

$$\begin{aligned}
 X_1 &= a_{11}X_1 + a_{12}X_2 + a_{13}X_3 + \dots + a_{1n}X_n + Y_1 \\
 X_2 &= a_{21}X_1 + a_{22}X_2 + a_{23}X_3 + \dots + a_{2n}X_n + Y_2 \\
 &\dots \\
 X_n &= a_{n1}X_1 + a_{n2}X_2 + a_{n3}X_3 + \dots + a_{nn}X_n + Y_n,
 \end{aligned}
 \tag{1}$$

where X_1 to X_n represent output of n products, a_{ij} are usually called technical coefficients, $a_{ij} = x_{ij}/X_j$ and they represent direct impacts on inputs when producing specific products. In matrix forms, following symbols and equation are usually used (details can be found in Leontief, 1986):

$$Ax + y = x. \tag{2}$$

It means that intermediates plus final demand have to be equal to the output.⁸ For many models (see Eurostat Input-output Manual; Eurostat, 2008), following matrices represent the first necessary steps. Simple static input-output model is expressed:

$$x = (I - A)^{-1} y, \tag{3}$$

where:

A – matrix of technical coefficients,

x – vector of output,

y – final use.

Matrix $(I - A)^{-1}$ is called Leontief inverse and the elements of the matrix can be interpreted as measures of indirect impacts of externally induced changes. SIOs can be used for many models starting from simple static models, dynamic models and in recent years they are used within CGE models.⁹ The detailed description of models can be found in Leontief (1986) and EUROSTAT (2008). Input-output models are very popular in developed countries. These models can be used for different purposes. The most simple, static model is often used for modeling of external shocks on the economy, mainly on output, value added, employment and prices.

3.1 How to read modern symmetric input-output table

It is clear that all products supplied in the economy have to be used for intermediate consumption or final use. When dealing with input-output models, it is more suitable to use separate tables for the use of domestic output and imported products. In other words, the effects should be distributed into domestic output and imports.

Due to a long separate development of input-output models and macroeconomic statistics there is a confusing terminology. Originally used term sector representing columns and rows in input-output table is not used. Nowadays sector is connected with the definition of institutional unit (e.g. company) and institutional sector. Rows and columns represent either products (formerly used term commodity) or industries in terms of kind of activity units. Beside that the term primary inputs represent the third quadrant, gross value added connected with labour inputs (compensation of employees), government (taxes and subsidies) and indirectly capital in broader sense (gross operating surplus and mixed income).

When reading the Czech tables (see Tables 3 and 4), it should be noted that the definition of statistical unit may cause high sensitivity of resulting SIOs on changes in supply and use tables. This means that the so-called unbundling process of some companies leads to high figures on diagonal of intermediate consumption matrix; it is due to sub-deliveries between companies, see Jedličková et al (2009) From a brief

⁸ This is simplified for the closed economy. If imports are taken into accounts, intermediates have to include both domestically produced products and imported products, see Eurostat (2008).

⁹ Computable General Equilibrium models cover a large group of models, see Cardenete et al (2012).

look into SIOT it is clear that raw material products (CZ-CPA code B) are mainly imported, 133 CZK billion of total sources of 201.7 CZK billion. This product group contains mainly coal and crude oil and natural gas. Both gas and coal are consumed for electric energy, heat and gas production (CZ-CPA D). Crude oil is consumed in manufacturing industry; refinery is classified within manufacturing (CZ-CPA C). Some tonnes of coals are consumed by households, 2.6 CZK billion.

Table 3 Symmetric Input-Output Table 2005, I+III Quadrant

CZ-CPA section		Products according to the CZ-CPA sections							TOTAL
		A	B	C	D	E	F	G-S	
A	Products of agriculture, forestry, fishing	16.9	0.4	93.8	0.7	0.1	0.3	9.1	121.3
B	Mining and quarrying	0.3	2.8	111.9	62.2	0.4	7.3	0.9	185.9
C	Manufactured products	47.4	10.2	1 523.5	19.2	13.0	147.6	302.5	2 063.4
D	Electricity, gas, steam	1.2	2.8	41.2	85.2	0.8	2.7	48.0	181.8
E	Water supply, sewerage	0.2	0.3	15.1	2.2	18.0	0.9	11.8	48.5
F	Constructions, construction works	1.1	2.6	20.8	2.4	2.4	199.3	97.2	325.9
G-S	Services	18.3	14.0	392.2	28.7	17.5	151.0	1 150.0	1 771.6
P.2	Intermediate consumption (basic pr.)	85.4	33.0	2 198.4	200.6	52.4	509.1	1 619.5	4 698.3
D.21-D.31	Net taxes on products	2.9	0.4	31.4	1.7	1.2	8.5	59.6	105.7
P.2	Intermediate consumption (purch. pr.)	88.2	33.4	2 229.8	202.3	53.6	517.6	1 679.1	4 804.0
D.1	Compensations of employees	33.0	18.1	349.4	17.7	16.9	89.2	774.2	1 298.5
D.29-D.39	Other net taxes on production	-19.6	-1.5	-0.6	-1.1	0.4	0.2	-3.1	-25.2
K.1	Consumption of fixed capital	15.0	6.9	107.3	42.8	9.7	18.5	376.4	576.7
B.2n+B.3n	Net operating surplus, mixed income	40.2	11.1	227.4	30.5	7.4	96.9	544.2	957.7
B.1g	Gross value added (basic prices)	68.6	34.7	683.5	90.0	34.4	204.8	1 691.8	2 807.8
P.1	Output (basic prices)	156.8	68.1	2 913.4	292.3	88.0	722.4	3 370.9	7 611.8
P.7	Import	36.5	133.6	1 547.0	5.5	6.1	4.6	207.5	1 940.7
	Resources	193.3	201.7	4 460.4	297.7	94.0	727.0	3 578.4	9 552.6

Source: Czech Statistical Office (2012)

The table has to be symmetric, it means that the last column equals to the last row, formulas (1) are valid. Total use at basic prices has to be the same as total supplies at basic prices. The valuation differences between basic prices and purchasers' prices lie in net taxes on products that contain mainly value added tax, excise duties on alcohol, tobacco and fuels and subsidies on products covering mainly subsidies on public transport. Beside taxes and subsidies, trade and transport margins represent valuation difference on a product level. In reality, the price of service provided by the transporter and trader is paid in purchasers' value of a good. In input-output model it is assumed that both intermediate and final users buy separately goods and services connected with the purchase. To obtain a consistency of totals (government has to be taken into account), net taxes on products have to be added to intermediate consumption. In

the third quadrant it means that gross value added is valued at basic prices and it can be computed as output at basic prices less intermediate consumption at purchasers' prices.

The third quadrant offers an income approach to gross domestic product and composition of gross value added. Contrary to sector accounts, in product-by-product tables the interpretation of industries is different. It shows the composition of value added for individual products instead of industries. In industry-by-industry tables, interpretation is the same as in sector accounts. Compensation of employees contains wages and social contributions (mainly paid by employers). Other net taxes on products consist of taxes connected with production¹⁰ (road tax, real estate tax, environmental taxes etc.) and subsidies for covering of the loss. Agricultural subsidies are shown in Table 3, column A and row other net taxes on production, -19.6 CZK billion (sign minus means that obtained subsidies exceeded paid taxes). Consumption of fixed capital represents depreciation of fixed capital in national accounts; see Sixta (2007) or Krejčí (2010). Net operating surplus and net mixed income represent the operating profit from production of the product.

Table 4 Symmetric Input-Output Table 2005, I+III Quadrant

Household final consumption expenditure	Final consumption expend. of general government and NPISHs	Gross fixed capital formation	Changes in inventories incl. valuables	Exports (FOB)	Final use, total	Used resources, total
P.3		P.51	P.52 + P.53	P.6		
37.7	0.1	3.8	3.9	26.5	72.1	193.3
2.6	0.0	0.0	-4.9	18.2	15.8	201.7
392.2	36.2	305.3	23.0	1 640.3	2 397.0	4 460.4
97.9	0.0	0.0	-1.2	19.2	115.9	297.7
23.5	1.8	0.0	1.1	19.1	45.5	94.0
2.1	0.1	393.5	-0.3	5.8	401.1	727.0
794.9	650.4	73.0	1.5	287.0	1 806.8	3 578.4
1 351.0	688.7	775.5	23.0	2 016.1	4 854.3	9 552.6
164.7	0.7	29.1	-1.8	9.7	202.5	308.2
1 515.7	689.4	804.6	21.3	2 025.9	5 056.8	9 860.8

Source: Czech Statistical Office (2012)

3.2 Specific issues of Czech SIOTs

Currently, there can be identified some deviations of Czech tables from other countries. Historically, Czech SIOTs are based on national concept. That means that export covers non-residents' purchases in the Czech Republic (mainly tourism) and import contain expenditures of Czech residents abroad. EUROSTAT and some other countries prefer domestic concept. It means that households' consumption covers non-residents purchases and it does not cover residents' purchases abroad.

There are significant issues connected with energy products (CZ-CPA 35). Due to the nature of elementary unit defined in the Czech national accounts, so called unbundling process (Jedličková et al, 2009) would have caused overestimation of output and intermediate consumption. Therefore so-called

¹⁰ It should be emphasised that these items cover only taxes connected with production. It means that income taxes, property taxes etc are treated differently in national accounts (within distribution and redistribution of income).

consolidation adjustment is done and output of energy (both electricity and natural gas) is considered only for the first part (“producer”) of distribution chain. All other units connected with purchasing, selling and distribution are regarded as trades instead of producers. This caused that diagonal figure in intermediate costs matrix of SIOT (consumption of energy for production of energy) significantly decreased. Due to a complicated system of accounting and extend of these issues, this figure cannot be fully presented as technical consumption of energy because it still may contain some transactions that were not fully consolidated. Beside the general problems with energy, there is an important deviation from official statistical classification (CZ-CPA) in CPA 352 (distribution of natural gas). Strictly according to classification, this product should contain the service connected with transport and distribution of gas to users. The gas itself should be classified under the product (062). The situation is complicated because of the data availability and the process of production. It is assumed a model based on one-step process of production. Mainly imported gas (062) is consumed in industry of CZ-CPA 352 for the production of final product 352 that is used by customers in intermediate consumption or final use.

Specific services like installation costs (CPA 33) were introduced to gross fixed capital formation (GFCF). This item covers costs associated with the installation of machinery. It is somehow similar to trade margin but directly recorded in GFCF. The good original thought of statisticians is significantly damaged by the inability to obtain such figures in practice. Actually, output of these services is predominantly given by the units (=companies) that are specialised for these services. If the installation service is a part of producers’ services, then there is no distinction between the product itself and the service provided on both sides (seller and customer).

The revision of the statistical classifications (CZ-NACE and CZ-CPA) brought new challenges for both compilers and users of input-output tables. Especially, the section (E) is newly defined. It separately contains water (36), sewerage (37), waste management (38) and remediation activities (39).

4 COMPARISON WITH HISTORIC SIOT FOR 1973

The first SIOT for the Czech Republic compiled for 1973 was prepared in the dimension of 416 products. These figures were aggregates for publication into the dimension of 89×89 and 28×28 . The key principle was very similar to nowadays practice and SIOT was linked to the core balances of national income. Contrary to balances of national income, some services even regarded as non-productive were counted in SIOTs (communications and public transport), see Sixta, Fischer (2011). Current SIOTs should be fully comparable to core sector accounts. Aggregated version of original SIOT in MPS methodology is presented in Table 5.

The structure of original SIOT is the same as nowadays. The first quadrant covered only material products and some services for production of material sphere. Therefore service like education and health were not recorded. The second quadrant covered final use in similar sense to nowadays definition except social consumption. This column is rather intermediate consumption of government units in national accounts’ methodology. As in the whole system, only material products (goods and some services) were covered and the definition of indicators slightly differed from SNA.¹¹ Transfers with Slovakia substituted export and import from and to Slovakia. This item was recorded net and on the use side. Specific issues were losses and differences mainly connected with losses in inventories. Significant differences can be found in the third quadrant where indicator called other net production covers costs of non-productive services purchased by productive sphere, social costs paid for employees and some other items excluded from intermediate consumption or profit. Therefore the item called profit cannot be interpreted as operating surplus.

¹¹ For example, gross investment is not fully comparable to gross fixed capital formation.

Table 5 S IOT, Czech Socialist Republic 1973, Current Prices, CSK mil.

Industry	Intermediate consumption (IC)				TOTAL (IC)	Personal consumption	Social consumption	Investment + inventories	Export	Transfers with Slovakia	Losses and differences
	Agric.	Industry	Constr.	Services							
Agricul.	20 837	34 629	129	60	55 655	11 673	1 866	2 742	1 575	-1 249	1 553
Industry	17 602	302 596	28 775	23 864	372 838	121 141	24 006	36 826	73 255	4 130	-1 502
Constr.	503	2 706	1 923	2 306	7 437	697	7 455	54 440	918	-70	-101
Services	2 690	39 115	6 414	9 420	57 638	8 963	1 650	1	18 037	0	-214
Total IC	41 631	379 045	37 242	35 650	493 568	142 473	34 977	94 008	93 785	2 811	-263
Depreciation	2 626	14 687	1 241	7 132	25 686						
Wages	20 058	52 079	14 066	23 427	109 630						
Other net production	4 558	30 481	9 343	14 014	58 396						
Profit	-2 013	48 590	7 097	917	54 591						
Sales tax	99	38 469	1	0	38 568						
Gross value added	25 329	184 306	31 747	45 490	286 872						
Output	66 960	563 351	68 989	81 141	780 440						
Import	6 854	67 342	1 787	4 934	80 918						
Resources	73 814	630 694	70 776	86 075	861 358						

Source: Czech Statistical Office

Historical S IOTs were also used for the project aimed at estimates of GDP for 1970–1989, see Sixta, Fischer (2010). S IOTs were used for identification of adjustments and industrial structures. Moreover, it is intended to publish S IOTs both for 1973 and for 1987 in SNA methodology as a subsequent result of this project in 2013.

5 SNA 2008 AND ESA 2010 IMPACT ON INPUT-OUTPUT TABLES

SNA 2008 introduced changes in the system of national accounts and practically all parts of the system are affected. Even very reasonable changes from the economic point of view, practically they are very difficult for compilation. It is most seen in the methodology of national accounts where the development of economic theory is far away from practical possibilities of statistical offices. SNA 2008 (UN, 2010) is going to be transformed into European standard, ESA 2010 that will be applied in 2014. It is a justifiable question whether the changes in methodology (even at least partly forced by the change of society and globalisation) will lead to higher quality of data and to the increase of international comparability. Supply and use tables and symmetric input-output tables will be significantly updated due to following changes:¹²

- a. *Goods for processing* will no longer be recorded as import or export. It means that goods imported to the country for processing (e.g. sewing dresses from fabric) is currently recorded in import and

¹² Originally there were proposed more changes in SNA. Also capital services were intended to be a part of non-market output and therefore S IOTs would have to be adjusted (Sixta, Fischer, 2008).

¹³ This is a difference from business accounting.

intermediate consumption¹³ of the producer (provider of sewing services) and after the processing, final product is exported. When SNA 2008 and ESA 2010 are put into practice, only services relating to processing will be recorded. It means that technical coefficients will be changed because it will be possible to provide a service without any material (intermediate consumption will decrease).

- b. *Merchandising* and different treatment of *re-export* may influence the interpretation of export column. Merchandising means trading abroad when resident unit buys and sells goods. According to SNA 2008 it means that not only trade margin should be recorded but also the purchase and sell of goods. Unfortunately it seems that purchases and sales should be recorded in export only and it may lead to negatives when traders suffered a loss from trading abroad. Re-export means that goods can be exported after it was imported before. It is assumed that units trading with some goods can re-export them. Actually it means that goods can be exported even it is not produced in the exporter's country.
- c. *Capitalisation of expenditures on research and development* will cause changes between intermediate consumption and gross fixed capital formation. Very similar impact can be expected from *capitalisation of military assets*.
- d. There can be identified also other changes in SNA methodology that may at least partly influence SIOs. It can be caused due to the changes in assets boundaries, definition in productive activities, etc.

CONCLUSION

Input-output tables covering both supply and use tables and symmetric input-output tables represent a standard part of national accounts in the Czech Republic. Both sets of tables compiled by the Czech Statistical Office are going to be more and more popular and the demand of their users is rising. Along with the increase with the users' needs on data, users' demand on information is rising as well. Unfortunately, Wassily Leontief's famous theory that forms the core of the modern methods of measurement of economic development is not generally well known and it is at least partly due to issues lectured at universities. This is a pity because there is a high availability of input-output tables for the Czech Republic and these tables are mainly used by foreign users like economic schools and research centres. A long history and tradition of Czech economic statistics offers a unique possibility for studying of the Czech economy in a long perspective.

Even SIOs compiled before 1989 were based on Material System Product, they can provide a lot of information relating to Czech economy. These tables can be used directly for studying material part of the economy or these obsolete SIOs can be transformed into SNA methodology. Tradition of a good statistics in former Czechoslovakia means that data from balances of national income and original SIOs can provide unbiased valuable information applicable for many purposes, as they were used for GDP estimates, see Sixta, Fischer (2012).

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