Newsletter

International Input-Output Association (IIOA)

Number 21; February, 2013

Editorial

Special issue on GMRIO frameworks

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TNO

Dear IIOA member,

At the 18th Input-Output Conference in Sydney in 2010, a small group of researchers working on global multiregional input-output (GMRIO) modelling met and discussed future collaboration. After that they met at Réunion Island (March 2011) and Tokyo (January 2012), which was the source of most of the papers that are presented in ESR's latest special issue on GMRIO frameworks.

The special issue brings together examples of the world's most ambitious projects and studies in the field. It is published just after three new major GMRIO databases were finalised: WIOD, EORA and EXIOBASE. For quite some time, databases did exist with harmonized national input-output tables (IOTs) for a large number of countries and for several years. The best known examples are GTAP and OECD. Also some (but few) intercountry IOTs have been constructed some time ago, such as the Asian International IOTs produced by IDE-JETRO since 1975. Yet, true GMRIO databases did not exist and individual researchers have used existing databases with national IOTs and trade data for their studies (including the work by Ahmad and Wyckoff using OECD tables and by Peters and colleagues using GTAP tables). The construction of the new GMRIO databases required an unprecedented integration and harmonization of data from different sources. For the first time in history, the entire global economy is captured in databases of unprecedented detail, with a broad number of environmental and socio-economic extensions, and/or with time series in both current and previous year's prices. This, in turn, makes a type of case study possible that could not be conducted hitherto.

The recent construction of several GMRIO databases was triggered by discussions in two strands of the literature. That is, discussions on appropriately measuring the responsibility for emissions and on the role of international trade of goods and services. Both issues called for the use of GMRIO tables.

The literature on environmental issues has shown an increased interest in the interactions between trade and the environment since the 1970s. A policy relevant discussion centred around the Kyoto protocol, which specifies—for each ratifing country—targets for the reduction in the emission of greenhouse gases (GHG). These national targets, however, are set on a territorial basis and a large part is due to emissions generated by domestic production. That is, it includes the (domestic) emissions embodied in exports and excludes the (foreign) emissions embodied in imports. Given the global character of GHG, this raises questions about the environmental responsibility of a country. This led to the discussion on producer versus consumer responsibility. Under the principle of consumer responsibility, all

In this issue

Emilio Fontela Awards in Input-Output Analysis for Young Researchers

The Hispanic-American Input-Output Society (SHAIO) is pleased to announce the Third Emilio Fontela Award for the best scientific quality conference paper of the forthcoming Fifth Spanish Input-Output Conference.

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global emissions that are attributed to the final use of a country and summed, resulting in the national GHG footprint. The producer responsibility reflects the emissions of a country due to its production. Clearly, the difference between consumer and producer responsibility is intimately related to the difference between exports and imports of embodied emissions. Due to a lack of data, early empirical applications focused on single countries, followed by studies that took a small set of countries into consideration. Only recently, have researchers started to use GMRIO tables.

Similar issues have arisen in the trade literature. Shares of production processes have increasingly become sliced up (or fragmented) into ever smaller parts across counties. That is, the supplies of parts are increasing outsourced to specialized subcontractors, which are becoming ever more located in foreign countries (i.e. offshoring). This has led to an uptick in the trade of intermediate products, which, more often than not, is produced in a different country than is the final product.

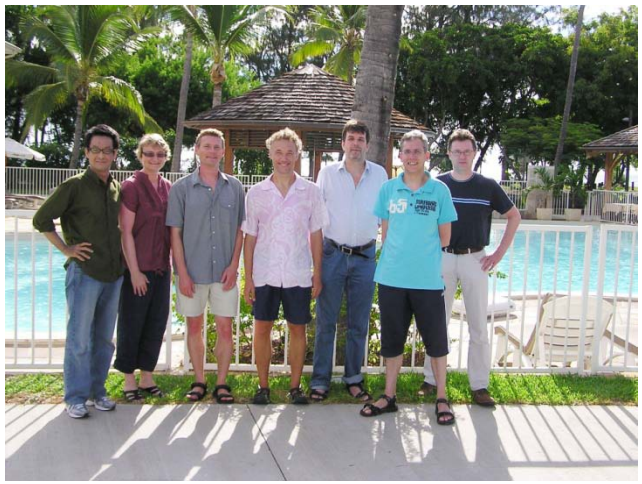

Photo: Réunion Island, March 28, 2011.
From left to right: Satoshi Inomata, Terrie Walmsley, Thomas Wiedmann, Manfred Lenzen, Arnold Tukker, Erik Dietzenbacher, Bart Los.

In essence, today's products and services are rarely produced within a single country. Instead, they are made via global supply chains, or global value chains. That is, countries import intermediate goods and raw materials, to which they add one or more layers of value after which they sell a product (often to a foreign producer who adds the next layer). Standard trade figures do not well reveal the set of relevant detail to uncover such transactions. Instead, the built-in components of traded products are typically counted twice (or more) in national accounts. Recently, IDE-JETRO and the WTO jointly proposed "trade in value added" as a better approach for measuring international trade.

It is obvious that the ideal 'Mother of all GMRIO databases' must be as detailed as possible in terms of sectors and products, with a set of socio-economic and environmental extensions as extensive as possible, covering the globe and discerning as many as possible countries and regions, including long time series, and is cost-effective to build. Unfortunately such an ideal database does not exist and is likely to never be constructed: It would take too much time and funding to enable. Still, several GMRIO databases do presently exist, and each has its own advantages and disadvantages toward meeting such desired ends, based on choices that their developers made.

After a brief introduction, the special issue starts with discussions of the three new database projects (i.e. EORA, EXIOPOL, and WIOD). These are followed by presentations of work using pre-existing GMRIO databases (i.e., one using GTAP data and the other using the Asian International IOTs by IDE-JETRO). The last paper focuses on the policy relevance of GMRIO tables.

Manfred Lenzen, Daniel Moran, Keiichiro Kanemoto and Arne Geschke discuss the construction of the EORA database with GMRIO tables at high country and sector resolution. That is, changes to the structure of the original raw data were avoided as much as possible for the sake of transparency. The EORA tables currently exist as a time series spanning the period 1990-2010, distinguishing 187 countries represented at a detail of 20-500 sectors.

Arnold Tukker and colleagues describe the construction of the EXIOPOL database (in short: EXIOBASE) and provide an illustrative case study. The EXIOPOL project chose to use SUTs (with 129 products and sectors) as a basis. The EXIOBASE covers the 27 EU member states next to 16 non EU countries with a rest of the world. Its main aim was to provide environmentally relevant information and, hence, had as ambition to have detail in sectors such as agriculture, energy, mining and transport, where impact intensities can differ quite a lot.

Erik Dietzenbacher, Bat Los, Robert Stehrer, Marcel Timmer and Gaaitzen de Vries discuss the compilation of the World Input Output Tables (WIOTs) from the WIOD project. This database covers the 27 EU countries, 13 major other economies and a rest of world, provides annual data for the period 1995 to 2009, and distinguishes 35 industries and 59 products. Characteristics of WIOD are (1) full benchmarking on National Accounts Statistics; (2) an improved allocation for trade in goods; (3) detailed socio-economic and environmental satellite accounts; and (4) tables in current prices and in previous year's prices.

Robbie Andrew and Glen Peters describe how they transformed GTAP's database into a true multiregional IOT. First, they discuss how GTAP constructs a harmonized database of IOTs (domestic and import) for 109 individual countries and 20 regions making up the world covering 57 sectors, balanced and harmonized bilateral trade data, macro-economic data, transport data, and protection data. They then tell how they converted the harmonized GTAP database into a GTAP-MRIOT by distributing the contents of the imports IOTs across bilateral exporting countries using GTAP trade data.

Bo Meng, Yaxiong Zhang and Satoshi Inomata discuss in their paper the compilation and application of IDE-JETRO's international IOTs, such as the Asian International IOTs (AIIOT) and the Transnational Interregional IOT between China and Japan (TIIOT). The AIIOTs cover an important part of the global economy back to the mid-1970s. They were compiled with close support from official governmental institutes. IDE-JETRO carried out an in-depth cross-country survey to understand the differences in statistical treatment and presentation format of individual IOTs.

Thomas Wiedmann and John Barrett describe the extent to which analyses based on environmentally extended (EE) MRIO databases have contributed to policy decision-making and policy formulation. The authors concentrate on policy relevance and review various examples such as the WWF (World Wide Fund for Nature) using EE MRIO to analyze the global GHG emissions. They provide evidence that such work is picked up in policy debates and by some policy makers.

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Tales from the I-O world

New project: Industrial Ecology Virtual Laboratory

Dear readers,

A team of ten collaborating Australian institutions have begun work on a new project establishing ground-breaking electronic infrastructure for environmental and economic modeling. The "Industrial Ecology Virtual Laboratory" will enable the rapid and cost-effective deployment of harmonized, large-scale, detailed Multi-Region Input-Output (MRIO) analysis systems. Such systems are sought after in Economics, Environmental Science, and Industrial Ecology for their ability to comprehensively trace environmental impacts across complex interregional supply chains. MRIO analysis has emerged as the major tool underpinning consumption-based accounting of environmental impacts.

The Industrial Ecology Lab will significantly enhance Australia's analytical capabilities in Life-Cycle Assessment (LCA), carbon footprinting, water footprinting, and other approaches to environmental impact assessment. It will also improve the capacity for modeling future effects of changes in economic and environmental policy. Using novel methods for advanced computation and automation the Industrial Ecology Lab will integrate a diverse set of data streams with a calculation engine that can rapidly react as new information becomes available. This helps to integrate and harmonize data and methods for sustainability accounting, analysis and assessments, marking a new era in sustainability research. It will improve the quality and reliability of information provided for applications such as eco-labelling of products, corporate reporting, supply-chain analysis, policy formation, and infrastructure selection.

UNSW THE UNIVERSITY OF NEW SOUTH WALES

A **researcher is required** to manage and work on a number of research projects and deliver according to existing contracts in the areas of sustainability and hybrid life cycle assessment (LCA). The purpose of this position is to advance IO-based hybrid LCA methodologies and their application in government and industry sectors, and to incorporate sustainability thinking and sustainability tools into higher-level decision-making and policy frameworks. The position is initially limited to one year.
The appointee at this level is expected to manage and work on the current projects of the Sustainability Assessment Program including the new Industrial Ecology Virtual Laboratory and provide strategic direction. The researcher will work independently and ensure on time delivery of project tasks and reporting and other deliverables of research and applied research projects.

An appointee at this level will usually have strong tertiary qualifications in environmental engineering or a related field. The candidate should have a sound technical ability and experience working with quantitative data as evidenced by their prior academic publications and/or technical reports. Programming skills are essential. The candidate would ideally have some years of experience in the development or application of environmentally extended input-output analysis or other quantitative sustainability assessment methods. Experience in hybrid LCA would be highly regarded. The candidate should have excellent written and oral communication skills, an ability to manage new and existing research projects, and possess or show willingness to develop good working relationships with researchers in the relevant field.
Details of the position have been posted here: https://www.hr.unsw.edu.au/services/recruitment/jobs/15031304.html. For further information please contact Tommy Wiedmann, via email t.wiedmann@unsw.edu.au.

Funding for the virtual laboratory was awarded by the Australian Government's NeCTAR scheme and the project is supported by the Australian Bureau of Statistics. Hosting the Industrial Ecology Lab on a NeCTAR Research Cloud will make it accessible to Australia's research and policy development community.

For further information on the project please contact me by e-mail t.wiedmann@unsw.edu.au.

Tommy Wiedmann

Grantholder position available at the JRC-IPTS

European Commission

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Published papers in Input-Output Analysis and related methods.

In the next ESR issue

Economic Systems Research –

Journal of the IIOA

Volume 24, Issue 2 (June 2012)

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

GLOBAL MULTIREGIONAL INPUT-OUTPUT FRAMEWORKS; AN INTRODUCTION AND OUTLOOK. TUKKER A. AND DIETZENBACHER E.

This editorial is the introduction to a special issue of Economic Systems Research on the topic of Global Multiregional Input Output (GMRIO) tables, models, and analysis. It provides a short historical context of GMRIO development and its applications (many of which deal with environmental extensions) and presents the rationale for the major database projects presented in this special issue. Then the six papers are briefly introduced. This is followed by a concluding comparison of the characteristics of the main GMRIO databases developed thus far and an outlook of potential further developments.

BUILDING EORA: A GLOBAL MULTI-REGION INPUT-OUTPUT DATABASE AT HIGH COUNTRY AND SECTOR RESOLUTION. LENZEN M., MORAN D., KANEMOTO K., AND GESCHKE A.

There are a number of initiatives aimed at compiling large-scale global Multi-Region Input-Output (MRIO) tables complemented with non-monetary information such as on resource flows and environmental burdens. Depending on purpose or application, MRIO construction and usage has been hampered by a lack of geographical and sectoral detail; at the time of writing the most advanced initiatives opt for a breakdown into at most 129 regions and 120 sectors. Not all existing global MRIO frameworks feature continuous time series, margins and tax sheets, and information on reliability and uncertainty. Despite these potential limitations, constructing a large MRIO requires significant manual labour and many years of time. This paper describes the results from a project aimed at creating an MRIO account that: represents all countries at a detailed sectoral level, allows continuous updating provides information on data reliability, contains table sheets expressed in basic prices as well as all margins and taxes, and contains a historical time series. We achieve these goals through a high level of procedural standardisation, automation, and data organisation.

EXIOPOL – DEVELOPMENT AND ILLUSTRATIVE ANALYSES OF A DETAILED GLOBAL MR EE SUT/IOT. TUKKER A., DE KONING A., WOOD R., HAWKINS T., LUTTER S., ACOSTA J., RUEDA CANTUCHE J.M., BOUWMEESTER M., OOSTERHAVEN J., DROSDOWSKI T. AND KUENEN J.

EXIOPOL (A New Environmental Accounting Framework Using Externality Data and Input-Output Tools for Policy Analysis) was an EU funded project creating a detailed, global, multiregional environmentally extended supply and use table (MR EE SUT) of 43 countries, 129 sectors, 80 resources, and 40 emissions. We sourced primary SUT and IOT from Eurostat and non-EU statistical offices. We harmonized and detailed them using auxiliary national accounts data and co-efficient matrices. Imports were allocated to countries of exports using UN COMTRADE trade shares. Optimization procedures removed imbalances in these detailing and trade linking steps. Environmental extensions were added from various sources. We calculated the EU footprint of final consumption with resulting MR EE SUT. EU policies focus mainly on energy and carbon footprints. We show that the EU land, water and material footprint abroad is much more relevant, and should be prioritized in the EU's environmental product and trade policies.

THE CONSTRUCTION OF WORLD INPUT-OUTPUT TABLES IN THE WIOD PROJECT. DIETZENBACHER E., LOS B., STEHRER R., TIMMER M. AND GAAITZEN DE VRIES.

This article describes the construction of the World Input-Output Tables (WIOTs) that constitute the core of the World Input-Output Database (WIOD). WIOTs are available for the period 1995-2009 and give the values of transactions among 35 industries in 40 countries plus the "Rest of the World" and from these industries to households, governments and users of capital goods in the same set of countries. The article describes how information from National Accounts, Supply and Use Tables and International Trade Statistics have been harmonized, reconciled and used for estimation procedures to arrive at a consistent time series of WIOTs.

A MULTI-REGION INPUT-OUTPUT TABLE BASED ON THE GLOBAL TRADE ANALYSIS PROJECT DATABASE (GTAP-MRIO). ANDREW R. AND PETERS G.P.

Understanding the drivers of many environmental problems requires enumerating the global supply chain. Multi-Regional Input-Output Analysis (MRIOA) is a well-established technique for this purpose, but constructing an MRIO Table (MRIOT) can be a formidable challenge. We constructed a large MRIOT using the Global Trade Analysis Project (GTAP) database of harmonized economic, IO, and trade data. We discuss the historical development of the GTAP-MRIO and describe its efficient construction. We provide updated carbon footprint estimates and analyse several issues relevant for MRIO construction and applications. We demonstrate that differences in environmental satellite accounts may be more important than differences in MRIOTs when calculating national carbon footprints. The GTAP-MRIO is a robust global MRIOT and, given its easy availability and implementation, it should allow the widespread application of global MRIOA by a variety of users.

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COMPILATION AND APPLICATIONS OF IDE-JETRO'S INTERNATIONAL INPUT-OUTPUT TABLES. MENG B., ZHANG Y. AND INOMATA S.

International input-output tables are among the most useful tools for economic analysis. Since these tables provide detailed information about international production networks, they have recently attracted considerable attention in research on spatial economics, global value chains, and issues relating to trade in value-added. The Institute of Developing Economies at the Japan External Trade Organization (IDE-JETRO) has more than 40 years of experience in the construction and analysis of international input-output tables. This paper explains the development of IDE-JETRO's multi-regional input-output projects including the construction of the Asian International Input-Output table and the Transnational Interregional Input-Output table between China and Japan. To help users understand the features of the tables, this paper also gives examples of their application.

POLICY-RELEVANT APPLICATIONS OF ENVIRONMENTALLY EXTENDED MRIO DATABASES – EXPERIENCES FROM THE UNITED KINGDOM. WIEDMANN T. AND BARRETT J.

The impressive development in global multi-region input-output databases is accompanied by an increase in applications published in the scientific literature. However, it is not obvious whether the insights gained from these studies have indeed been used in political decision-making. We ask whether and to what extent there is policy uptake of results from environmentally extended multi-region input-output (EE-MRIO) models and how it may be improved. We identify unique characteristics of such models not inherent to other approaches. We then present evidence from the United Kingdom showing that a policy process around consumption-based accounting for greenhouse gas emissions and resource use has evolved that is based on results from EE-MRIO modelling. This suggests that specific, policy-relevant information that would be impossible to obtain otherwise can be generated with the help of EE-MRIO models. Our analysis is limited to environmental applications of global MRIO models and to government policies in the UK.

Highlights in journals

WATSON P.S., CASTELIN K., SALANT P., WULFHORST J.D.. (2012) ESTIMATING THE IMPACTS OF A REDUCTION IN THE FOREIGN-BORN LABOR SUPPLY ON A STATE ECONOMY: A NESTED CGE ANALYSIS OF THE IDAHO ECONOMY. THE REVIEW OF REGIONAL STUDIES, 42(1), pp. 24-50.

This analysis examines the effects of reducing the supply of foreign-born labor on the Idaho economy. Estimates of labor usage by industry sector are obtained from governmental and non-governmental data sources and are incorporated into a 14-sector nested computable general equilibrium (CGE) model with five primary factors of production consisting of capital and four different labor groups (foreign-born less -educated, native-born less-educated, foreign-born more-educated, and native-born more-educated). The results of the model indicate that at the expected elasticities of substitution between similarly educated native-born and foreign-born labor, the reduction of the foreign-born less-educated labor supply modestly increases the demand for native-born less educated labor while causing reductions in state GDP, total economic output, and household utility. The importance of the elasticities of substitution between the various labor groups in influencing the impact results is discussed and a sensitivity analysis performed. The CGE results are then compared to those of an input-output model: the differences are discussed.

LENZEN M., RUEDA-CANTUCHE J.M. (2012) A NOTE ON THE USE OF SUPPLY-USE TABLES IN IMPACT ANALYSES. SORT 36 (2) PP. 139-152

Little attention has so far been paid to the problems inherent in interpreting the meaning of results from standard impact analyses using symmetric input-output tables. Impacts as well as drivers of these impacts must be either of the product type or of the industry type. Interestingly, since supply-use tables distinguish products and industries, they can cope with product impacts driven by changes in industries, and vice versa. This paper contributes in two ways. Firstly, the demanddriven Leontief quantity model, both for industry-by-industry as well as for product-by-product tables, is formalised on the basis of supply-use tables, thus leading to impact multipliers, both for industries and products. Secondly, we demonstrate how the supply-use formulation can improve the the incorporation of disparate satellite data into input-output models, by offering both industry and product representation. Supply-use blocks can accept any mix of industry and product satellite data, as long as these are not overlapping.

CORDIER, M., PÉREZ AGÚNDEZ, J. A., O'CONNOR, M., ROCHETTE, S., HECQ, W., 2011. QUANTIFICATION OF INTERDEPENDENCIES BETWEEN ECONOMIC SYSTEMS AND ECOSYSTEM SERVICES: AN INPUT-OUTPUT MODEL APPLIED TO THE SEINE ESTUARY. ECOLOGICAL ECONOMICS, 70(9), PP. 1660-1671.

The aim of this paper is to assess the possible contribution of an input-output model towards two of the basic principles of the sustainability strategy of integrated coastal zone management (ICZM) and Post-Normal Science. According to these principles, decision-support tools should offer a holistic perspective and handle high uncertainty. The difficulties in reaching sustainability are due partly to the prevailing use of "narrow-system-boundary" tools that are non-holistic. Consequently, they fail to capture important ecosystem services and ignore interdependencies between them. To comply with the basic principles, our method allows environmental assets to be evaluated in multiple units and integrates results from recent researches in natural sciences. Both enable coverage of interdependencies between ecosystem services. Thereby, we enlarge input-output modelling from the two conventional ecosystem services of sink and provisioning to the most vital ones: the supporting services. An application to the Seine estuary addresses the impacts of maritime transportation infrastructures on nursery habitats for commercial fish. The ecosystem services covered are life support and resource provisioning. Our results show that the restoration of a total of 73.7km2 of nursery areas over the period 2004-2015 would result in a stock of sole in 2015 that exceeds the "business as usual" scenario by 44.2% (uncertainty range: 35.9% – 69.9%). In spite of high restoration costs, the negative macro-economic impact is very low. However, on the sector level, a trade-off results between nurseries and three economic sectors. The quantification of such trade-offs in our model is particularly useful to public participation in decision-making.

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CADARSO M.A.., GÓMEZ N., LÓPEZ L.A. AND TOBARRA M.A. (2012) INTERNATIONAL TRADE AND SHARED ENVIRONMENTAL RESPONSIBILITY BY SECTOR. AN APPLICATION TO THE SPANISH ECONOMY. ECOLOGICAL ECONOMICS, 83, PP. 221-235.

The aim of this paper is to define a shared responsibility criterion for analysing the impact of international trade on CO2 emissions applied to sectors. With the approach proposed it is possible for sectors in a country to account for only a part of the emissions associated with exported and imported goods. The agents considered as responsible for pollution are sectors two-fold: as producers and suppliers of intermediate inputs and final demand (accounting for direct emissions linked to production), and as consumers of intermediate inputs required for production (accounting for direct and indirect emissions linked to consumption of inputs), and the countries and foreign sectors that trade with these industries. The responsibility of emissions is shared by all the participants along the global product chain depending on the value added of each step. The criterion is applied to the Spanish economy for the period 2000 to 2005, and proves useful for determining what economic policies may be suitable for mitigating anthropogenic impact on the environment and for including all the agents of the supply chain in the development of sustainable supply chain management.

ZAFRILLA J.E., LÓPEZ L.A., CADARSO M.A. AND DEJUÁN O. (2012) FULFILLING KYOTO PROTOCOL IN SPAIN: A MATTER OR ECONOMIC CRISIS OR ENVIRONMENTAL POLICIES? ENERGY POLICY, 51, PP. 708-719

In 2008, Spain exceeded by 20.9% the CO2 emissions allowed by the Kyoto Protocol for 2012. The financial and economic crisis has transformed these figures: as production fell so did energy demand and with it CO2 emissions. Will the Spanish economic crisis allow Spain to fulfill its commitments? With this in mind, we have developed an extended input-output model able to forecast energy demand and compute CO2 emissions linked to the consumption of energy goods: petroleum products, gas and coal. The results show that the crisis, and in particularly, the stagnation of the construction industry, is only one of the pillars which help to contain these emissions at -6.81%. The possibility of incorporating environmental policies, new technologies and increases in the price of crude oil in these simulations, means an even greater reduction of emissions than the impact of the crisis (-9.76%). The final result of our most pessimistic/realistic scenario is that, in 2012, Spain will exceed its CO2 emissions, linked to the combustion of energy goods, by only 0.9%.

CADARSO M. A., GÓMEZ N., LÓPEZ L.A. AND TOBARRA M. A. (2012) OFFSHORING COMPONENTS AND THEIR EFFECT ON EMPLOYMENT: FIRMS DECIDING HOW AND WHERE. APPLIED ECONOMICS, VOLUME 44(8), PP. 1009-1020.

Firms must take two fundamental decisions: how and where to produce. Traditional measures of offshoring include information on both decisions but cannot distinguish between them. In this article, we attempt to distinguish the evolution of the requirement of inputs per unit of output (how to produce) from the delocalization of production to others countries (where to produce) by using input-output techniques. We call global technical change to the first element and net offshoring to the second. We further decompose net offshoring into net inter-industry substitution and intra-industrial offshoring (replacement of domestic inputs for imported ones from the same sector). This last measure quantifies better the concept of delocalization of production to other countries looking for lower costs, the original idea behind offshoring. This decomposition allows us to further investigate on whether technical change or net offshoring is the main factor in recent Spanish industrial employment changes.

SANCHO F. (2012) STRAIGHTENING OUT THE CONCEPT OF DIRECT AND INDIRECT INPUT REQUIREMENTS. ECONOMICS BULLETIN 32(1), PP. 502-509.

The literature has proposed generalizations and reinterpretations of the Hawkins-Simon condition for macroeconomic stability to off-diagonal matrix elements. These extensions are conceptually relevant for they offer a complementary view of interindustry linkages beyond final or net output influence. The standing extension, however, can be seen to be constructed using the wrong output normalization order. We provide a new and elementary proof for the correct statement that is based upon standard interindustry concepts. Our approach unravels and clarifies the step by step actual mechanisms behind the accounting rules.

PETERS G.P., DAVIS S.J. AND ANDREW R. (2012) A SYNTHESIS OF CARBON IN INTERNATIONAL TRADE. BIOGEOSCIENCES, 9(8), PP. 3247-3276.

In a globalised world, the transfer of carbon between regions, either physically or embodied in production, represents a substantial fraction of global carbon emissions. The resulting emission transfers are important for balancing regional carbon budgets and for understanding the drivers of emissions. In this paper we synthesise current understanding in two parts: (1) CO2 emissions embodied in goods and services that are produced in one country but consumed in others, and (2) carbon physically present in fossil fuels, petroleum-derived products, harvested wood products, crops, and livestock products. We describe the key differences between studies and provide a consistent set of estimates using the same definitions, modelling framework, and consistent data. We find the largest trade flows of carbon in international trade in 2004 were fossil fuels (2673 MtC, 37 % of global emissions), CO2 embodied in traded goods and services (1661 MtC, 22 % of global emissions), crops (522 MtC, 31 % of total harvested crop carbon), petroleum-based products (183 MtC, 50 % of their total production), harvested wood products (149 MtC, 40 % of total roundwood extraction), and livestock products (28 MtC, 22 % of total livestock carbon). We find that for embodied CO2 emissions, estimates from independent studies are robust, and that differences between individual studies are not a reflection of the uncertainty in consumption-based estimates, but rather these differences result from the use of different production-based emissions input data and different definitions for allocating emissions to international trade. After adjusting for these issues, results across independent studies converge to give less uncertainty than previously assumed. For physical carbon flows there are relatively few studies to be synthesised, but differences between existing studies are due to the method of allocating to international trade, with some studies using "apparent consumption" as opposed to "final consumption". While results across studies are sufficiently robust to be used in further applications, more research is needed to understand differences and to harmonise definitions for particular applications.

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Book review

The book titled "Dynamics of Underdevelopment of Uttar Pradesh" edited by Dr. Shri Prakash and Dr. Harivansh Chaturvedi and published by Bloomsbury focuses on relative under development of the economy of Uttar Pradesh in a comparative framework. The development state of U.P is compared with the development of Indian Economy on the one hand and the development of five most developed states of the Indian Union on the other. A comprehensive view of development and underdevelopment is taken in the analysis of several aspects of development which range from social structure, measured in terms of castes and religions, education, infrastructure, poverty, employment, foreign investment, agriculture and industry. A note worthy and prominent aspect of the book is that it traces the concept of region and regional inequalities in historical, geographical and economic perspectives. This book shall be of interest to planners and policy makers, development economists, regional analysts, researchers and students.

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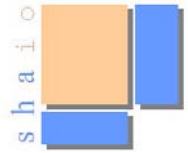

V Spanish Conference in Input-Output Analysis

19-20 September Seville, Spain

It is a pleasure to announce the 5th Spanish Conference on Input-Output Analysis to be hosted by the University of Seville on the 19th and 20th of September 2013, under the auspices of the Hispanic-American Input-Output Society (SHAIO) and the Department of Applied Economics III of the same University. For the first time, two training sessions will be organized next to the conference during the afternoon of September 18th, 2013. They will be about Applied General Equilibrium Models and the Construction of Supply and Use Tables.

April 15th, abstract deadline

May 31st, author notification

June 30th, final paper submission

Further info at:
http://www.shaio.es/index_en.htm#meetingshaio

Newsletter Editor:
Ignazio Mongelli