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INTERNATIONAL INPUT-OUTPUT ASSOCIATION

Welcome from the Editor

Dear **IIOA** member,

I am very pleased to release the latest issue of the *International Input-Output Association Newsletter*. Many thanks, as always, to all of you that have contributed by sending your inputs.

This issue contains an end of year message from the IIOA President Sanjiv Mahajan, the latest ESR articles, highlights in Journals, and the announcements of several events and related courses. You can also find some job positions, a couple of new databases, and a special issue in the ESR. The Social Accounting Corner brings this time conversations with Faye Duchin and Yasuhide Okuyama. Additionally, in this issue, back by popular demand, we have the special acrostics created by Mike Lahr for us to enjoy during the winter holidays. Try to solve it before the next issue where I will publish the solution.

Any feedback, comments or suggestions are greatly appreciated. I also welcome contributions to future issues.

Andre Carrascal Incera
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Would you like to contribute to the IIOA newsletter?
Send us your news at newsletter@iioa.org

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An end of year message from the IIOA President – Sanjiv Mahajan

Dear IIOA Members,

As we near the end of another year, hope you and your families are all well. It is always good to reflect, sometimes it can be difficult but it can help you to shape your future.

It is sad to say that although we are trying to seek normality in our lives, we continue to live in difficult and uncertain times. For example, Coronavirus has not gone away, an unpleasant and unnecessary war continues, impact of the energy crisis on our costs of living is hardship for many, and most importantly, the impact of climate change is getting worse. Really hoping for a better 2023.

Congratulations to Argentina winning the 2022 World Cup. Greatest player of all time, Pele, Maradona, Messi in that order - enjoy the holiday debate …,

Moving to IIOA matters

This is my first year as President, it has gone quickly, a lot has been achieved and a lot more will be achieved in the future. We also started the year with two new Vice-Presidents and three new Council Members.

Lovely Conference evening setting & entertainment on Langkawi Island

Some of our key achievements in 2022 include:

- Top of the list – thanks to the considerable time, efforts and commitment from so many people to get us back to a **physical annual IIOA Conference** since 2019. This resulted in a highly successful event on the island of Langkawi in Malaysia. Thanks to all but a special mention to **Mohd Yusof Saari** (LOC Chair), **Shigemi Kagawa** (SPC Chair) and their teams.
- The **Conference next year** will be on the island of Alghero in Italy (26-30 June 2023). **Giorgio Garau** (LOC Chair) and **Jose Rueda-Cantuche** (SPC Chair) are progressing well - look forward to seeing you all there.
- Return of a regular IIOA **webinar series** and Webinar Corner webpage.
- Significant progress on the **Historical I-O Archives**.
- M**aintaining all of our regular activities** whether online or moving back to physical based events such as the ISIOA, ESR publications, Newsletter, etc.

Regarding **operations of the IIOA Council**, we are becoming more transparent to all Council Members of our processes of change, elections, etc. and more needs to be done.

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An end of year message from the IIOA President – Sanjiv Mahajan (continued)

A few years ago, the Council Members used to meet once a year during the Conference week at the end of a long day and went on beyond midnight!! Sometimes with just some nuts or crisps and alcohol for dinner!

Where are we now, this year we have:

- An Annual Council Meeting (on the Sunday before the Conference).
- Shifted towards a regular structure of online meetings:
  - Quarterly meetings covering regular business.
  - In-between, Specific Issue meetings, e.g., IIOA Long-Term Strategy, ISIOA way forward and ESR.
- More discussions, more decisions and more actions, allowing all to be involved and have their say and together with supporting agenda's and minutes.

The framework and structure of working is now in place and as mentioned, it is very different from five years ago. There is more openness and transparency of our processes enabling all the Council Members to contribute more effectively. The next phase of development is that we need to deliver more as reinforced by a recent review within the Council of its operations.

I would like to thank all Council Members for their help and steers through the year, and in particular continued sterling work and support by **Oliver Fritz** (Secretary), **Christof Paparella** (Treasurer) and **Elmar Hanlhofer** (webmaster).

As you are aware, we have the IIOA Council Elections underway and please do not forget to vote – your vote counts. I would like to say thank you to **Jose Rueda-Cantuche**, **Kirsten Wiebe** and **Norihiko Yamano** as out-going Council Members for their contribution to the work of the Council and Kirsten and Norihiko for their contributions as Vice-Presidents.

For me personally, with my father passing in the summer, much of August and September was written off. It has been a difficult time experiencing a new era without both parents and I have been in catch-up mode since. I always say, your personal health is numero uno priority, then health of your family, relations and friends, and then comes work. Also, do not do to others what you would not want done to yourself, always think twice. I always try to keep these perspectives in mind.

I would like to wish all of you and your families a wonderful, healthy and safe holiday period, happy new year and all the best for 2023.

Best regards,

Sanjiv

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Events

SHAIO events

Dear colleagues:

The School of Economics, Business and Tourism (FEET) and the Department of Applied Economic Analysis (DAEA) of the University of Las Palmas de Gran Canaria (ULPGC) are pleased to invite you to participate in the **9th Permanent Workshop** of the Hispanic-American Society of Input-Output Analysis (SHAIO) to be held in **September 2023 in the city of Las Palmas de Gran Canaria, Spain**.

Despite being the ULPGC a young institution, there are several researchers within the Department of Applied Economic Analysis who have developed their research activity in the area of Input-Output analysis, both preparing impact models and participating in the preparation, adjustment and updating of Input-output Tables and Social Accounting Matrices. This is why, the confidence granted by the Society to organize the 9th Permanent Workshop in the city of Las Palmas de Gran Canaria is a great satisfaction for us.

There are two main objectives of this event. In the first place, it is intended to grant a special role to the work carried out by young researchers whose presentation will be valued by a senior researcher (discussant). The second objective is to increase the participation of researchers from Latin America. Being aware of the greater difficulties to participate in person in events held outside the American continent, the organization of the IX Permanent Workshop of SHAIO has decided to adopt an online session dedicated as a priority to the contributions of researchers from Latin America as well as everyone who may not be able to assist to the workshop in person. On the other hand, the organizing committee has planned the possibility of following all the sessions of the event online in the main room. The official languages of this event are Spanish and English. Abstracts and papers may be submitted in either of these two languages.

We are sure that the hospitality that characterizes our islands will offer, at the next meeting, the most favorable conditions to share and discuss our latest work. This ninth meeting is yet another example of the consolidation of these meetings, which have constantly and uninterruptedly given us the opportunity to collectively address all relevant issues on our research agenda.

Key Dates:

- **Abstract submission** → May 15, 2023
- **Notification of acceptance** → June 15, 2023
- **Full paper submission** → July 15, 2023
- **Registration deadline** → July 15, 2023
- **Workshop** → September 4-5, 2023

Please visit our website for more info:
https://wio9.shaio.es/en/
Looking forward to see you in Las Palmas de Gran Canaria!

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GI-NI International Conference

University of Agder, Campus Gimlemoen, Kristiansand, Norway.
May 25, 2023.

Over the past decades, inequality within populations has widened in the majority of countries regarding many dimensions of life. This has been of central concern for both policymakers and researchers alike. To formulate remedies, we must have an integral understanding of the drivers of such widening inequality and their interactions. In addition, we must understand the strengths and weaknesses of our current institutions to deal with these issues. This conference aims to bring together researchers from different disciplines to share and discuss their recent findings related to widening income inequality, living standards, and prosperity more broadly.

Researchers from all fields of economics, political science and sociology are invited to present new research results and discuss possible directions for future research activities. We welcome the submission of papers with an empirical, theoretical, and/or policy orientation focusing on micro- or macroeconomic aspects of inequalities linked to globalisation, migration and technological change. The analysis should focus on Europe or be related to it.

Please submit (in pdf format) an extended abstract of your paper (approx. 800 words) or the complete paper along with a cover letter including i) paper title, ii) name(s) of the author(s), and iii) affiliation as well as the email address of the presenting author, to Professor Dr. Steven Dhondt.

Abstracts must include context, purpose, methodology, major findings, implications and keywords. The criteria for selection of papers will be: relevance to the conference theme, quality of methodology, originality, embedding in the literature and soundness of conclusion/s.

Extended abstract submission	30 January, 2023
Notification of acceptance of abstract	28 February, 2023
Last date for submission of selected papers	28 April, 2023
Last date for registration	1 May, 2023

Call for papers Webpage More info

Registration for participation for presenting attendees is 1 May 2023. Furthermore, please note that it is possible to attend the conference without presenting a paper. Enquiries for non-presenting attendees should be made by the online registration form no later than 1 May, 2023. This conference benefits from the financial support of the European Commission, through the GI-NI (H2020) project and participation is free of charges.

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26th Annual Conference on Global Economic Analysis

"Broadening Engagement in a Resilient and Sustainable International Trading System"

June 14-16, 2023

The goal of the conference is to promote the exchange of ideas among economists conducting quantitative analysis of global economic issues. Particular emphasis will be placed on applied general equilibrium methods, data, and application. Related theoretical and applied work is also welcome.

The overall theme of the conference is *"Broadening Engagement in a Resilient and Sustainable International Trading System"* with subthemes on:

- Handling sudden global disruptions (pandemic, war)
- Handling slow onset disasters (climate change and biodiversity loss)
- Innovation strategies of socio economic factors
- Inequalities between and within countries
- Globalization dynamics and financial markets

GTAP Global Trade Analysis Project

université de BORDEAUX

BxSE Bordeaux Sciences Economiques Bordeaux School of Economics

The conference is structured with the intent of maximizing discussion and the exchange of ideas among researchers. Speakers will be asked to discuss the highlights and implications of their work with a dedicated amount of time devoted to discussion. Plenary speakers will be allotted 30 minutes for presentation, followed by 20 for discussion. Breakout session presenters (unless otherwise noted) will be allotted 20 minutes for presentation, followed by 10 for discussion.

Check for more information on the plenary speakers, submissions, Early Career Researcher Travel Funding Opportunities, GTAP Conference Scholars Program and more at the Webpage of the event.

Dates/Deadlines (USA Eastern Time Zone)

Preliminary Submissions	
Abstracts	Nov 7 - Jan 15
Organized Session Proposals	Nov 7 - Jan 15
Travel Funding Applications	Nov 7 - Jan 15
GTAP Conference Scholars Program	Nov 7 - Jan 15
Abstract Review	Jan 20 - Feb 12
Status Notifications	Feb 28
Accepted Paper and Presentation Submissions	
Paper Submission	Apr 15
Registration	
Registration	Feb 28 - Apr 23
Payment	Apr 30

Ginger Batta (gbatta@purdue.edu)
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Related I-O courses

19th WEM: Computable General Equilibrium Analysis of Global Challenges using GTAP in GAMS and MPSGE

Department of Applied Economic Analysis at the University of Las Palmas de G.C. (Canary Islands, Spain), 13th – 17th March, 2023

Instructors:
Prof. Thomas Rutherford
Prof. Christoph Böhringer
Ass. Prof. Casiano Manrique

ULPGC Universidad de Las Palmas de Gran Canaria

Responses to global challenges such as climate change, international trade conflicts, or disruptions in global supply chains should be based on the systematic impact assessment of alternative policy options. The economic analysis of policies affecting markets in multiple countries requires both data and theory. We provide computational tools developed in the GAMS modeling language to extract the GTAP data base of the global economy. We use empirical GTAP data for computable general equilibrium (CGE) analysis facilitated by MPSGE as a meta-language to implement CGE models in a compact non-algebraic manner. The workshop will demonstrate the practical usefulness of CGE analysis by means of policy-relevant applications to carbon tariffs in climate policy, disruptive trade policies, and supply chain shocks.

The explicit algebraic formulation of general equilibrium conditions and the parameterization of functional forms to characterize technologies and preferences can become very tedious and error-prone in particular for more complex production and consumption patterns. MPSGE (Mathematical Programming System for General Equilibrium) provides a short-hand non-algebraic representation for general equilibrium models releasing economists from the need to write down complicated equilibrium conditions explicitly as well as from the need to set up tedious calibration routines for the parameterization of demand and supply functions. The workshop will show in detail how to transform algebraic CGE models into non-algebraic MPSGE syntax which can substantially lower the entry barriers and time cost of CGE analysis n both – algebraic and non-algebraic – cases, CGE models are stated as mixed complementarity problems (MCP) which link equilibrium conditions as nonlinear inequalities with complementary non-negative economic variables. The fundamental strength of CGE models implemented as MCP is the ability to handle corner solutions and regime shifts that might be central to the analysis of discrete production decisions (e.g. firm location) or the selection of international value chains (e.g. switching of trade links).

The workshop will consist of six segments:
Part 1: GTAP in GAMS
Part 2: Economic Equilibrium and Mixed Complementarity Problems (MCP)
Part 3: MPSGE Implementation of Algebraic General Equilibrium Models
Part 4: A Canonical Global Trade Model based on GTAP in GAMS
Part 5: Applications to the Economic Analysis of Global Challenges
- Unilateral carbon pricing and border carbon adjustments.
- Impact assessment of international trade wars,
- Hedging policy against supply chain disruptions.

Enrollment is limited to 20 participants to assure efficient, close interaction. For further information please check: http://www.ulpgc.es/webs/wem/
or the courses section on: http://www.gams.de

DEPARTAMENTO DE ANÁLISIS ECONÓMICO APLICADO

ULPGC Universidad de Las Palmas de Gran Canaria | Facultad de Economía, Empresa y Turismo

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Databases

The Industry and Competitiveness Group (GIC) of the Federal University of Rio de Janeiro (UFRJ) published through Passoni and Freitas (2022) an **annual series of deflated Input-Output Tables (IOTs) estimative from 2000 to 2019 for the Brazilian economy** considering a chained System of National Accounts.

This working paper (available now only in Portuguese) also evaluates the effect of deflation for the economic analysis associated with the technical coefficients of the input-output model. The deflated MIP series were estimated at the previous year's prices, in total units (single deflator) and in volume units (element-specific deflators).

Working Paper:

Como deflacionar matrizes insumo-produto? Uma proposta de uma série deflacionada para o Brasil no SCN 2010.
Patieene Alves-Passoni and Fabio N. P. Freitas Link

Database accessible at: https://www.ie.ufrj.br/gic-publicacoes.html

The **EMERGING** model is a new global MRIO framework based on bilateral trade data and national statistics at the individual country level. The contributions are (1) global scale and including emerging economics to the largest extent; (2) containing enough detail on sectors to capture structural changes in supply chains and economic developments; (3) covering changes over time; (4) up-to-date representation of changes to allow for timely policy implications; and (5) using modular compilation for timely updates.

Based on this model framework, the **EMERGING MRIO** database now covers 135 sectors in 245 economies over the period 2015-2019. It will be an essential tool to conduct supply-chain and environmental impact analysis, especially for global emerging economies.

The **EMERGING** model includes nine modules and adopts corresponding compilation procedures according to the data source and the economy. The methodology paper on EMERGING MRIO construction is published in the Journal of Industrial Ecology recently (https://doi.org/10.1111/jiec.13264). The full database is open access: https://ceads.net/.

Queries about the EMERGING database and further collaboration can be addressed to:

Jing Meng: jing.j.meng@ucl.ac.uk

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Published papers and books in Input-Output Analysis and related methods

Economic Systems Research
Journal of the IIOA
Volume 34, Issue 4, 2022

Rossella Bardazzi & Leonardo Ghezzi

Large-scale multinational shocks and international trade: a non-zero-sum game

International trade has improved living standards but has also become a major channel for spreading shocks on a global scale. The increasing relevance of intersectoral linkages and trade in intermediates renewed interest in input–output techniques. This paper enriches the literature on empirical trade models with an input–output/econometric approach including substitution effects and price spillovers. Our model shows that (a) trade elasticities and bilateral shares are not constant in time and differ across sectors and countries; (b) international price changes alter the relative competitiveness between competitors; (c) final demand components such as consumption and investment react to changes in international prices. Large multi-country shocks produce feedback effects in national economies as they adapt by import substitution across exporters, by changing the import content of domestic production and by adjusting final demand. These feedbacks affect the global demand producing an asymmetric non-zero-sum game.

Yoshihiro Hashiguchi, Norihiko Yamano & Colin Webb

How thick is your armour? Measuring economic resilience to shocks in global production networks

When economic shocks occur, whether at home or abroad, economic agents are expected to react to reduce the negative impact or amplify the positive effects. The ability of a country to contain economic losses can be defined as the resilience to economic shocks. Using the OECD's annual Inter-Country Input–Output (ICIO) tables from 1995 to 2011, this paper investigates the relationship between changes in final demand and production structures for 61 economies. We found that, during economic downturns, countries that are able to prop up the economy through the domestic service sectors instead of domestic goods and foreign sectors are more resilient to negative shocks. Therefore, understanding the substitutability between goods and service sectors and between domestic and foreign sectors is crucial for gauging the potential risk to a country's domestic economy from shocks abroad – whether economic, environmental, health-related or political.

Timothé Beaufils & Leonie Wenz

A scenario-based method for projecting multi-regional input–output tables

Multi-regional input–output (MRIO) data are a powerful tool to analyze complex interdependencies in the international trade and supply network. Their field of application is however limited by the fact that MRIO datasets are only available for past years whereas the structure of the international trade network has been found to change profoundly over time. We here propose the SPIN method, a simple and flexible algorithm that can project MRIO tables into the future based on transparent scenarios of how gross domestic product and trade relations may evolve in that time. By combining well-established input–output techniques, namely the Leontief quantity model and an RAS-type algorithm, our method provides a straightforward mean to convert quantitative scenarios of the world economy into consistent MRIO tables. We illustrate the functioning of the SPIN method by projecting the evolution of the trade network after the 2008 financial crisis under different alternative scenarios of recovery.

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Timon Bohn, Steven Brakman & Erik Dietzenbacher

Who's afraid of Virginia Wu? US employment footprints and self-sufficiency

Globalization has brought about concerns of domestic job losses due to outsourcing to countries like China. The 'employment footprint' concept provides new insights into the implications of trade for employment. Using this approach for the period of 1995–2008, we analyze the relation of US jobs with international trade, particularly with China. Furthermore, we compare the US employment footprint with its labor endowment to assess if the country could be self-sufficient in terms of labor. We find that the US's consumption increasingly depends on foreign workers. The country 'consumes' more labor than is nationally available; thus, self-sufficiency is not possible under realistic assumptions. Moreover, the US has benefited from jobs – especially in services – generated by the world economy. Referring to Albee's famous play about living in illusions, we use 'Virginia Wu' as a Chinese version of 'Virginia Woolf' to argue that the perceived threat of China (Virginia Wu) is only an illusion.

Arndt Feuerbacher, Scott McDonald & Karen Thierfelder

Peasant farmers and pandemics: the role of seasonality and labor-leisure trade-off decisions in economy-wide models

Pandemics attack the primary asset (labor) of peasant households and the rural poor. Peasant households must simultaneously allocate labor between farm and household activities, where the demand for agricultural labor is seasonal, which limits intra-temporal substitution, without perfect foresight. A pandemic reduces the supply of labor, through deaths and morbidity, with the scale of reductions in labor supply depending on the seasons in which a pandemic occurs. The analyses, using a recursive dynamic economy-wide model for Bhutan, demonstrate that outbreaks in high labor demand seasons cause increases in wage rates almost three times as high as for outbreaks in low labor demand seasons. Increases in wage rates induce peasant households to reallocate labor time between farm and household activities through the labor-leisure trade-off mechanism. Such changes in the allocation of labor time are important elements of peasants' mitigation responses, and can reduce the negative economic implications of a pandemic.

Heran Zheng, Johannes Többen, Erik Dietzenbacher, Daniel Moran, Jing Meng, Daoping Wang & Dabo Guan

Entropy-based Chinese city-level MRIO table framework

Cities are pivotal hubs of socioeconomic activities, and consumption in cities contributes to global environmental pressures. Compiling city-level multi-regional input-output (MRIO) tables is challenging due to the scarcity of city-level data. Here we propose an entropy-based framework to construct city-level MRIO tables. We demonstrate the new construction method and present an analysis of the carbon footprint of cities in China's Hebei province. A sensitivity analysis is conducted by introducing a weight reflecting the heterogeneity between city and province data, as an important source of uncertainty is the degree to which cities and provinces have an identical ratio of intermediate demand to total demand. We compare consumption-based emissions generated from the new MRIO to results of the MRIO based on individual city input-output tables. The findings reveal a large discrepancy in consumption-based emissions between the two MRIO tables but this is due to conflicting benchmark data used in the two tables.

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Latest ESR articles

Economic Systems Research
Journal of the IIOA
Latest articles (up to 26th of Nov.)

Volkan Recai Cetin
When do public transport investments really matter? A CGE analysis for Türkiye

In this study, the economic impact of public transport investments which have been extensively used as an investment policy tool in Türkiye is analysed from different fiscal policy and financing perspectives by employing a dynamic computable general equilibrium (CGE) model. The impact of public transport investments on key economic performance indicators of real GDP growth and unemployment and macroeconomic vulnerability indicators were investigated in alternative scenarios involving such different financing mechanisms as tax revenues, external borrowing, and public–private partnerships. The results assert that public transport investments stimulate economic growth and employment. Nevertheless, the financing mechanism is an essential factor that determines the level of the impact, its sustainability and in some cases its direction.

Aleix Altimiras-Martin
A supply-driven model consuming simultaneously all primary inputs: unfolding analytical potential beyond the Ghosh model

The Ghosh model fails to endogenise the simultaneous consumption of primary inputs and, consequently, is unused. It is argued that this limitation stems from being specified mirroring the Leontief model. In particular, primary inputs are considered homogeneous and independent despite being heterogeneous and (intersectorally) dependent. A new supply-driven model endogenising the consumption of all primary inputs except the one driving the model is developed. It displays new features: structural linearity and structural variability. An input multiplier analysis illustrates that the new model's total requirements matrix represents the actual structure of the economy, overcoming the Ghosh model's 'limitation'. Also, it is exemplified how to use complementary information from the Ghosh model to deepen structural analyses. Thus, this paper solves a long-lasting theoretical inconsistency in IO modelling and unfolds new analytical potential, hopefully rekindling the interest in supply-driven analyses.

Mohammad Masudur Rahman & Anna Strutt
Costs of LDC graduation on market access: evidence from emerging Bangladesh

We empirically estimate the costs of LDC graduation on market access for Bangladesh using a computable general equilibrium modelling framework. If developed countries impose standard generalized system of preferences (GSP) tariffs while importing from Bangladesh and at the same time Bangladesh eliminates its export subsidies, our modelling suggests that real gross domestic product (GDP) may drop by about 0.38 per cent and exports could fall by about six percent for Bangladesh. The ready-made garment sector could be affected severely, with results suggesting exports could decline by about 14 per cent. Our analysis indicates that the income of urban households could decrease by three per cent, and household consumption may shrink by about four per cent. To minimize these potentially adverse impacts, Bangladesh should aim to ensure market access continues through signing preferential trade agreements. In addition, streamlined subsidy policies, enhanced domestic productivity, export diversification, and increased foreign investment, are likely to be important areas of focus for a smooth LDC graduation.

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Meihui Jiang, Cai Suo, Liangpeng Wu & Peter Berrill
Consumption structure optimization for reducing energy footprint

To investigate how to obtain the optimal balance between energy consumption and economic development, this paper proposes a multifactor optimization model (MFOM). Different from previous input–output optimization models, our proposed MFOM comprehensively considers the direct and indirect impacts of sectoral consumption activities on total energy consumption. The results show that MFOM achieves higher energy-saving goals by smaller adjustment to consumption activities than the previous input–output optimization models do. The results also show that the consumption of some products should be limited to achieve the energy-saving and economic growth goals, such as Non-ferrous Metal Ore Mining, Chemical Products and Ferrous Metal Ore Processing. Furthermore, the results indicate that the share of some sectors, especially high-level manufacturing sectors, significantly decreases in the consumption structure after optimization. To maintain the sustainable development of these sectors, the dependence of their production activities on energy-intensive products should be reduced.

Pablo R. Liboreiro
Estimating disguised unemployment in major middle-income countries by means of non-linear input–output analysis, 2000–2014

According to the disguised-unemployment hypothesis, significant wage differences between sectors in less-developed countries result from segmented labour markets and overcrowding of the flexible market segment. So stated, this hypothesis implies a way to measure non-open unemployment: by the amount of labour that must be withdrawn from the market for relative wages to change. Indeed, it is possible to undertake the exercise of comparing the actual employment of a country with a simulated 'non-dualistic' employment by means of a non-linear input-output model and taking the US wage structure as a benchmark. This simulation experiment was carried out for seven middle-income countries (Brazil, China, Indonesia, India, Russia, Mexico, and Turkey) using data from the 2016 Release of the World Input–Output Database. The results of the study are consistent with the disguised-unemployment hypothesis, as well as with related literature.

Joel Bruneau, Madanmohan Ghosh, Deming Luo & Yunfa Zhu
Income and investment, not energy policy, are driving GHG emission intensities

Global greenhouse gas (GHG) emissions continue to rise but, at the same time, emission intensities associated with domestic consumption and territorial production have declined albeit at vastly different rates across economies. To identify the socioeconomic factors that drive this cross-country variation, we combine input–output modelling with panel data analysis. Using the World Input–Output Database, we estimate GHG intensities separately for domestic consumption and for territorial production. For the regression analysis, we consider several socioeconomic factors that capture development features, exposure to international trade, as well as energy prices and GHG-relevant programmes. Our results show that development-type factors, such as per capita income, capital-labour ratios, and investments, are the primary drivers of cross-country differences. Energy prices and domestic GHG policies are not major drivers. We also find that reductions in intensities are primarily through changes in techniques rather than compositional changes in the structure of economies.

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Highlights in journals

Casiano Manrique-de-Lara-Peñate, María Santana Gallego & Elisabeth Valle Valle
The economic impact of global uncertainty and security threats on international tourism
Economic Modelling

Uncertainty and safety issues limit the expansion of the tourism sector. Previous literature has explored the impact of security problems on tourist flows, especially terrorism. However, the difficulty of measuring tourism in monetary terms has limited the ability to evaluate the economic costs of security and uncertainty. This paper brings together a worldwide gravity model for international tourist arrivals from 1995 to 2016 and an inter-country input-output model for estimating the economic impact of terrorism, corruption and economic policy uncertainty in monetary terms. The research provides estimates of variations in tourist arrivals and value added under different scenarios, ranging from total security to maximum insecurity and uncertainty values at country and regional levels. Results show that the value added generated by tourism would increase by 14.3% if uncertainty and insecurity in each of the countries fell to their minimum level, and would decrease by 17.5% if they increased to their maximum level.

André Carrascal-Incera & Geoffrey J. D. Hewings
Income Interdependence in the UK Multi-Regional Economy: A Meso-Level Analysis
International Regional Science Review

Consumer expenditures in the United Kingdom account for over 50% of Gross Domestic Product on the expenditure side, yet their impact on economic activity is often overshadowed by attention to technological change, value chain analysis and especially international trade. In this paper, a recently developed interregional model of the UK economy, SEIM (Socio-Economic Impact Model) will be used to provide some parallel perspectives to the role of interregional trade in goods and services by focusing on the interregional structure and impact of income and expenditures by households. Drawing on the original contributions of Miyazawa (1976) to highlight the contribution and structure of income interdependence complemented by interpretations offered by average propagation length, field of influence, and feedback loop analyses. The findings reveal the nature and strength of asymmetries in the structure of income formation and their impacts across the multiregional system. While there is only modest variation in aggregate income propagation by region, the accumulation of income is dominated by regions in the London area and secondarily by other metropolitan areas providing a source of explanation for the sustained income inequalities that have characterized the UK economy for almost a century.

Emmanouil Tranos, André Carrascal-Incera & George Willis
Using the Web to Predict Regional Trade Flows: Data Extraction, Modeling, and Validation
Annals of the American Association of Geographers

Despite the importance of interregional trade for building effective regional economic policies, there are very few hard data to illustrate such interdependencies. We propose here a novel research framework to predict interregional trade flows by utilizing freely available Web data and machine learning algorithms. Specifically, we extract hyperlinks between archived Websites in the United Kingdom and we aggregate these data to create an interregional network of hyperlinks between geolocated and commercial Web pages over time. We also use existing interregional trade data to train our models using random forests and then make out-of-sample predictions of interregional trade flows using a rolling-forecasting framework. Our models illustrate great predictive capability with R2 greater than 0.9. We are also able to disaggregate our predictions in terms of industrial sectors, but also at a subregional level, for which trade data are not available. In total, our models provide a proof of concept that the digital traces left behind by physical trade can help us capture such economic activities at a more granular level and, consequently, inform regional policies.

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Bin Su & B.W. Ang
Improved granularity in input-output analysis of embodied energy and emissions: The use of monthly data
Energy Economics

Input-output (I-O) analysis has been widely used in national energy and energy-related emission studies. These studies are generally conducted using annual data. In a growing number of countries, significant variations in renewable energy supply and in final demands of goods and services are observed over time within a year. These temporal variations cannot be captured in I-O analysis using annual data. To investigate such temporal dynamics, we propose an I-O analysis framework that uses monthly data. Further to that, the drivers in embodiments and aggregate embodied intensity (AEI) indicators are studied via Structural Decomposition Analysis (SDA). Additive SDA and multiplicative SDA are applied to reveal the temporal dynamics associated with energy and emission embodiments and AEI indicators, respectively. An application study using China's 2018 datasets show the importance of temporal dynamics in studying its embodiments and AEI indicators, with drivers of their changes show significant variations over months. It is shown that increased data granularity reveals useful information which would otherwise undetected if annual data are employed. Implications of the findings on future research are discussed.

Sheng Zhong, Tian Goh & Bin Su
Patterns and drivers of embodied carbon intensity in international exports: The role of trade and environmental policies
Energy Economics

International production fragmentation has generated and reallocated value added as well as CO2 emissions across economies. Prior studies have mainly focused on the embodied emissions or value added in trade. The evidence regarding the embodied emission intensity, and particularly the role of policies, however, remains sketchy. This paper investigates the role of trade and environmental policies in embodiment flows by combining input-output analysis and the gravity model of trade, covering 43 economies over 2000–2014. First, we derive the domestic carbon and value-added contents of bilateral exports in an input-output framework, and find a declining trend in emission intensity in exports. Second, we use the gravity model to examine the determinants of trends in both flows, and further infer the combined effects on intensity. The results show that an open trade policy can lower emission intensity in exports by facilitating the selection of products that are higher in value-added but less emission-intensive. Economies with more stringent environmental policies have a lower emission intensity in exports, but a higher emission intensity in their imports, which suggests carbon leakage. Effective global climate mitigation will require a closer look at the emission intensity in exports and collective action to address the detrimental effects of carbon leakage.

Susana Santos
National Accounts of Portugal in 2018. Integrated economic accounts, matrix representations and extensions
MPRA (Munich Personal RePEc Archive)

Despite the importance of interregional trade for building effective regional economic policies, there are very few hard data to illustrate such interdependencies. We propose here a novel research framework to predict interregional trade flows by utilizing freely available Web data and machine learning algorithms. Specifically, we extract hyperlinks between archived Websites in the United Kingdom and we aggregate these data to create an interregional network of hyperlinks between geolocated and commercial Web pages over time. We also use existing interregional trade data to train our models using random forests and then make out-of-sample predictions of interregional trade flows using a rolling-forecasting framework. Our models illustrate great predictive capability with R2 greater than 0.9. We are also able to disaggregate our predictions in terms of industrial sectors, but also at a subregional level, for which trade data are not available. In total, our models provide a proof of concept that the digital traces left behind by physical trade can help us capture such economic activities at a more granular level and, consequently, inform regional policies.

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Łukasz Lach
Optimization based structural decomposition analysis as a tool for supporting environmental policymaking
Energy Economics

A new tool for supporting environmental policymaking presented in this paper combines the ease of interpretation of structural decomposition analysis in the environmentally extended input-output (EEIO) model with versality of MINLP optimization. The approach allows finding those coefficients in EEIO model in the case of which a small change of their levels leads to a large reduction of industrial GHG emissions. In the illustrative empirical example the proposed approach is first implemented in GAMS and next used to identify GHG-emissions-important IO coefficients in Poland.

Yuwan Duan, Erik Dietzenbacher, Bart Los, Ruochen Dai
Regional inequality in China during its rise as a giant exporter: A value chain analysis
Journal of Regional Science

China's exports success has implications for regional income inequality, because most of its export products are manufactured in the coastal zone. We propose a value chain-based accounting framework to quantify the contributions of exports to regional income inequality. We employ newly developed interregional input–output tables for China, which distinguish between processing export activities and ordinary export activities. We analyze the period 2002–2012, the decade during which China became the "Factory of the World." We find that an RMB of processing exports contributed much more to regional inequality than an RMB of ordinary exports or domestic final demand. Still, changes in regional inequality (increasing in 2002–2007 and decreasing between 2007 and 2012) are much more due to rising ordinary exports in the first subperiod and the growth of domestic final demand coupled with changes in the configuration of value chains in the second.

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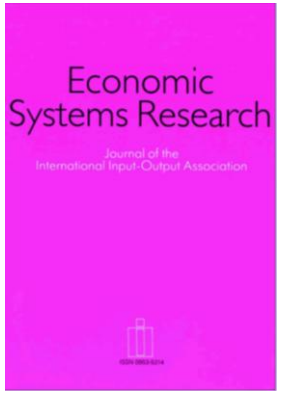
Special Issue



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Gender in Input-Output Analysis

Long-term economic growth is the result of a complex interplay of technological factors, structural change, consumption patterns, and gains in productivity and competitiveness. In this context, a change in any of the above-mentioned factors has different impacts in women and men and in the so-called gender gaps, with no identical effects in all economies and countries.

Input-output analyses have an important potential to be implemented and be able to analyse and explain some structural determinants of gender differentials that have been identified in the literature. The development of Global Value Chains, for instance, brings a new perspective to the analysis. It allows us to revisit old research questions related to the factors that promote or dampen employment and payment gender gaps, vertical and horizontal segregation, polarisation, etc.

This Special Issue aims at filling this knowledge gap with works that analyse different aspects of gender and economics applying input-output methodology. Insights on a broad spectrum of themes are welcomed, including, but not restricted to:

- Inclusion of the gender factor in social footprints
- Development of gender-aware general equilibrium models to evaluate the impact of different gender policies
- Role of women in the economic growth and structural change of developed and developing countries
- Efforts to value and include unpaid and care work in multisectoral models
- Approximations to the economic impact of gender violence,
- Effects on employment and payment gender gaps of different international experiences of trade liberalisation, etc...

Multidisciplinary contributions on the above and related topics are invited. Contributions may be based on theoretical analyses, empirical investigations, comparative or in-depth studies.

More info

Manuscript deadline
26 January 2023

SUBMIT AN ARTICLE

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INTERNATIONAL INPUT-OUTPUT ASSOCIATION

Job Positions

UNIVERSIDAD POLITÉCNICA DE MADRID

More info

Researcher in Environmentally Extended Input-Output Analysis

TASKS:

Greenhouse gases and air pollutants inventories must be prepared through Input-Output Analysis processing data from the madrid region. The tasks will be: 1) Documenting the state of the art, 2) Study of alternatives, 3) Management and processing of information, 4) Preparation of inventories, 5) Analysis of results, 6) Communication of results.

SKILLS-QUALIFICATIONS:

1) Clear knowledge of the input-output methodological framework.

2) Capacity to process input-output databases for the assessment of environmental impacts.

3) Interest in consumption behaviors and its impacts.

4) Experience in projects related to the measurement of environmental impacts in cities through input-output analysis.

BENEFITS:

Common benefits applied to the staff of the Universidad Politécnica de Madrid.

ELIGIBILITY CRITERIA AND SELECTION PROCESS:

The guidelines established in the new Regulation (HRS4R) are applied.

ADDITIONAL COMMENTS:

Contact information and availability for personal interview must be provided.

Check for other regular publications of job openings at:

OECD
BETTER POLICIES FOR BETTER LIVES

The Organisation for Economic Co-operation and Development (OECD) is an international organisation that works to build better policies for better lives. Our goal is to shape policies that foster prosperity, equality, opportunity and well-being for all.

More info

European Commission

As the science and knowledge service of the Commission, the mission of DG Joint Research Centre is to support EU policies with independent evidence throughout the whole policy cycle.

The JRC is located in 5 Member States (Belgium, Germany, Italy, the Netherlands and Spain). Further information is available at: https://ec.europa.eu/jrc/

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INTERNATIONAL INPUT-OUTPUT ASSOCIATION

The Social Accounting Corner

Questions: 1) How did you learn about Input-Output for the first time? Can you remember your first thoughts? 2) Which was your first IIOA conference? Any memory that you want/can share? 3) Recommend the readers of the newsletter a paper that surprised or inspired you.

Yasuhide Okuyama – Professor, Graduate School of Social System Studies, University of Kitakyushu (Japan)

1) I encountered input-output analysis in early 1980 or 1981 when I was an undergraduate student at the University of Tsukuba, Japan. One of the required courses was an introduction to economics, a year-round course covering introductory micro- and macroeconomics, but it (or any other econ courses) did not inspire me much [a close encounter of the first kind]. After having a master's degree (environmental science) from the same university, I worked for a construction company in Japan as an engineer for six years. Then, I went to the University of Wisconsin at Madison's graduate school, where I re-encountered IO analysis in the Economic Development course taught by Professor Michael Wiseman. When the class discussed IO analysis, I recalled vividly what I learned about it in my undergraduate days and easily inverted matrices [a close encounter of the second kind]. After graduating from Wisconsin with a master's degree, I proceeded to the doctoral program at the University of Illinois at Urbana-Champaign, where I was brainwashed for IO analysis by Professors Geoff Hewings and Michael Sonis [the close encounter of the third kind]. And the rest is history.

2) It was the 1998 conference in New York. It was also my first time visiting New York City from the cornfields of Illinois. Back then, I was quite accustomed to the Midwestern country life, so I didn't enjoy Manhattan because I felt that city life was overwhelmingly busy and expensive. I presented our bi-proportional analysis paper, later a part of my dissertation, and I received a few tough questions about it. The conference was held at New York University, and I attended some workshops on various topics in the evening. Aside from my presentation and evening workshops, I don't remember the conference well, perhaps because I was overly cautious about the surroundings (a stereotypical image of NYC) at that time. My distinct memory related to this conference is that I went to the top of the World Trade Center, despite being acrophobic. I still remember the stunning view of Manhattan from the top. It is a strange and sad feeling that the towers no longer exist.

3) Miyazawa, Ken'ichi. (1976) *Input-Output Analysis and the Structure of Income Distribution.* Springer-Verlag.

This is a well-known book for Miyazawa's extended input-output framework and its applications. Miyazawa's framework is considered the most parsimonious way to extend the standard input-output framework for capturing the effect of income-consumption linkage and interdependence among regions. Whereas more sophisticated and complex models, such as SAM or CGE models, can analyze the effects of a much broader range of economic changes, Miyazawa's framework preserves the simplicity of input-output analysis as one of its advantages. I have employed it in my first publication and a few other publications to this date.

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Faye Duchin – Professor of Economics (emeritus) at Rensselaer Polytechnic Institute (RPI) in Troy, NY (United States)

1) I did not grow up in a scholarly environment, and it is by chance that I majored in psychology as an undergraduate and eventually completed a doctorate in a new field, computer science, in the early 1970s. My first job was at a consulting firm where university faculty occasionally visited. One of them told me that a colleague of his at New York University had an open position at the research center he was building, and my friend thought it would be a great fit for me. That colleague was Wassily Leontief. I was not familiar with input-output economics at the time but was interested by what I heard. I felt some similarity with my dissertation, which studied the implications of rent control in Berkeley, California, where the City Council was contemplating ways to make housing more affordable. I had built a computer model of Berkeley's housing economy to investigate alternative scenarios. Professor Leontief invited me for an interview, I was impressed and fascinated by him, he offered me the job during that visit, and within days I accepted. This was one of the best decisions I have made: I entered an exciting new universe.

I collaborated for 20 years with Professor Leontief, whose advice was "Study the economy, not economics." We co-authored two books in the early 1980s on subjects he had been wanting to study empirically for many years: *Military Spending: Worldwide Implications and Future Outlook*, followed by *The Future Impact of Automation on Workers*. Carrying out these studies created new ways of thinking that inform my research to this day. The 21st century challenges are multiple and overlapping, the explanatory capabilities of our models have substantially expanded over the past half century, and several global input-output databases are now available. What continues to motivate me is to target a strategic contemporary problem, formulate alternative scenarios for addressing the challenges, and expand the model logic to capture the new relationships that are vital for the particular study but at a sufficiently general level to be useful also for a broader range of inquiries.

2) The first IIOA conference I attended was in Innsbruck, Austria, in 1979. I probably made a presentation there but do not recall the details, nor do I remember any of the other talks. Profession Leontief left the department of economics at Harvard in the early 1970s, where he had taught for over forty years and founded the Harvard Economic Research Project in 1948. He left Cambridge, Massachusetts, to move to New York University, where he founded the Institute for Economic Analysis at NYU in 1975. Outside of the formal conference presentations at the Innsbruck conference, Professor Leontief invited me to some informal get-togethers that felt to me like reunions for the researchers and staff at HERP and some of his former students at Harvard. This experience was unforgettable for me in large part because I had not anticipated it. In particular, I met Anne Carter and Karen Polenske for the first time, opening up the way to subsequent dialogue. These encounters were fascinating, and also very motivating.

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Faye Duchin – Professor of Economics (emeritus) at Rensselaer Polytechnic Institute (RPI) in Troy, NY (United States)

3)

Lesthaeghe, R., 2020. The second demographic transition, 1986–2020: sub-replacement fertility and rising cohabitation—a global update. *Genus*, 76(1):1-38.

Dubois, G. et al., 2019. "It starts at home? Climate policies targeting household consumption and behavioral decisions are key to low-carbon futures." *Energy Research & Social Science*, 52:144-158.

Breaking Boundaries: The Science of Our Planet, documentary film with David Attenborough and Johan Rockström (available on Netflix).

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Holiday Acrostics

1954 Insight

November 2022

Michael L Lahr

Each letter in the puzzle appears in two places: once in the grid and once in one of the clue answers, which are listed as a column of words to the right. Work back and forth between the grid and clues to complete the puzzle. The grid contains a quote. The first column of the solution to the clues is the name of the author of the quote and the author's field of interest.

CLUES

- **A.** purchase
- **B.** leading word of eastern I-O association
- **C.** federation like in Europe
- **D.** G's IO software
- **E.** Isle of second intermediate I-O conference
- **F.** calculated somewhat accurately
- **G.** nickname of recently retired RRI Director
- **H.** direct, indirect, or induced
- **I.** nearly (but "no cigar")
- **J.** freeware that is closer to Matlab than R
- **K.** geocode standard
- **L.** converse
- **M.** tourist sites at 2007 conference
- **N.** Leontief's favorite diagonal matrix
- **O.** The C in AC
- **P.** a square matrix of second-order partial derivatives
- **Q.** fund
- **R.** directory separator
- **S.** dissertation
- **T.** extra-regional movement,e.g., freight
- **U.** competitor
- **V.** home of IIOA's conference over a score ago
- **W.** Deaton's nearly
- **X.** expressed via numbers