

### Editorial

## Transport Satellite Accounts: Are there any needs for harmonisation?



Jari Kauppila,  
Joint Transport  
Research Centre (OECD)

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Australian Bureau of Statistics

Dear IIOA member,

Transport statistics often discuss the transport activity in terms of passenger-kilometers travelled or ton-kilometers performed by different modes of transport. While these measures are important and provide a needed picture of the transport activity taking place in the economy, the transport activity has been long underestimated in the economic data. National accounts include transport services rendered to third parties. However, there is a significant amount of transport activity produced own-account within non-transport industries or even by households.

There certainly is a need to better understand the transport sector activity in a broader sense. This need is arising from an increasing number of challenges, such as capacity constraints, congestion and CO<sub>2</sub> emissions just to mention a few. A number of countries have started to demand and develop expanded and improved statistics on both the transport industry and transport activity.

Transport Satellite Accounts (TrSA) have a potential to provide an overarching framework for the development of integrated statistics on transport and help to ensure consistency between data sets, over time and possibly within and between nations.

A TrSA presents an opportunity to draw together transport value and volume data into a single accounting framework. Some of the benefits of compiling a transport satellite account include:

- Enabling estimates of the contribution of total transport activity in the economy, including transport services provided in-house by businesses where transport is not their primary activity;
- Estimating total transportation values would not be affected when businesses switch from own-account to for-hire services or vice versa;
- Allowing estimation of the contribution of transport to GDP and other macroeconomic variables;
- Identifying products and services which are characteristic or connected to transportation (and which industries supply and use these). Links could also potentially be drawn between transport use and the environment (e.g. fuel use and links to carbon emissions);
- Providing data critical to economic modelling such as computable general equilibrium models by presenting detailed transport supply and use of products by sector (e.g. business, government, households) and mode of transport;
- Possibility of linking physical infrastructure data, and
- Providing a range of data that will also ensure improvements to the quality of transport data feeding into the system of national accounts, including the input-output tables.

Hence, transport satellite accounts have potential to help identify the impacts of transport policies (vehicle charges, fuel excise, congestion charges) on industries, on regions, and on different users and consumers. They can also address issues pertaining to productivity, energy use, employment, etc.

To date, transport satellite accounts have been developed only in a small number of countries. The International Transport Forum has undertaken an informal stocktaking of its 52 member countries to determine which have undertaken a TrSA or plan to do so in the immediate future. This stocktaking has been complemented by an international literature review carried out by the Australian Bureau of Statistics and the ITF Secretariat.



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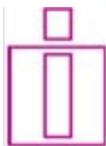
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**Vacancy for a Senior Researcher at the Institute for Prospective Technological Studies (IPTS) in Seville, Spain**

Further information can be found at:  
Institute for Prospective Technological Studies  
Knowledge for Growth Unit,  
[http://ipts irc.ec.europa.eu/ata glance/knowledge\\_for\\_growth.cfm](http://ipts irc.ec.europa.eu/ata glance/knowledge_for_growth.cfm)



In France, TrSA were constructed for 1992, 1996, and 1998 (INSEE, undated). French studies present current spending and capital spending for each mode of transport. They expand the traditional production boundary by taking also into account the social costs of transport (externalities) and furthermore by considering also private purchase and use of cars as part of the accounts (INSEE, 1996). In Belgium, the transport satellite accounts are drawn up at the national level for the years 1995 and 2000 while accounts for 2005 are currently underway.

The construction of accounts follows the same frequency as that of the input-output tables and the methodology used follows, to a large extent, the methodology developed and applied in France (Hoornaert et. al., 2009).

In Italy, the first transport satellite account was done for the benchmark year 1992. It focused on the calculation of the own-account transport similarly to that in the United States. The Italian analysis focused mainly on road transport (Putignano and Montella, 1993)

Preliminary research work has also been done to produce a transportation satellite account, for example in Australia. Within Australia, the ABS and the Bureau of Infrastructure, Transport and Regional Economics (BITRE) have commenced discussions with state government agencies and industry associations to develop a more detailed understanding of the role transport satellite accounts can play in addressing transport information needs.

The findings of the stocktake clearly indicate that there is considerable variation in both the scope and treatment of transport activity in TrSA from country to country. The lack of international agreement on standards for transport accounts means the scope and methodology of measuring transport activity is currently open to statistical agencies to define. The result is the transport satellite accounts prepared are not comparable.

In recent years the UNSC has adopted two satellite accounting systems: the System of Environmental-Economic Accounting for Water (2007) and Tourism Satellite Accounts (2008). The Tourism Satellite Account was jointly developed by the OECD, UN Statistics Division, Eurostat and the World Tourism Organisation (see OECD 2001).

Some of the measurement issues associated with transport are quite complex due to the varied nature of the transport industry

and the distribution of transport activity across the whole economy. Each country has a range of theoretical and practical issues that need to be addressed. These include:

- How best to measure transport activity - from the supply side only or also from the demand side? A demand side measure includes all purchases of transport related goods and services (e.g. motor vehicles, fuel and motor vehicle insurance) by consumers and other end users;



- Should transportation services provided by households for their own use be included in a TrSA? This would expand the production boundary of the national accounts to account for the production of 'unpaid household work' by households;
- Should own account transportation output be valued as the product of a quantity measure of output and the market price for a similar service (including profit margin) or valued on sum of the input costs?
- Should some estimate be made of the physical volume/value of

transportation infrastructure and/or the capital stock of transportation assets in the economy?

- How and what types of employment should be measured in a TrSA? For example, data sources might dictate that employment estimates are only possible for the wider transport industry, or possibly by mode or selected occupations;

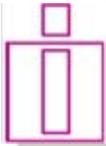
The above issues are just some of the conceptual and methodological issues that need to be considered in compiling a TrSA and at this stage a formal international process for the standardisation of transport satellite accounts has not been established.

Indeed, based on responses to the questionnaire carried out by the International Transport Forum, enough flexibility is still needed to enable TrSA to answer relevant policy questions. However, a number of countries expressed interest to exchange information on current progress and in participating in an informal group to develop more comparable transport satellite accounts.

There is certainly room for informal exchange of best practises and results in order to increase comparability of results between countries and also to possibly save research efforts in solving some of the questions researchers are facing when constructing a transport satellite account. As a part of this request, the International Transport Forum has established an informal e-mailing group to discuss further development of TrSA around the world. The aim is to provide an opportunity to exchange ideas on TrSA and learn how these have been used for policy purposes.

The ITF website provides links and contacts to those institutions that have produced satellite accounts for transport. A dedicated website is available under [www.internationaltransportforum.org/statistics/AddSurveys/TrSA.html](http://www.internationaltransportforum.org/statistics/AddSurveys/TrSA.html)





### Compilation and Use of I-O Tables: The Russian Initiative

Dear IIOA member,

I would like to call attention of I-O-community to the May issue of All-Russian economic journal "EKO" (<http://econom.nsc.ru/eco/>). This journal is published in Novosibirsk on the base of Institute of Economics and Industrial Engineering of Siberian Branch of Russian Academy of Sciences (IEIE SB RAS). It is established by Siberian Branch of RAS and by IEIE SB RAS in 1970. The first editor was Academician Abel Aganbegyan, the current editor is Prof. Valery Kryukov.

Contents of EKO issues are formed by thematic principle. The May issue is devoted to problems of compilation and use of I-O tables. It is not common practice for EKO because this journal is targeted for larger readership than purely scientific community. It covers acute problems of current economic and social life in many aspects not only for professional economists, businessmen and managers, but also for specialists from adjacent and for all interested readers.



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Such format differs EKO from other economic journals. This issue is unique because we tried to explain I-O problems seriously and clearly for a large readership because 2011 is notable year for us—a full-scale census of enterprise accounts this year will enable the compilation of Russian benchmark I-O tables. The last benchmark year was 1995. Over the last 16 years, many changes have taken place in the industrial structure of the economy as well as in the international harmonisation of the classification of products and industries, which should also be adopted in the Russian accounts.

So, our task was to popularise the idea of I-O analysis for those numerous firm-based economists and accountants who will fill in the many forms of the statistical census so they could do it knowingly, responsibly, properly, and carefully. We naturally avoided matrix algebra inasmuch as possible and chose the form of interviews with famous specialists such as Irina Masakova (Rosstat), academician V. Suslov (IEIE SB RAS) and Prof. Albert Steenge (Groningen University). The next issue of EKO includes six papers that tell about I-O. Two additional papers about I-O will be published in the June issue. The authors are mostly participants of International Workshop "Current IO Studies in Post-Soviet Countries" under the IIOA auspice that took place in Moscow in October, 28-29, 2010.

Unfortunately, some part of academic community has a negative opinion toward I-O analysis and propagates such attitude. Hence, our second task was to respond to such criticism.

So, we are pleased to represent our experience of I-O popularization and await for your advice relating to the desired format of the presentation.

The most recent issue of EKO is available at the following address <http://econom.nsc.ru/eco/> 9at the time of this newsletter it is the May 2011 issue). You will note that it is pocket sized. I hope you appreciate the wit of EKO illustrator who conveys the concept of I-O very clearly in comical format. This is EKO style – serious text followed by less-than-serious pictures and illustrations.



EKO n. 5 May 2011

IEIE SB RAS Novosibirsk (Russia)  
<http://econom.nsc.ru/eco/>

### No National Input-Output Tables, Blind Development

Suslov V.I., Novosibirsk [suslov@ieie.nsc.ru](mailto:suslov@ieie.nsc.ru)

### Our Economy Needs Looking at Itself in the Mirror

Masakova I.D., Moscow [masakova\\_id@gks.ru](mailto:masakova_id@gks.ru)

### Input-Output Tables: the Road to Nations' Unity

Melnikova L.V., Novosibirsk [LMelnikova@ieie.nsc.ru](mailto:LMelnikova@ieie.nsc.ru)

### The Input-Output Methodology in the Netherlands

Steenge A., Groningen, Netherlands [a.e.steenge@rug.nl](mailto:a.e.steenge@rug.nl)

### WIOD: the World Input-Output Database

Temurshoev U., Groningen, Netherlands [u.temurshoev@rug.nl](mailto:u.temurshoev@rug.nl)

### Seeming Simplicity of Balance

Ivanov L.A., Astana, Kazakhstan [ivanov52@gmail.com](mailto:ivanov52@gmail.com)

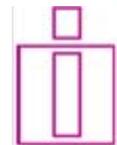


### Input-Output Analysis: Applications in Portugal and Brazil

Lisbon, Portugal, 2 June, 2011

Programme available at:

<http://pascal.iseg.utl.pt/~uece/index.shtml>



### Published Papers in Input-Output Analysis and Related Methods.

#### In the next *ESR* issue

Economic Systems Research -

Journal of the IIOA

Volume 23, Issue 2 (June 2011)

<http://www.tandf.co.uk/journals/titles/09535314.asp>



**PETERS G. CONSTRUCTING AN ENVIRONMENTALLY-EXTENDED MULTI-REGIONAL INPUT-OUTPUT TABLE USING THE GTAP DATABASE**

The use of Multiregional Input-Output Analysis (MRIOA) for understanding global environmental problems is growing rapidly. Renewed interest in MRIOA has led to several large research projects focused on constructing detailed and accurate MRIOTs. However, very few researchers have made use of the already available and regularly updated database produced by the Global Trade Analysis Project (GTAP). We demonstrate and discuss how the GTAP database can be converted into an MRIOT without the need for additional balancing. An illustrative example uses the GTAP-MRIO to reallocate carbon dioxide emissions from producing to consuming countries. We suggest that an MRIOT that treats international transport exogenously is adequate until more reliable data on international transport margins and emissions are available. To focus resources and refine methods, a concerted research effort is needed to compare the results of the GTAP-MRIO model with the new MRIO datasets under development.

**CASLER S. D. COEFFICIENT CHANGE, PRICE EFFECTS, AND IMPLICIT ELASTICITIES: ESTIMATING MICROECONOMIC DETERMINANTS OVER TWO TIME PERIODS**

This paper presents and estimates an input-output model in which input coefficient changes are functions of changing prices. The model produces results that mirror the characteristics of input demand functions based on the model of cost minimization subject to producing a desired level of output. It does not rely on the specification of a functional form for input coefficients, and it does not require the use of assumptions regarding the elasticity of substitution. Instead, it allows the actual price and coefficient changes that occur between periods to identify the implicit elasticities and own- and cross-price derivatives. Using this model, it is shown how accurate measures of price effects, including the full array of own and cross-elasticities of demand, can be estimated for models comprising up to 15 sectors given data for only two time periods.

**WOOD R. CONSTRUCTION, STABILITY AND PREDICTABILITY OF AN INPUT-OUTPUT TIME-SERIES FOR AUSTRALIA**

This paper documents the development of a time series of Australian input-output tables. It describes the construction techniques employed in order to overcome the major issues encountered. Environmentally important processes were delineated using a range of detailed commodity data, thus expanding the original tables from roughly 100 industries into a temporally consistent 344 industries. Data confidentiality and inconsistency were overcome using an iterative constrained optimisation method called KRAS - a recent modification of RAS (Lenzen et al. 2006, 2007, 2009). The article concludes by analysing the stability of input-output coefficients over time similar to work in Dietzenbacher and Hoen (2006). The issue of stability of coefficients and multipliers was investigated under the Leontief and Ghosh models of supply/demand. Finally, the predictability of the models was examined under updated final

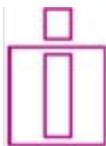
demand or primary inputs and over varying time scales.

**BARKER K. EVALUATING UNCERTAINTY IN RISK-BASED INTERDEPENDENCY MODELING WITH INTERVAL ARITHMETIC**

Several sources of uncertainty exist in the effort to quantify the efficacy of preparedness decision-making in interdependent systems. For the Inoperability Input-Output Model (IIM), a risk-based extension of the traditional Leontief model, which describes the propagation of inoperability throughout interconnected economic sectors, uncertainty is manifested in parameters describing the strength of interdependencies among sectors and in parameters describing the adverse impacts of a disruptive event, among others. As the model is used to evaluate preparedness options to reduce the impact of these disruptive events, such uncertainty can impact decision-making efforts. This paper introduces interval arithmetic as an approach for dealing with uncertainties in the IIM when probability distributions are not known and only variable bounds are available. Illustrative examples highlight the use of the approach as well as a means to improve the evaluation and comparison of risk management strategies in interdependent systems when only intervals are known.

**GÜNLÜK-ŞENESEN G. DECOMPOSITION OF LABOR DEMAND BY EMPLOYER SECTORS AND GENDER: FINDINGS FOR MAJOR EXPORTING SECTORS IN TURKEY**

This paper attempts to provide insight into the likely impacts of the current global crisis on employment in Turkey. As this crisis hits the Turkish economy through a demand squeeze in the international market, our focus is on the labour demand generated by major export sectors. The decomposition of impacts with respect to gender is of particular interest given the significant gender imbalances in the labour market. The findings indicate that female (male) employment is most sensitive to wearing apparel (trade) exports. In general, employment generation potentials of major export sectors are found to be weaker for females and stronger in agriculture, trade and finance, while they are very limited in manufacturing for both genders.



SANCHO F.

#### BOOK REVIEW

Designing Public Policies

*An Approach Based on Multi-Criteria Analysis and Computable General Equilibrium Modeling*

André F. J., Cardenete M. A., Romero C.



LAGER C. OBITUARY ANDRAS BRODY

## Highlights in journals

**SU B., HUANG H.C., ANG B.W. AND ZHOU P.** Input-output analysis of CO<sub>2</sub> emissions embodied in trade: the effects of sector aggregation.  
*Energy Economics* 32 (1), 166-175.

Energy-related CO<sub>2</sub> emissions embodied in international trade have been widely studied by researchers using the input-output analysis framework. These studies are often conducted at a specific level of sector aggregation and the choice made to a large extent is dictated by economic and energy data availability. We investigate analytically the possible effects of sector aggregation on the study results. We conduct empirical studies using the data of China and Singapore where energy-related CO<sub>2</sub> emissions embodied in their exports are estimated at different levels of sector aggregation. A finding from the studies is that levels around 40 sectors appear to be sufficient to capture the overall share of emissions embodied in a country's exports. Another finding is that in approximating the "ideal" situation the hybrid data treatment approach produces better results than the uniformly distributed data treatment approach. Other findings and some recommendations are also presented.

**MESNARD L.** Negatives in symmetric input-output tables: the impossible quest for the Holy Grail  
*Annals of Regional Science*, 46(2), 427-454

In the Supply-Use (or Make-Use) input-output models, "product-technology" (PT) or "fixed-industry-sales-structure" (FISS) assumptions are more widely adopted (SNA, Eurostat) for deriving symmetric input-output tables (SIOT) than "industry-technology" or "fixed-product-sales-structure" assumptions, but generate negatives in the SIOT. An SIOT deduced from the Supply-Use model is considered as satisfactory as soon as it contains no more negatives; scholars have focused on the negatives in the SIOT and on how to remove them. However, as an SIOT may include no negatives even if there are some negatives in the inverse Supply matrix, we have completely reversed the reasoning. A counter-example demonstrates that computing the inverse Supply matrix, as imposed by PT or FISS assumptions, is mathematically a nonsense operation even when the symmetric input-output tables do not include any negative; this result is new. Hence, deriving an SIOT under PT or FISS assumption must be rejected. Three applications are provided: Austria 2000 and 2005 and USA 2007.

**FERREIRA DO AMARAL J., DIAS J. AND LOPES J.C.** A new kind of production and value-added multiplier for assessing the scale and structure effects of demand shocks in input-output frameworks.  
*Annals of Regional Science* ("Early View" on-line only)

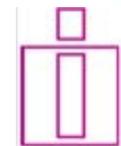
The main purpose of this paper is to develop a new kind of input-output multiplier that would be particularly well suited to quantifying the impacts of final demand changes on the sectoral output or value-added growth potential of an economy. Instead of using the traditional output multipliers, solving an appropriate optimization problem provides what can be called input-output Euclidean distance multipliers. The method does not impose unitary final demand shocks with a fixed (predetermined) sectoral structure, thus allowing the economy to change across the spectrum of all possible final demand variations represented by vectors of modulus 1. It can be very helpful in measuring interindustry linkages and key sectors in a national or regional economy. An empirical illustration is made, using national (Spain and Portugal) and regional (Balearic Islands and the Azores) input-output data.

**OOSTERHAVEN J., ESCOBEDO-CARDEÑOSO F.** A new method to estimate input-output tables by means of structural lags, tested on Spanish regions.  
*Papers in Regional Science* ("Early View" on-line only)

The RAS method extrapolates a single matrix to conform to new row and column totals. This paper proposes a cell-correction of RAS (CRAS) that uses the deviations of multiple RAS projections, to improve the projection of the input-output table (IOT) of a specific country or region. The new method is tested on eleven survey-based IOTs of Spanish regions for 1999-2005. CRAS is shown to outperform RAS when three to four survey IOTs are used that are close to the target IOT. When more IOTs are added, for most but not all regions, CRAS gradually becomes worse than applying RAS to the single best IOT. The article contains some guidelines about how to choose the best regions or countries for the spatial projection at hand.

**SU B., ANG B.W.** Input-output analysis of CO<sub>2</sub> emissions embodied in trade: The effects of spatial aggregation  
*Ecological Economics* 70 (1), 10-18.

Energy-related CO<sub>2</sub> emissions embodied in international trade have been widely studied by researchers using the environmental input-output analysis framework. It is well known that both sector aggregation and spatial aggregation affect the results obtained in such studies. With regard to the latter, past studies are often conducted at the national level irrespective of country or economy size. For a large economy with the needed data, studies may be conducted at different levels of spatial aggregation. We examine this problem analytically by extending the work of Su et al. (2010) on sector aggregation. We present a numerical example using the data of China and by dividing the country into eight regions. It is found that the results are highly dependent on spatial aggregation. Our study shows that for a large country like China it is meaningful to look into the effect of spatial aggregation.



### Upcoming conferences



### 8th EU-REAL Meeting: Economic Development in Peripheral Regions

Alghero, Italy  
21-23 September 2011

The European Union Regional Economics Applications Laboratory (EU-REAL), CRENoS and Department of Economics, University of Sassari, will organize a workshop on all the topics of regional science and urban economics, as well as transport economics. The workshop will be held at the Porto Conte Research Institute in Alghero, Sardinia, Italy. Abstracts should be prepared in PDF-format and should be sent to Maria Gabriela Ladu <mgladu@uniss.it> and Bianca Biagi (<[bbiagi@uniss.it](mailto:bbiagi@uniss.it)>).

Submission of papers: 1 July 2011

Further information at: <http://www.real.illinois.edu/>



### Contemporary Challenges to Monetary Policy

Manila, Philippines  
6-7 December 2011

The Bangko Sentral ng Pilipinas is organizing a conference on "Contemporary Challenges to Monetary Policy" to be held in Manila on December 6-7, 2011. The conference aims to bring together academics and Central Bank researchers to discuss important issues currently impinging on monetary policymaking, such as:

- statistical requirements for monetary policymaking;
- survey-based indicators;
- evaluation of sectoral impacts of monetary policy (to include use of financial computable general equilibrium models);
- monetary and fiscal policy nexus;
- role of central banks in the rebalancing in emerging market economies;
- regional cooperation in monetary and financial policies in Asia;
- risk management in central banking.

Interested contributors may submit a draft paper or a two-page proposal/extended abstract, together with their curriculum vitae to [secretariat.mpss@bsp.gov.ph](mailto:secretariat.mpss@bsp.gov.ph) not later than August 19, 2011. Accommodations and modest honoraria will be provided.

Abstract deadline: 19 August 2011

<http://www.bsp.gov.ph>



4th WIFO – Regional Economics Workshop

### Regional Development and Mobility in the European Union

Vienna, Austria: 13-14 September 2011

The aim of the 4th WIFO – Regional Economics Workshop which will focus on the topic of "Regional Development, Integration and Mobility in the European Union" is to bring together researchers who analyze regional effects of the European Integration processes either from an ex-post or an ex-ante perspective. Special focus will be given to comparative papers and studies focusing on Austria, the EU12 (new member states), candidate countries, as well as other European countries. Papers covering other regions are, however, also welcome.

The Workshop will be held at the Austrian Institute of Economic Research (WIFO) in Vienna.

The cost for hotel accommodation and travel expenses will be covered for up to three authors of accepted papers. There are no workshop-specific fees charged to participants. All presented papers will be published in the WIFO working paper series. Papers should be prepared in PDF format and should be sent to Peter Huber: [huber@wifo.ac.at](mailto:huber@wifo.ac.at)

Submission of papers: 30 June 2011.

Newsletter Editor:

**Ignazio Mongelli**

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