Newsletter
Number 61, May 2025

INTERNATIONAL INPUT-OUTPUT ASSOCIATION

Welcome from the Editor

Dear **IIOA** member,

I am pleased to announce the release of the latest issue of the *International Input-Output Association Newsletter*. My sincere thanks to everyone who has contributed to this edition as well as previous issues.

In this issue, you'll find some information about recent conferences, the latest ESR articles, some journal highlights, and recent related books.

I warmly welcome your feedback, comments, and suggestions, and encourage you to continue sharing your activities for inclusion in future editions. Thank you for your ongoing support and valuable contributions.

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Would you like to contribute to the IIOA newsletter?
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Conferences

International Conference on Climate Leadership

This conference provides a platform for interdisciplinary dialogue, evidence-sharing, and collaboration among scholars, policymakers, and practitioners. We seek to explore how climate leadership is exercised across different scales and sectors, and how diverse actors can work together to accelerate progress toward net-zero emissions, climate resilience, and sustainable development.

Climate leadership has become a defining feature of the global response to the climate crisis. With the escalating urgency of climate change, there is a growing need for visionary leadership across governments, industries, cities, communities, and individuals. Effective climate leadership enables the formulation and implementation of ambitious policies, drives innovation, mobilises finance, and ensures inclusive and just transitions towards a sustainable future. The International Conference on Climate Leadership will be held on 21-22 July 2025 at Harbin, China. This conference provides a platform for interdisciplinary dialogue, evidence-sharing, and collaboration among scholars, policymakers, and practitioners. We seek to explore how climate leadership is exercised across different scales and sectors, and how diverse actors can work together to accelerate progress toward net-zero emissions, climate resilience, and sustainable development. Contributions from a wide range of disciplines—including economics, policy studies, engineering, management, and environmental sciences—are welcome.

We invite submissions that address, but are not limited to, the following sub-themes:

- National and regional climate governance
- Corporate climate strategies and leadership
- Climate finance and investment
- Low-carbon technologies and innovation
- Deep decarbonisation of key sectors
- Urban climate action and sustainable infrastructure
- Climate change adaptation and resilience
- International climate cooperation
- Just transitions and social inclusion
- Behavioural change and public engagement
- Climate leadership in emerging and developing economies

Conference Chairs

Prof. Tao Ma, Dean of the School of Business, Harbin Institute of Technology

Prof. Zhifu Mi, Director of Research of Bartlett School of Sustainable Development, University College London

Keynote Speakers

To be confirmed

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Conferences

Awards
Best Paper Awards will be announced at the conference. Awardees will receive a certificate in recognition of their contribution.

Submission Guidelines
Please send your extended abstracts to Dr. Wang via email at 2025climateleadership@gmail.com
Submissions should include:
Title, extended abstract (less than 1,500 words), and 3–5 keywords
Author names and institutional affiliations
Contact information for the presenting author

Key Dates
Submissions open: 15 April 2025
Submissions close: 15 June 2025
Acceptance notification: 20 June 2025
Registration and payment closed: 14 July 2025
Conference: 21–22 July 2025

Registration Fees
There is NO registration fee for the conference. Lunches will be provided during the conference period. Participants are responsible for their own travel, accommodation, and other personal expenses.

Visa Information
For participants who require a visa to attend the conference, the local organising team will provide an invitation letter upon request. Please contact the organisers well in advance to allow sufficient time for visa application and processing.

Enquiries
For any questions, please contact the local organising team via email at 2025climateleadership@gmail.com.

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The 10th Permanent SHAIO Workshop

Dear colleagues,

We are pleased to invite you to participate in the **10th Permanent Workshop** of the Hispano-American Input-Output Society (SHAIO), which will take place in **September 2025 in the city of Palma de Mallorca**.

This event has two main objectives. First, it aims to highlight the work done by young SHAIO researchers. These works will be evaluated, commented on, and enriched through feedback from senior researchers acting as discussants. Second, it again emphasises strengthening relationships with Statistical Institutes, recognising their key role as a source of data, knowledge, and technical support for research. These institutions provide the foundation for our investigations and are strategic allies in generating and analysing quality information.

The official languages of the event are Spanish and English, and abstracts and papers may be submitted in either language.

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We are confident that the warm welcome for which our islands are known will make this upcoming gathering the perfect setting to share and discuss our latest work. This 10th edition is yet another testament to the growth and consolidation of these workshops, which have continuously provided us with the opportunity to collaborate on the most important topics in our research agenda.

We look forward to welcoming you in Palma de Mallorca.

Abstract submission	May 1, 2025
Notification of acceptance	May 15, 2025
Full paper submission	June 15, 2025
Registration deadline	July 1, 2025
Workshop	September 4-5, 2025

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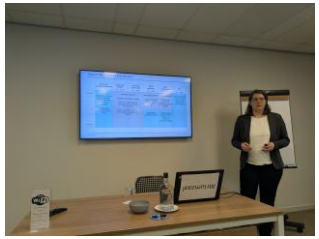
Successful Conclusion of the 16th Input-Output Workshop in Groningen

From March 26 to 27, 2025, the Input-Output Workshop took place in Groningen at the University of Groningen. The workshop, which has always taken place in Germany in the past and is organized by a team from GWS, Bochum University of Applied Sciences and the University of Bremen, went on tour for the first time and was hosted by Groningen this year. Together with Erik Dietzenbacher and his team, it was possible to put together a challenging program on various topics related to the world of input-output analysis thanks to numerous great participants. The workshop culminated with Klaus Hubacek's keynote speech on “Modeling Global Carbon Inequality along global value chains”. We have received more than 70 abstracts for consideration, the final program listed 52 presentations, and we had nearly 80 participants. For those interested, the full program and some of the presentations can be viewed on the workshop website (https://www.gws-os.com/de/konferenzen/i-o-workshop/input-output-workshop-2025). We would like to thank all participants for their contribution to making this workshop a success. We are already looking forward to the next workshop in 2026. Time and space will be announced later this year.

The organization team:
Anke Mönnig (GWS)
Tobias Kronenberg (Bochum University of Applied Sciences)
Susanna Bolz, Philip Kerner (University of Bremen)
Erik Dietzenbacher (University of Groningen)



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

Economic Systems Research

Journal of the IIOA

Volume 37, Issue 1, 2025

Guomei Zhao, Rui Xie, Bin Su & Qunwei Wang

CO2 terms of trade and its determinants based on input–output models with technical differences

This paper constructs a comparative analysis framework on how the input-output (IO) model with technical differences affects the calculation of the pollution terms of trade (PTT) and the tests of the pollution haven hypothesis. Specifically, the CO2 terms of trade (CTT) of the world's major economies are calculated based on five IO models, and chain additive structure decomposition analysis (SDA) is conducted to examine the roles of different factors in the changes in CTT. The economic phenomena reflected by the CTT measured by these IO models are found to be different, and a comparative analysis shows that different IO models are suitable for studying different economic problems. Suggestions are provided on the application of different IO models in the calculation of economic indicators and the study of economic issues. Policy makers need to be cautious about policy recommendations based on the results obtained from different IO models.

Fátima Cardoso & António Rua

Gone with the wind: a structural decomposition of carbon emissions in Portugal

Understanding the driving forces underlying greenhouse gas emissions is vital for the design of climate and environmental policies aimed at promoting sustainable development and human well-being. In particular, we focus on Portugal where a striking reduction of carbon emissions has been observed in just a few years. We perform a structural decomposition analysis over the last two decades allowing to unveil the main drivers underlying the evolution of carbon emissions. We find that the investment on renewable energy sources, namely wind, has been key for a successful transition to a cleaner economy. The impact has been felt both on the reduction of carbon intensity as well as on the increase of energy efficiency in power generation. We also find that such benign evolution was partly counterbalanced by the increase of the contribution of final demand to carbon emissions despite being attenuated with the COVID-19 pandemic.

Cristian Mardones & Matías Correa

Methodological proposal to approximate the sectoral impacts of a carbon tax at the regional level – the case of Chile

This study proposes a methodological approach to approximate the sectoral impacts of carbon taxes in the different regions of Chile through the environmental extension of intraregional input – output models. These models are calibrated by regionalizing technical coefficients using an indirect method called Industry-Specific Flegg Location Quotient. Carbon dioxide emissions at the regional and sectoral levels are obtained mainly from regional inventories of greenhouse gases, although in some sectors, they are calculated indirectly from fuel consumption. Then, tax scenarios are proposed that allow simulation of the effects on sectoral prices, levels of production, and emissions at the regional level. The results show that implementing an identical tax rate at the national level has a very heterogeneous impact on the country's regions, with the regions of Atacama, Antofagasta, Valparaíso, and Biobío being the most affected economies in relative terms since most of the large thermoelectric power plants are located there.

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Kehan He, D'Maris Coffman, Xingzhe Hou, Jinkai Li & Zhifu Mi

An electricity big data application to reveal the chronological linkages between industries

Effective integration and compromise between theories and empirical data are essential for an operational economic model. However, existing economic models often neglect the intricate fluctuations and transitions that occur in weeks and days. This research proposes an Input–Output-based algorithm to introduce the time domain into economic modelling. Using daily electricity consumption big data in Chongqing as a proxy for economic activities, we quantitatively analyse the chronological interactions among industrial sectors and reveal that a longer duration is required by the heavy industry sector to signal an intermediate production in the service sector than any other sectors in this municipality. With the proposed model, we forecast the economic impact induced by demand changes for consumer goods under three growth scenarios. The model not only serves as a methodological bridge between theoretical and data-driven approaches but also offers new insights into the dynamic interplay of sectoral activities over time.

Cheng Yongwei

Spread efficiency of energy demand in the industrial chain: a perspective from economic distance

This paper investigates the spread efficiency of energy demand in the industrial chain based on the input-output method. The concept of intersectoral economic distance and spread efficiency was introduced to formulate the energy demand spread functions. Then, an empirical study was conducted based on China's 2017 input-output data and nearly 3,500 companies were listed in the Chinese A-share market. The results show that the sectoral average spread time is 32.75 days. Manufacturing plays a central role in the spread of energy demand. In the short term, the logistics sector has the greatest pulling effect on energy demand, while the electric power sector has the greatest impact on energy demand in the long term. Energy demand caused by exports is greater than consumption and investment. Finally, sectoral economic distances and actual spread functions for 9 main energy sources are provided to help us better predict energy demand.

Federico Riccio, Giovanni Dosi & Maria Enrica Virgillito

Functional specialisation and income distribution along global value chains

This paper addresses two questions: first, the extent to which the participation in Global Value Chains (GVCs) has penalised labour as a globally insourced production input, and second, what happened to between-occupation functional inequality. We combine input–output (I–O) tables and labour income along the production stages of global value chains. We focus on foreign labour requirements in manufacturing industries and distinguish across four production stages, namely fabrication, marketing, R&D, and managerial functions, to map the relative specialisation patterns of different production sub-systems. Our results show that GVCs are hierarchically structured, with advanced countries specialising in upstream functions along global production networks. Fabrication workers are the largest losers in this process, accounting for most of the drop in labour share in advanced and developing countries. Considering that production workers make up more than 50% of the workforce in both advanced and developing countries, the loss of the labour share of blue-collar workers has contributed to increasing wage inequality globally.

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Prithu Sharma & Aparna Sawhney

Understanding export-generated employment in India

International trade can play a catalytic role in economic development and employment enhancement. To understand the employment impact of India's pattern of trade, we use a structural decomposition analysis utilising the World Input – Output Database. Distinguishing between final and intermediate exports from India, we quantify the domestic employment effect during 2000–14. We show that a shift in final exports' composition towards sectors and sub-sectors with lower employment generation potential led to a negative employment effect. However, changes in international production sharing have largely had a positive impact on employment in India. Our structural decomposition analysis is complemented with a panel regression that tracks the employment effect of exports through backward linkages. We find significant differential impacts in India's bilateral trade with middle-income versus high-income countries. While bilateral backward linkages from exports to middle-income countries enhanced employment in India, exports to high-income countries did not yield a positive employment effect.

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Latest ESR articles

Economic Systems Research

Journal of the IIOA

Latest articles (up to 15 Apr)

Eva Alonso-Epelde, María Victoría Román de Lara, María Moyano-Reina, Xaquín García-Muros, Manuel Tomás, Mikel González-Eguino & Iñaki Arto

Balancing the scales: gendered impacts and policy responses to oil price shocks in Spain

This paper analyses Spanish households' vulnerability to oil price shocks from a gender perspective and explores different compensatory policies to reduce it. The methodological approach combines an input–output price model and a microsimulation model based on the Household Budget Survey. The paper studies the impacts of the recent surge in oil prices using four scenarios based on different alleviation measures (discounts on fuels, subsidies for public transport, and a combination of the two). Gender implications are analyzed considering the gender of the household reference person and the household feminization degree. The results show that oil price shocks have a more significant impact on those households with greater mobility needs, dependence on private transport, and less accessibility to public transport. Among the policy responses, subsidizing public transport would be the most effective policy from an economic point of view and the fairest from a gender and social justice perspective.

Harry C. Wilting & Daan in 't Veld

An overview of accounting approaches for national greenhouse gas emissions; comparing consumption and production footprints in the European Union

Environmentally extended multi-regional input–output (EEMRIO) analysis enables emission accounting over supply chains starting from production-based emissions reported by countries. In addition to well-known approaches that base the accounting on a country's final demand, this article proposes a production footprint that includes all direct and upstream emissions from a country's production activities. We applied various accounting approaches to greenhouse gas (GHG) emissions related to consumption and production in all 27 EU Member States. Our results showed that production footprints exceeded consumption footprints in all Member States, except France, Italy and Croatia. Consumption and production footprints identified different sectors as main contributors to total emissions per country. An analysis that focuses only on consumption footprints, disregarding production footprints, misses up to 69% of a country's total import-related GHG emissions. We recommend that policymakers consider both consumption and production footprints together with production-based emissions, as this may lead to different reduction opportunities.

Eduardo Rodrigues Sanguinet, Patricia Batistella, Fernanda Castilhos França de Vasconcellos, Adelar Fochezatto & Augusto Mussi Alvim

The gendered content of trade: regional impacts in a constrained economic scenario for Brazil and Chile

Input–output constrained disturbances significantly impacted the gender gap in the labour market. In Brazil and Chile, women experienced greater relative job and income losses during economic shocks, such as the COVID-19 pandemic, due to structural factors like gender and regional inequality, as well as the high concentration of women in the services sector, which was particularly affected by input–output linkages between core and peripheral economic areas. This paper examines the direct and indirect impacts of economic constraints on regional production systems, focusing on gendered labour footprints, income-based multipliers, and industry-level analysis. It estimates the gender-based labour content of trade in interregional and export markets, considering the economic challenges brought about by the COVID-19 pandemic. The findings suggest that value-added generated by female workers were more affected in areas specialising in natural resources and services industries, with economic constraints likely propagating the gender gap along supply chains.

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Hyoungmin Han & Sunhyung Lee
Global value chains and disasters

We assess the disruptive potential of disasters on global value chains (GVCs) using comprehensive data on GVC trade and disasters. Analyzing 62 countries from 2007 to 2020, we find that a typical disaster reduces forward and backward linkages by at least 27% on average. Our analysis uncovers that more prolonged and intense disasters further weaken GVC linkages, with climate-related disasters being the most disruptive due to their severity and frequency. We also reveal how the positions of developing countries in GVC linkages and inadequate responses amplify these effects. Finally, we discuss policy implications for building a more resilient global production network.

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Highlights in journals

ELuciano Ferreira Gabriel, Luiz Carlos de Santana Ribeiro & José Firmino Sousa Filho
Structural change and productive interdependence: An analysis for Brazil
Structural Change and Economic Dynamics

This paper aims to analyze Brazil's multisectoral productive interdependence and structural change by applying input-output methods and panel data estimations. The main findings suggest a reduced inter-sectoral convergence process in terms of growing service-manufacturing linkages. Manufacturing is losing multiplier intensity and importance compared to services. Most of the total output change in Brazil is due to changes in final demand, not technological change. Furthermore, structural change and interdependence between services and manufacturing do not suggest a growth-enhancing pattern.

Ling Tang, Junai Yang, Jiali Zheng, Xinlu Sun, Lu Cheng, Kehan He, Ling Li, Jinkai Li, Wenjia Cai, Shouyang Wang, Paul Drummond & Zhifu Mi
Assessing the impacts of fertility and retirement policies on China's carbon emissions
Nature Climate Change

The gradual adjustment of fertility and retirement policies in China has social benefits in terms of coping with population aging. However, the environmental consequences of these policies remain ambiguous. Here we compile environmentally extended multiregional input–output tables to estimate household carbon footprints for different population age groups in China. Subsequently, we estimate the age-sex-specific population under different fertility policies up to 2060 and assess the impacts of fertility and retirement policies on household carbon footprints. We find that Chinese young people have relatively higher household carbon footprints than their older counterparts due to differences in income by age group. Relaxing fertility policies and delaying retirement age are associated with an increase in population (and labour supply) and thus increases in household carbon footprints, with the majority of these increases from the fertility side. These results may help policymakers understand interactions among those measures targeting population aging and climate action.

Edgar Towa, Albert Kwame Osei-Owusu & Livia Cabernard
Tracking Africa's trajectory toward sustainability: An assessment of environmental and socioeconomic impacts
Sustainable Production and Consumption

African countries face heightened vulnerability to climate change and socioeconomic issues. Understanding production, consumption, and trade impacts is crucial for enhancing Africa's environmental resilience and social prosperity. This study uses multiregional input-output analysis to assess the environmental (biodiversity loss, climate change, particulate matter, water stress) and socioeconomic (employment, value-added) impacts across 51 African countries from 1995 to 2022. The study finds that Africa contributes disproportionately to global environmental impacts relative to its gross domestic product (GDP). From production and consumption perspectives, Africa accounts for over 13 % of the global biodiversity loss, particulate matter, and water stress impacts, generating only 3 % of the global value added. Between 1995 and 2022, absolute impacts increased alongside population and GDP, while per capita impacts and intensity decreased. Eastern Africa ranks highest in biodiversity loss (Madagascar), climate change (Kenya), and particulate matter (Ethiopia); Western Africa (Nigeria) leads in employment; and Northern Africa (Egypt) in water stress and value-added. The impacts embodied in Africa's trade with the rest of the world exceed those related to intra-African trade. African regions exhibit notably higher impact intensities than importing regions. The study recommends targeted sustainable development policies for Africa, advocating for shifting supply chains to alleviate environmental and social burdens through responsible sourcing practices, both regionally and by importing nations.

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Ferran Sancho
The rate of surplus value and the structure of the tax system
Bulletin of Political Economy

We outline a procedure to approximate the rate of surplus value, as precisely defined by Morishima, using disaggregated data published by statistical agencies such as input-output tables and their SAM extensions. Additionally, we develop an accounting method to connect the rate of surplus value to policy variables, particularly taxation. Our multisectoral calculations reveal that taxes affect the rate of surplus value differently. Based on these findings, we propose that the rate of surplus value could/should be adopted as a key indicator for tax policy evaluation in multisectoral models such as input-output, SAM or CGE models.

George Economakis & Maria Markaki
The Economic Pyramid of Unequal Exchange within the European Union
World Review of Political Economy

In this article, the "mechanism" of unequal exchange, on the basis of Marx's analysis and Emmanuel's seminal contribution to the issue, is investigated. According to the analysis, the deeper cause of unequal exchange lies in the established differences in the labor skills between more and less advanced countries. The analysis reveals that behind the Ricardian "comparative advantage," unequal exchange is hidden at the expense of the less advanced countries of lower wages. On the basis of the theoretical framework of the study, an empirical investigation of unequal exchange within the 27 countries of the European Union (EU27) is developed. According to the findings of this study, there is an economic pyramid of value extraction (unequal exchange) within the EU27. At the top of this, there are countries that extract value from other EU27 countries in the context of intra-EU27 trade and at the same time exhibit monetary surpluses in their trade balance. At the bottom of the economic pyramid, there are countries that experience value extraction from other EU27 countries in the context of intra-EU27 trade while they may run monetary surpluses or deficits in their trade balance.

Maria Markaki & Stelios Papadakis
Productive Structure Optimization under Macroeconomic Constraints based on Input-Output Analysis
Structural Change and Economic Dynamics

The term productive restructuring refers to the transformation of an economic system for reaching predefined economic and social goals. The aim of this paper is to develop a methodological framework of productive restructuring, based on input-output analysis, targeting the optimization of the productive structure of an economy. The process of the productive restructuring involves: firstly, the reallocation of production among different economic sectors and, secondly, a process of intermediate input substitution. The proposed optimization model aims at the maximization of the total employment under macroeconomic constraints. A Particle Swarm Optimization algorithm is employed for the solution of the optimization problem. The proposed methodology is applied to the Greek economy. Results appear to show that the productive restructuring should focus on manufacturing sectors, mainly those of high and medium-high technological level. The findings of the research suggest that industrial structure adjustments have great potential for policy development.

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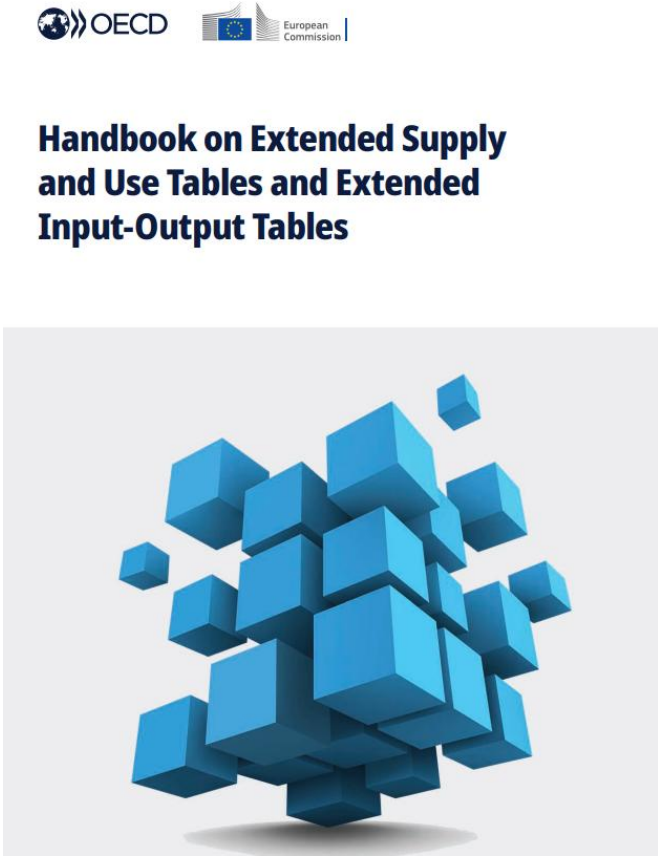
Recent I-O Books and related

Handbook on extended supply and use tables and extended input-output tables

The OECD Statistics and Data Directorate and the European Commission's Joint Research Centre have published a new handbook designed to bridge the gap between macroeconomic statistics (such as GDP and employment) and microeconomic data (such as trade and business statistics). The handbook focuses on extended supply and use tables and extended input-output tables. These extended tables are similar to the regular tables; the extension is that industries are split by enterprise characteristics. For example, an extended input-output table could distinguish between metal manufacturing by small and medium-sized enterprises (SMEs) and by large enterprises.

This enhanced granularity responds to demands from policymakers for more granular detailed. They seek insights into the role of SMEs, multinational enterprises (MNEs), and exporters in the economy, and how these types of enterprises relate macroeconomic indicators like GDP and employment. They also want to understand the domestic and international relations/dependencies between different types of enterprises. For instance, how much of GDP is generated by exporters, are foreign-owned MNEs operating as “stand-alone” entities, or are they closely linked to domestic SMEs, to what extent are SMEs exposed to developments in the EU, U.S., China and other foreign markets — either directly through direct trade or indirectly through supply chains?



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The handbook guides users in identifying which dimensions of granularity are most relevant for their country. It explains the rationale, background, and data sources for key extensions of SUTs and IOTs, namely by size class (SME/large), ownership (foreign/domestic), and trading status (exporters/non-exporters). Subsequently, it provides practical, step-by-step guidance for compiling these data, both with and without access to enterprise-level information. Further, the handbook shows how to extend these data for global value chain analysis. It explains how to communicate results to non-experts and highlights applications by statistical offices, international organisations, and researchers in areas like employment, productivity, material use, and emissions.

This publication draws on the work of the OECD expert group on extended supply and use tables and is authored by statisticians and economists. It combines best practices with hands-on advice based on experiences from countries around the world. The handbook is freely available at https://joint-research-centre.ec.europa.eu/projects-and-activities/trade-and-industrial-policy-analysis/input-output-accounts/handbook-extended-supply-and-use-tables-and-extended-input-output-tables_en and https://www.oecd.org/en/publications/handbook-on-extended-supply-and-use-tables-and-extended-input-output-tables_e9fdcf85-en.html

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