



# Newsletter

## International Input-Output Association (IIOA)

Number 27; Aug, 2014

### In this issue

**In memoriam** **p. 1**

- [Debesh C. Chakraborty](#)

**Published papers and books in I-O analysis and related methods**

- [Highlights in books](#) **p. 2**
- [Latest ESR articles](#) **p. 3**
- [Highlights in journals](#) **p. 5**

**A look into the past** **p. 8**

**IIOA 2014 Wall of Fame** **p. 10**

**Upcoming events** **p. 11**

### In memoriam

#### Debesh C. Chakraborty (1943-2014)

Former Professor of Economics at Jadavpur University, Kolkata, India, Dr. Debesh Chandra Chakraborty passed away after a short struggle with lung cancer on May 22<sup>nd</sup>, 2014 at a hospital in Kolkata. The University paid homage on the same day to the dedicated teacher and hard-working researcher whose aim was to move institutional excellence forward. His funeral took place in Kolkata later the same day. A vigil of condolence was held at the Department of Economics, Jadavpur University on 26<sup>th</sup> May, 2014.

Dr. Chakraborty was born on June 20<sup>th</sup>, 1943 to Mr. Srish Chandra Chakraborty and Smt. Nagendra Bala Devi in Barisal district in undivided Bengal (now in Bangladesh). He moved to India with his parents and other family members in 1950.

He graduated with honours in Economics and Political Science from Presidency College, Kolkata. For his Master's Degree he joined Jadavpur University where he also completed his Ph.D under the guidance of Professor Ambika Prasad Ghosh. His postdoctoral research at the New York University during 1977-79 with Nobel Laureate Professor W.W. Leontief and his cohort research group brought him closer to the frontier areas of research in Applied Economics and the Input-Output Framework. He consistently attempted to forge and strengthen a collaborative research culture and always was excited to learn new developments in the subject. Moreover, Prof. Chakraborty had a very explorative multidisciplinary approach to his research and took a deep interest in interdisciplinary discourse within Jadavpur University.

Professor Chakraborty joined Jadavpur University as a Lecturer in Economics in the year 1971. Thereafter he



served the university in various capacities such as Dean of the Faculty of Arts, Member of the Executive Council and of the Court of the University, besides being Head of the Department and Coordinator of the Centre for Regional Studies.

He retired from the permanent teaching position when he attained 60 years of age and did not take up re-employment for five more years, driven by his ideology of making room for the younger generation. Still, Professor Chakraborty continued research pursuits until his dying day. He continued to engage himself in joint research activities and in guiding students. He widely travelled with academic assignments within and outside the country.



water @leeds

Closing date:  
20<sup>th</sup> August  
2014

Open position for an Associate Professor in Ecological Economics

# Newsletter

## International Input-Output Association (IIOA)

Number 27; Aug, 2014



He supervised Ph.D theses of 23 students and authored books and published 116 research articles in peer reviewed journals. Although he never saw the final printed version of his last work *Water Pollution and Abatement Policy in India-A Study from an Economic Perspective*, he was able to correct the final proofs for Springer.

His research students wrote:

*He was in true sense a research guide as his goal was to bring out the potential within students and help them grow as an independent researcher through inspiration and by introducing them to appropriate academic networks and emerging areas of research with special focus on Application of the Input-Output Framework and Applied Quantitative Techniques in Economics. He always motivated students to go that extra mile!*

In his personal life he followed Marxian philosophy and sided with the communist party. He served as Vice-Chairman of Baruipur Municipality. But he effortlessly kept his active political affiliation separate from his interaction with friends, neighbours, students, and fellow researchers who had various political allegiances. He, in fact, encouraged plurality in social space and maintained a simple style of living.

He is survived by his family members: brothers, sisters and by scores of admirers; and, last but not the least, by his large number of students who now carry forward his tradition of dedicated research.

*May his spirit soul rest in peace!*

*Students and colleagues*

### Memories

In 1977 Debesh came to the Institute for Economic Analysis at New York University for a two years' visit. His main task was to help collecting and organizing data for the nonfuel minerals project. The United States suffered from an oil boycott by the Arab countries, and we had to find out if there were similar dependencies on other minerals. Debesh was a promoter of intellectual discourse. He organized a reading club, consisting of Vu Viet, Tony Small, himself and me. We studied and discussed the work of the Hungarian economist Andras Bródy. Debesh asked people what they found interesting problems and would collect the relevant literature. Our first joint paper was a review of the aggregation problem in input-output analysis. Another was related to the steel industry; it produced different products and we had to construct the respective input coefficients. I noticed that the method we used was not invariant with respect to the units of measurement and Debesh, Tony and I developed an alternative, which we published in the *Review of Economics and Statistics*. Less prominent, but intellectually more rewarding, was a joint paper with Tuhin Das on working capital: inputs in the pipeline of production. Debesh was always organizing teams. The first time I visited his Jadavpur department was in 1982, and I still have vivid memories. Then and later I met his students, Anushree Sinha, Joyashree Roy, Kakali Mukhopadhyay, Chandrima Sikdar, and others, which in turn led to a flurry of research and teaching activities.

We all lose a stimulating colleague.

*Thijs ten Raa*

Tilburg University (Netherlands)

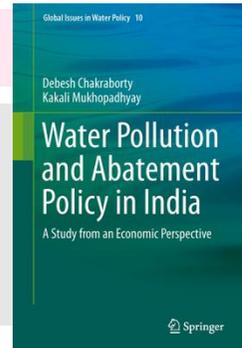


**Published papers and books in IOA and related methods**

### Highlights in Books

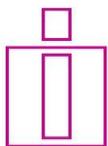
**WATER POLLUTION AND ABATEMENT POLICY IN INDIA: A STUDY FROM AN ECONOMIC PERSPECTIVE.**

Chakraborty D.C. and Mukhopadhyay K. Springer, 2014



India has been traditionally well-endowed with large freshwater reserves, but increasing population, urbanization and agricultural growth in recent decades are causing overexploitation of surface and groundwater. As consumption of water grows, wastewater increases significantly and in the absence of proper measures for treatment and management, is polluting existing freshwater reserves. As a result, water pollution has emerged as one of the nation's gravest environmental threats.

This book draws a link between water pollution generated by different industries and the various economic activities of the Indian economy using the input-output framework. It constructs a detailed water pollution coefficient matrix involving different types of water pollutants.



## Newsletter

# International Input-Output Association (IIOA)

Number 27; Aug, 2014

The book estimates the total amount of water pollution generated directly and indirectly in different sectors and activities, and also calculates the water pollution content in India's foreign trade sector. It also accounts for defensive expenditure from water pollution and estimates Green GDP for the extent and scope of environmental challenges. Analysis of the result indicates the variation in the pollution content of different economic activities. Finally, the book offers a portfolio of policies and assesses the implications of such policies on pollution generation in India.

### Latest ESR articles

Economic Systems Research

Journal of the IIOA

Latest articles (up to 1<sup>st</sup> August 2014)



**COMPARING THE GTAP-MRIO AND WIOD DATABASES FOR CARBON FOOTPRINT ANALYSIS.** ARTO I., RUEDA-CANTUCHE J.M. and PETERS G.P.

We explore two different worldwide multi-regional input-output (MRIO) databases (Global Trade Analysis Project-MRIO and World Input-Output Database) for the calculation of the global carbon footprint (CF) of nations. We start our analysis with a description of the main characteristics of the databases and then make a comparison between their main components. Then, we calculate the CF with both databases and identify

(from a global perspective) the most relevant factors underlying their differences using structural decomposition analysis. On average, certain parts of both databases (e.g. intermediate uses and final demand) can be said to be similar for around 75% to 80%, with only a few elements in each part mainly driving the major differences. The divergences in the datasets of four countries explain almost 50% of the differences in the CF (the USA, China, Russia and India). Industry-wise, 50% of the differences can be explained by the divergences in electricity, refining and inland transport industries

**THE 'REST OF THE WORLD' – ESTIMATING THE ECONOMIC STRUCTURE OF MISSING REGIONS IN GLOBAL MULTI-REGIONAL INPUT-OUTPUT TABLES.** STADLER K., STEEN-OLSEN K. and WOOD R.

Incomplete data for the economic structure of numerous countries hamper the compilation of global multi-regional input-output (MRIO) tables. By themselves, most of these countries are of only limited importance for the global economy and incumbent environmental issues. Hence, in most recent global MRIO tables these countries are either roughly estimated or summarised in one rest of the world (RoW) region. Combining a wide range of countries, this RoW region may play a significant role in global economic and environmental accounts. We conceptualise the importance of RoW in several environmental footprint accounts and present algorithms to estimate the structure of RoW. The approach utilises the information of the economic structure within known parts of the MRIO table to estimate the unknown structure. Using this method, global

warming potential and employment footprints remain stable irrespective of the chosen initial estimates, whereas natural land use footprints and individual product impacts vary significantly.

**INVESTIGATING ALTERNATIVE APPROACHES TO HARMONISE MULTI-REGIONAL INPUT-OUTPUT DATA.** GESCHKE A., WOOD R., KANEMOTO K., LENZEN M. and MORAN, D.

Over recent years a small number of global multi-regional input-output (MRIO) databases were developed to describe the entire global economy at high sector detail. We investigate the differences that arise out of applying different construction procedures for two global MRIO databases: The EXIOBASE database, developed as part of the EU FP6 & 7 programs and the Eora database developed at the University of Sydney. The procedures used in EXIOBASE involve a high degree of interrogation and adjustment throughout the construction of the data set, whilst the Eora MRIO relies on single-step mathematical programming techniques and high-performance computing. We unravel the effect of the different approaches taken to develop the databases by undertaking a number of combinatorial experiments in which we exchange parts of the construction process between the EXIOBASE and Eora build pipelines. We conclude that Eora's highly automated data reconciliation approach produces MRIO databases that are of comparable quality to those constructed with EXIOBASE's multi-step approach. However, the reliability and robustness of the resulting MRIO database largely depend on the level of detail and reliability of the underlying data.



#### **CONVERGENCE BETWEEN THE EORA, WIOD, EXIOBASE, AND OPENEU'S CONSUMPTION-BASED CARBON ACCOUNTS.** MORAN D. and WOOD R.

In this paper, we take an overview of several of the biggest independently constructed global multi-regional input-output (MRIO) databases and ask how reliable and consonant these databases are. The key question is whether MRIO accounts are robust enough for setting environmental policies. This paper compares the results of four global MRIOs: Eora, WIOD, EXIOBASE, and the GTAP-based OpenEU databases, and investigates how much each diverges from the multi-model mean. We also use Monte Carlo analysis to conduct sensitivity analysis of the robustness of each accounts? results and we test to see how much variation in the environmental satellite account, rather than the economic structure itself, causes divergence in results. After harmonising the satellite account, we found that carbon footprint results for most major economies disagree by <10% between MRIOs. Confidence estimates are necessary if MRIO methods and consumption-based accounting are to be used in environmental policy-making at the national level.

#### **REGIONAL WATER FOOTPRINTS OF THE YANGTZE RIVER: AN INTERREGIONAL INPUT-OUTPUT APPROACH.** OKADERA T. OKAMOTO N. WATANABE M. and CHONTANAWAT J.

Recently, researchers have applied the multi-regional input-output (MRIO) approach to water footprint (WF) analysis. The concept of interregional input-output (R-MRIO) was developed to analyse regional issues. Researchers

have concentrated on the development of global or international input-output (N-MRIO) tables. Using the N-MRIO and the R-MRIO approach allows the study of global and regional issues, respectively. The WF is an indicator influenced by trade among nations and regions. However, the treatment of imports in an R-MRIO approach differs in whether international imports are separated or combined. We evaluate the effects of the difference between these models and discuss policy implications for the Yangtze River, China. The WF calculated using the combined type model is 11% larger than that by the separated type model. This difference can be ascribed to international imports, mainly internal consumption and interregional trade. We find that this difference affects social equity in water-abundant areas.

#### **A STRUCTURAL DECOMPOSITION APPROACH TO COMPARING MRIO DATABASES.** OWEN A., STEEN-OLSEN, K., BARRETT J., WIEDMANN T. and LENZEN M.

The construction of multi-regional input-output tables is complex, and databases produced using different approaches lead to different analytical outcomes. We outline a decomposition methodology for investigating the variations that exist when using different multiregional input-output (MRIO) systems to calculate a region's consumption-based account. Structural decomposition analysis attributes the change in emissions to a set of dependent determinants, such as technical coefficients, the Leontief inverse and final demands. We apply our methodology to three MRIO databases: Eora, GTAP and WIOD. Findings reveal that the variation between Eora

and GTAP can be attributed to differences in the Leontief inverse and emissions? data, whereas the variation between Eora and WIOD is due to differences in final demand and the Leontief inverse. For the majority of regions, GTAP and WIOD produce similar results. The approach in this study could help move MRIO databases from the academic arena to a useful policy instrument.

#### **EFFECTS OF SECTOR AGGREGATION ON CO2 MULTIPLIERS IN MULTIREGIONAL INPUT-OUTPUT ANALYSES.** STEEN-OLSEN K., OWEN A., HERTWICH E. and LENZEN M.

The past few years have seen the emergence of several global multiregional input-output (MRIO) databases. Due to the cost and complexity of developing such extensive tables, industry sectors are generally represented at a rather aggregate level. Currently, one of the most important applications of input-output analysis is environmental assessments, for which highly aggregate sectors may not be sufficient to yield accurate results. We experiment with four of the most important global MRIO systems available, analyzing the sensitivity of a set of aggregate CO2 multipliers to aggregations in the MRIO tables used to calculate them. Across databases, we find (a) significant sensitivity to background system detail and (b) that sub-sectors contained within the same aggregate MRIO sector may exhibit highly different carbon multipliers. We conclude that the additional information provided by the extra sector detail may warrant the additional costs of compilation, due to the heterogeneous nature of economic sectors in terms of their environmental characteristics.



#### **SUPPLY-USE FRAMEWORK FOR INTERNATIONAL ENVIRONMENTAL POLICY ANALYSIS.** TEN RAA T. and SHESTALOVA V.

The technical variation between countries in the production of goods and services, in terms of not only input coefficients, but also emission coefficients, creates scope for international trade to reduce environmental pressures. For this purpose we extend the theory of trade and the environment as to accommodate technical variation between countries in production and emissions. We use and steer close to the extended input and output tables, which include emission data. By treating environmental standards analogous to capital and labor capacity constraints, the aggregation problem for economic and environmental measures gets the same format as the well-understood aggregation problem for labor and capital. In a pilot application we determine the gains to free trade in products and emission permits.

#### **A SHOCK ABSORPTION INDEX FOR INOPERABILITY INPUT-OUTPUT MODELS.** TAN. R.R., AVISO K.B., PROMENTILLA M.A.B., SOLIS F.D.B., YU K.D.S. and SANTOS J.R.

Recent disasters have underscored the importance of enhancing resilience in economic systems. In this work, we propose a novel shock absorption index, which provides a measure of the ability of an economic system to tolerate disruptions. It is assumed that there are externally defined initial levels of system failure or disruption, as well as maximum allowable levels of inoperability for each sector. The shock absorption index is defined as the largest fraction

of the anticipated initial disruption that can be absorbed by the predefined robustness limits. It provides an overall measure of the robustness of an economic system towards a disruptive event, which is driven by both the economic structure and the individual robustness of different sectors. The results of two case studies illustrate policy-making insights in identifying and prioritizing risk management strategies for critical systems.

### Highlights in journals

#### **LÓPEZ L.A, CADARSO M.A., ZAFRILLA J.E. and ARCE G. (2014) ASSESSING THE IMPLICATION ON AIR POLLUTION OF AN ALTERNATIVE CONTROL-BASED CRITERION.** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES* 111(26)

In the letter entitled "Assessing the implications on air pollution of an alternative control-based criterion" authors respond to the paper published in PNAS, "China's international trade and air pollution in the United States" (Lin et al., 2014). Authors argue that the research results may differ if a more comprehensive international trade assignment responsibility criteria is used, instead of a consumption-based responsibility criterion. Specifically, a control-based criterion is proposed in this letter to allocate the responsibility to the firm's nationality, that in many cases split their production over thousands of kilometres away, in countries with weaker environmental policies. The main argument of authors is that the United States should also be responsible for the emissions embodied in goods that are produced in China by U.S. multinationals and are sold internationally.

#### **DEB PAL B. and POHIT S. (2014) ENVIRONMENTALLY EXTENDED SOCIAL ACCOUNTING MATRIX FOR CLIMATE CHANGE POLICY ANALYSIS FOR INDIA.** *JOURNAL OF REGIONAL DEVELOPMENT AND PLANNING* 3(1)

Linking economic growth and climate change is crucial policy issue for the developing economy and India is one among them. But to understand the implication of economic growth on GHG emission and input use efficiency improvement on economic growth, it requires an accounting framework which can integrate both the economic and environmental indicators. In this context this study has focused on construction of ESAM and further applied it to the ESAM multiplier model for impact analysis. The analysis presented in this study shows that 5% increase in overall export along with the 10% increase in efficiency in fertilizer, coal, petroleum and electricity use will boost the economic growth by around 2% and reduce CO2 emissions by around 11%. But this study also shows that the input use efficiency results cost advantages to the investors at a greater extent than employment generation and it cause further income inequality. However, the positive implication is that the efficiency improvement for input which are highly subsidised would improve economy's fiscal health which can further be used for employment generation.



**FENG K., HUBACEK K., SUN L. and LIU L. (2014)** CONSUMPTION-BASED CO<sub>2</sub> ACCOUNTING OF CHINA'S MEGACITIES: THE CASE OF BEIJING, TIANJIN, SHANGHAI, CHONGQING. *ECOLOGICAL INDICATORS*

China has experienced rapid urbanization in the last three decades, with more than half of the population living in cities since 2012. The extent of urban production and urban lifestyles has become one of the main drivers for China's CO<sub>2</sub> emissions. To analyze drivers of CO<sub>2</sub> emissions we use a consumption-based accounting approach that allocates all emissions along the production chain to the product and place of final consumption, whereas a production-based approach would allocate all emissions to the place of origin. In this study, we focus on the spatial distribution of production activities leading to CO<sub>2</sub> emissions across China as a consequence of final consumption in four Chinese mega cities: Beijing, Shanghai, Tianjin, and Chongqing. Urban consumption not only causes a large amount of emissions within its territory, but also imposes even much more emissions to its surrounding provinces via interregional supply chains. Results show that more than 48% of CO<sub>2</sub> emissions related to goods consumed in Chongqing and more than 70% for Beijing, Shanghai and Tianjin occurred outside of the respective city boundary. In addition to the usual focus on efficiency, our analysis adds insights into the causes of CO<sub>2</sub> emissions by looking at the drivers and types of consumption. Addressing consumption patterns in China's cities is critical for China's low carbon development.

**AKPAN U., GREEN O., BHATTACHARYYA S. and ISIHAK S. (2014)** EFFECT OF TECHNOLOGY CHANGE ON CO<sub>2</sub> EMISSIONS IN JAPAN'S INDUSTRIAL SECTORS IN THE PERIOD 1995-2005: AN INPUT-OUTPUT STRUCTURAL DECOMPOSITION ANALYSIS. *ENVIRONMENTAL AND RESOURCE ECONOMICS*.

This paper employs two-stage input-output structural decomposition analysis (SDA) to identify the factors responsible for changes in Japan's CO<sub>2</sub> emissions for two periods: 1995-2000 and 2000-2005. First, the study decomposes the total change in CO<sub>2</sub> emissions for each period to obtain the contribution of change in CO<sub>2</sub> emissions per unit output (CO<sub>2</sub> emissions coefficient), change in technology (technology effect), and change in final demand. The study observed from the first-stage decomposition that emissions coefficient and final demand drive the change in the first period (1995-2000) while the technology effect drives the change in the second period (2000-2005). The high contribution of the technology effect is driven by activities of iron and steel; coke, refined petroleum and gas; road transportation; and electricity sectors. Having observed the trend of the technology effect across the two periods, the study carried out a second-stage decomposition on technology effect in the second period to examine the contribution of each sector and observed that chemical and pharmaceuticals; iron and steel; road transportation; and construction sectors are mainly responsible. In conclusion, improvement in technical efficiency especially at the industrial process level of each industry will help Japan achieve greater level of CO<sub>2</sub> emissions reduction.

**KOOPMAN R., WANG Z. and WEI S.J. (2014)** TRACING VALUE-ADDED AND DOUBLE-COUNTING IN GROSS EXPORTS, *AMERICAN ECONOMIC REVIEW*, 104(2):459-494

This paper proposes an accounting framework that breaks up a country's gross exports into various value-added components by source and additional double-counted terms. Our parsimonious framework bridges a gap between official trade statistics (in gross value terms) and national accounts (in value-added terms), and integrates all previous measures of vertical specialization and value-added trade in the literature into a unified framework. To illustrate the potential of such a method, we present a number of applications including re-computing revealed comparative advantages and the magnifying impact of multi-stage production on trade costs.

**LOS B., TIMMER M.P. and DE VRIES G.J. (2014)** HOW GLOBAL ARE GLOBAL VALUE CHAINS? A NEW APPROACH TO MEASURE INTERNATIONAL FRAGMENTATION. *JOURNAL OF REGIONAL SCIENCE*

Denser networks of intermediate input flows between countries suggest ongoing international fragmentation of production chains. But is this process mainly taking place between countries within a region, or is it truly global? We provide new macroeconomic evidence by extending the Feenstra and Hanson (1999) measure of fragmentation to a multi-country setting. We derive the distribution of value added by all countries involved in the production chain of a particular final good. This is based on a new



input-output model of the world economy, covering 40 countries and 14 manufacturing product groups. We find that in almost all product chains, the share of value added outside the country-of-completion has increased since 1995. This is mainly added outside the region to which the country-of-completion belongs, suggesting a transition from regional production systems to "Factory World." This tendency was only briefly interrupted by the financial crisis in 2008.

**JOHNSON R.C. (2014)** FIVE FACTS ABOUT VALUE-ADDED EXPORTS AND IMPLICATIONS FOR MACROECONOMICS AND TRADE RESEARCH. *JOURNAL OF ECONOMIC PERSPECTIVES* 28(2):119-142

Due to the rise of global supply chains, gross exports do not accurately measure the amount of value added exchanged between countries. I highlight five facts about differences between gross and value-added exports. These differences are large and growing over time, currently around 25 percent, and manufacturing trade looks more important, relative to services, in gross than value-added terms. These differences are also heterogeneous across countries and bilateral partners, and changing unevenly across countries and partners over time. Taking these differences into account enables researchers to obtain better quantitative answers to important macroeconomic and trade questions. I discuss how the facts inform analysis of the transmission of shocks across countries; the mechanics of trade balance adjustments; the impact of frictions on trade; the role of endowments and comparative advantage; and trade policy.

**FENG K., PFISTER S., YANG Y. and HUBACEK K. (2014)** VIRTUAL WATER STRESS IN CHINA. *ENVIRONMENTAL SCIENCE & TECHNOLOGY* 48(14):7704-7713.

Water footprints and virtual water flows have been promoted as important indicators to characterize human-induced water consumption. However, environmental impacts associated with water consumption are largely neglected in these analyses. Incorporating water scarcity into water consumption allows better understanding of what is causing water scarcity and which regions are suffering from it. In this study, we incorporate water scarcity and ecosystem impacts into multiregional input-output analysis to assess virtual water flows and associated impacts among 30 provinces in China. China, in particular its water-scarce regions, are facing a serious water crisis driven by rapid economic growth. Our findings show that inter-regional flows of virtual water reveal additional insights when water scarcity is taken into account. Consumption in highly developed coastal provinces is largely relying on water resources in the water-scarce northern provinces, such as Xinjiang, Hebei, and Inner Mongolia, thus significantly contributing to the water scarcity in these regions. In addition, many highly developed but water scarce regions, such as Shanghai, Beijing, and Tianjin, are already large importers of net virtual water at the expense of water resource depletion in other water scarce provinces. Thus, increasingly importing water-intensive goods from other water-scarce regions may just shift the pressure to other regions, but the overall water problems may still remain. Using the water footprint as a policy tool to alleviate water shortage may only work when water scarcity is taken into account and virtual water flows from water-poor regions are identified.

**WIEDMANN T.O., SCHANDL H., LENZEN M., MORAN D., SUH S., WEST J. and KANEMOTO K. (2013)** THE MATERIAL FOOTPRINT OF NATIONS. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES*.

Metrics on resource productivity currently used by governments suggest that some developed countries have increased the use of natural resources at a slower rate than economic growth (relative decoupling) or have even managed to use fewer resources over time (absolute decoupling). Using the material footprint (MF), a consumption-based indicator of resource use, we find the contrary: Achievements in decoupling in advanced economies are smaller than reported or even non-existent. We present a time series analysis of the MF of 186 countries and identify material flows associated with global production and consumption networks in unprecedented specificity. By calculating raw material equivalents of international trade, we demonstrate that countries' use of nondomestic resources is, on average, about threefold larger than the physical quantity of traded goods. As wealth grows, countries tend to reduce their domestic portion of materials extraction through international trade, whereas the overall mass of material consumption generally increases. With every 10% increase in gross domestic product, the average national MF increases by 6%. Our findings call into question the sole use of current resource productivity indicators in policy making and suggest the necessity of an additional focus on consumption-based accounting for natural resource use.



# Newsletter

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**TIMMER M.P., ERUMBAN A.A., LOS B., STEHRER R. and DE VRIES G.J. (2014)**  
SLICING UP GLOBAL VALUE CHAINS. *JOURNAL OF ECONOMIC PERSPECTIVES* 28(2): 99-118

In this paper, we "slice up the global value chain" using a decomposition technique that has recently become feasible due to the development of the World Input-Output Database. We trace the value added by all labor and capital that is directly and indirectly needed for the production of final manufacturing goods. The production systems of these goods are highly prone to international fragmentation as many stages can be undertaken in any country with little variation in quality. We seek to establish a series of facts concerning the global fragmentation of production that can serve as a starting point for future analysis. We describe four major trends. First, international fragmentation, as measured by the foreign value-added content of production, has rapidly increased since the early 1990s. Second, in most global value chains there is a strong shift towards value being added by capital and high-skilled labor, and away from less-skilled labor. Third, within global value chains, advanced nations increasingly specialize in activities carried out by high-skilled workers. Fourth, emerging economies surprisingly specialize in capital-intensive activities.

### New book series launched: 'Developments in Input-Output Analysis'



Input-output analysis is seeing a renaissance through the rapid development of largescale models and databases and the need to understand and manage increasing global economic and environmental interdependencies. The new official book series of the IIOA provides a rich and diverse reference basis for new developments and

applications in input-output analysis. It captures theoretical and methodological innovations, demonstrates the applicability and versatility of input-output modelling and provides answers to real world problems. It aims at advancing the knowledge base on economic systems, structures and processes and their interaction with the natural environment at local, national or global level and over time. Primary audiences are researchers, practitioners, managers and government officials from economic, environmental, engineering and sustainability backgrounds.

Authors interested in submitting a book proposal for this new series should contact the series editors [Erik Dietzenbacher](#) or [Tommy Wiedmann](#) or the Publishing Editor [Fritz Schmuhl](#).

### A look into the past

#### Remembering Wassily Leontief

By José Javier Rodríguez Alcaide

Rose Maria Scanlon, director of Planning of the New York-New Jersey Port Authority, introduced me to Prof. Leontieff on 1984 regarding a mathematical model to simulate the temporal and spatial impact of a potential bridge/tunnel between Spain and Morocco. He received me at his office in Mercer Street (New York) where was located the institute that he managed since he joined New York University. Small office, small occupant; minimal desk inundated of books and a middle size classical blackboard where a clack was needed to write. On such green board, he requested me to show the mathematical model that we were designing and for which we wanted his cooperation.

Wassily, that he wanted to be identified in such a manner made him more familiar, was a very kind person. He not only attended me at his office in the institute that those days were directed by his former disciple Faye Duchin, but also invited me to share a day at his house in Connecticut and to walk in the surroundings of that holidays house. He indicated me the bus to take from New York City and the stop where he collected me with his car.

Leontief was very humble and wise, stoic and fighter, as shown by his life from St. Petersburg to Berlin, from there to Beijing and then to

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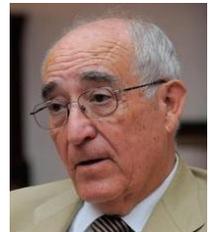


Wassily Leontief and José Javier Rodríguez Alcaide seated at the lobby of Hotel Conquistador (Córdoba, Spain), next to the [Cathedral \(old Mosque\)](#). Leontief insisted on lodging there so he could walk alone through the [Jewish and "axarquía" quarters](#) and in doing so recall his first visit to Córdoba in 1935.

Washington. His quantitative background addressed him from his double-entry accountancy to input-output tables. He came to Madrid for his advising role and visited me twice in Córdoba. The first, to recall his first visit to Córdoba in 1935, the second to receive an honoris causa doctorate from the University of Córdoba. He, a great lover of music and fine arts, attended the concerts of the Córdoba Orchestra at the Great Theatre and the restoration works of the baroque altarpiece of the church of the Merced's convent. Next month the restoration work he observed in 1986 will finally be completed.

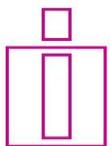
We visited each other sometimes accompanied by his wife, Stella. I will never forget our conversation while walking through the magnificent forest that surrounded his house in Connecticut. He told me: "*Professor Rodríguez, do as I do. Never step down from the cycle. Keep pedalling*"—good metaphorical advice to keep working until the end of our days.

Wassily Leontief, short and slim, a lover of walking, a cheerful conversationalist... he kept high spirits despite some lumbago. Close to the anniversary of his passing, I now and forever recall our meetings and our friendship.



*José Javier Rodríguez Alcaide*

Emeritus Prof. [University of Córdoba](#) (Spain)  
Fellow of the [Hispanic I-O Analysis Society](#)



# Newsletter

## International Input-Output Association (IIOA)

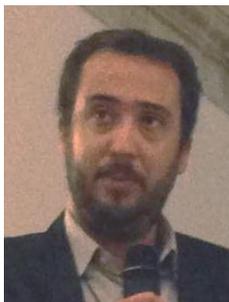
Number 27; Aug, 2014

### IIOA 2014 Wall of Fame

#### Flash sessions winners

##### **Michael C. Huang**

"CGE Applications to Handle Complex Data Issues"



##### **Joao-Pedro Ferreira**

"Shaping urban economies: a commuting satellite account"

##### **Christian Reynolds**

"Accounting for sleep: calculating the economic cost of sleep using Input-Output Analysis"



#### New IIOA fellow

##### **Erik Dietzenbacher**



#### New Leontief Prize

##### **Esteban Fernández**

"Empirical estimation of nonlinear input-output modelling: an entropy econometrics approach"



#### Paddle Tennis Tournament



##### **Winners:** (in the centre)

[Gaaitzen de Vries](#)  
and  
[Adolf Acquaye](#).

##### **Finalists:** (on the sides)

[Klaus Michel](#)  
and  
[Bart Hertveldt](#)



### Events



**33<sup>rd</sup> General Conference of the International Association to Research in Income and Wealth** August 24<sup>th</sup>-30<sup>th</sup>, 2014, Rotterdam (Netherlands)

Statistics Netherlands is proud to host this conference together with IARIW. The IARIW conference is a bi-annual meeting of academics and statisticians, focusing on topics closely related to national accounts and income and wealth distribution. The conference targets participants from universities and statistics offices from across the globe, offering an almost unique opportunity for discussion and exchange of ideas between academics and statisticians. Register now!



**INTERNATIONAL CONFERENCE ON NEW THINKING IN ECONOMIC THEORY AND POLICY.** September 13<sup>th</sup>-15<sup>th</sup>, 2014, Tokyo (JP)

Guest Speaker: Prof. H.D. Kurz (University of Graz)

Submit abstracts to [confyagi@kisc.meiji.ac.jp](mailto:confyagi@kisc.meiji.ac.jp) by July 31<sup>st</sup>. Full papers deadline: August 31<sup>st</sup>.

Contact: [Prof. Takashi Yagi](mailto:Prof. Takashi Yagi) (Meiji University)

Organized by: 



Co-sponsored by:



**4<sup>th</sup> SHAIO Workshop** September 25<sup>th</sup>-26<sup>th</sup>, 2014, Albacete (Spain)

The aim of the workshop is provide a forum to discuss last advances in the field of the Input-Output Analysis. For more information contact with [Luis Antonio López](mailto:Luis Antonio López) or [Jorge Enrique Zafrilla](mailto:Jorge Enrique Zafrilla). See more information at [SHAIO](http://SHAIO). Important dates are: Jul 31<sup>st</sup> full papers submissions, Aug 15<sup>th</sup> notification of acceptance. Registration is free for SHAIO members and a €30 fee applies (includes a year of SHAIO membership) to all other researchers. All specialists interested in topics related to input-output analysis are encouraged to attend.



**23<sup>rd</sup> International Input-Output Conference.** June 22<sup>nd</sup>-26<sup>th</sup> 2015, Mexico City (Mexico)

The School of Economics of the National Autonomous University of Mexico (UNAM) and the International Input-Output Association (IIOA) will join their forces and experience to organize the 23rd International Input-Output Conference in June 2015, to be held at the UNAM in Mexico City.

The National Autonomous University of Mexico (UNAM) is the largest and most important public higher education and research institution in Mexico and it is also among the best in Latin America.

The conference will take place in the Graduate Faculty of Economics building, from Monday June 22 to Friday June 26, 2015.

This building was built by the famous Mexican architect Ricardo Legorreta. It is located in the University Cultural Center, in the south part of the main campus.

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