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# REGIONAL INPUT-OUTPUT STUDIES: A SYSTEMATIC LITERATURE REVIEW

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## Abstract

The purpose of the paper is to provide a systematic insight into the state of the art in the regional (sub-national) input-output analyses. Large and growing body of scientific literature in the field is very diverse, fragmented and challenging to comprehend mostly because it is usually published as articles, not only in the field specific journals, but also sporadically in other journals. On the other hand sub-national (regional) level of the analysis is not very frequent. However, articles concerning this level are not easy to identify in a bunch of literature because the term 'regional' can refer to various spatial levels (country, continent, group of countries, sub-national entities). Therefore, there is a need for up-to-date and comprehensive meta-analysis of the work done so far in the area of regional (sub-national) input-output analyses. The present systematic review is based on a broad search of two databases of scientific publications: Web of Science and SCOPUS. In this research we apply a Qualitative Data Analysis (QDA) approach and conduct a content-coding of selected papers.

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## 1. Introduction

Input-Output studies follow a holistic approach to economic analyses, and thus may provide a crucial insight for policymakers. Focus on flows, and not on a static picture, allows to build future projections and to trace the impact of different activities. But the robustness of this method does not go without a price – and this is the significant data requirements. It is thus especially challenging to build reliable regionalized input-output tables. However, the number of such studies are growing, reflecting the increasing importance of going beyond the national level in spatial economic analysis. We focus mainly on input-output applications at a sub-national level, as growing discretion of regional public authorities and significance of place-based policies highlight the need to provide policymakers with a robust and regionalized evidence and also as a comprehensive database for spatial Computable General Equilibrium models.

## 2. Research objective

The purpose of the present paper is to provide a systematic insight into the state of the art in the regional (sub-national / interregional) input-output analyses. Large and growing body of

scientific literature in the field is very diverse, fragmented and challenging to comprehend mostly because it is usually published as articles, not only in the field specific journals, but also sporadically in other journals. On the other hand sub-national (regional) level of the analysis is not very frequent, especially in certain parts of world like Eastern Europe. However, articles concerning this level are not easy to identify in a bunch of literature because the term 'regional' refers both to sub-national and continental (group of countries) spatial levels. Therefore, we would argue that there is a need for up-to-date and comprehensive meta-analysis of the work done so far in the area of regional (sub-national) input-output analyses, including identification of methods and techniques used the most and the least frequently, data sources and issues, types of articles (methodology oriented vs case studies), topics of analyses (environmental flows, economic flows, etc.), to name only a few. Based on systematic literature review the promising future research avenues can be identified in the work on regional (spatial) methods of modelling.

## 3. Specificity of interregional input-output analysis

Creating regional input-output tables – where regions are territories within a country – is more challenging than creating multi-regional IOs – where regions are countries or groups of countries. It also faces different challenges than creating of national IOs. First, the most reliable methods of creation for National IOs is national-wide survey. Due to the high costs, usually it done by National Statistical Offices. Multi-regional IOs usually start with the existing national IOs while interregional IOs rarely are available from statistical offices so mostly they are created by researchers themselves. Table 1 summarizes most important differences.

**Table 1.** Search queries used for the collection of documents for review

| | **National IOs** | **Multi-regional IOs** | **Interregional IOs** |
|---|---|---|---|
| **Method of creation** | Survey - usually carried out by National Statistical Office | National IOs from various sources: GTAP, EUROSTAT, National Statistical Offices | The whole bunch of approaches that are under our investigation, and which generally can be grouped as: bottom-up, top-down and hybrid |
| **Type of creator** | National Statistical Office or other public entity | Researchers | Statistical offices or Researchers |
| **Treatment of trade** | International trade only | Regional trade = international trade between the countries in question<br>International trade = foreign trade but between the selected countries and the rest of the word | Regional trade = interregional trade matrix or national pool<br>International trade = matrix or pool |
| **Source of information on trade** | International trade statistics | International trade statistics | Ample amount of methods which are under our interest:<br>- Transports flows,<br>- Physical Input-Output Tables<br>- Gravity Model<br>- Entropy Maximisation<br>- Mathematical programming, etc. |

Source: own study.

The main feature which makes the creation of regional IO tables special and difficult is the issue of trade. At the national level, the trade statistics are easily available since the flows of national goods and services are registered among the countries. At the multiregional level, both regional and international trade is on the country level so the statistics are available for the trade among the countries in question and the rest of the world. However, it is totally different story for the regional IOs where the units are lower than the country level. For them, interregional trade is not registered and international trade is biased, hence it is a challenge to find a way to estimate both of them.

As for international trade of the regions, the statistics are biased firstly, because usually the main ports are in the statistics presented as the biggest exporters/ importers (since it is the first destination of the foreign products) and the rest of the regions show underestimated trade. Secondly, international trade is often registered based on the location of importer/exporter's company. This often happens to be in the capital city or other big cities so the statistics show that capital region seems to be the biggest importer/exporter even if it is not the final destination for the products, as they flow further into other regions.

As for interregional level, it is not registered so over the years many methods were developed and advanced in order to grasped properly the trade among the regions themselves. This paper shows those different approaches and their evolution.

The main ambition of this paper then is present a comprehensive and rigorous overview of the methods used for creating regional IO tables, in order to give a ground for further scientific investigations within regional studies and science on their creation, since they proved a very useful for spatial analyses of various subjects (from agricultural to migration policies). It is worth stressing that they are used in many ways. First, as a ready tool for analyses of intermediate and final demand relationships of the regions. Second as a provider of input and output parameters for further production studies (e.g. econometric production analyses). Third, they are used as a main database in the input-output models and last but not least they are the basis for Computable General Equilibrium models. Hence, the provision of research based and reliable method of creating regional IO tables could encourage even Statistical Offices to publish such data, which would certainly increase the number of analyses in regional studies and practical use (e.g. evaluations of regional policies).

## 4. Methodology and data

The method applied in the exercise is a systematic literature review that involves organized data collection and content analysis. Our approach is inspired by the systematic literature reviews in the field of inter-organizational networks done by Provan, Fish, Sydow (2007) and Bergenholtz and Waldstrøm (2011).

The present systematic review is based on a broad search of two databases of scientific publications: Web of Science (WoS) and SCOPUS. The databases were searched on 3rd January 2014, therefore only articles published (included in the databases) up to this date are included in the analysis. Drawing on a set of preliminary queries, we decided to search for papers that refer in their titles, abstracts or keywords to notions of "input-output" and "table" and "region" (cf. Table 2).

**Table 2.** Search queries used for the collection of documents for review

| WoS query | Number of papers | Scopus query | Number of papers |
|---|---|---|---|
| (TS=(Input-output table* region*) OR TS=(Inputoutput table* region*) OR TS=(Input-output table* interregion*) OR TS=(Inputoutput table* interregion*) OR TS=(Input-output table* inter-region*) OR TS=(Inputoutput table* inter-region*) OR TS=(Input-output table* multiregion*) OR TS=(Inputoutput table* multiregion*) OR TS=(Input-output table* multi-region*) OR TS=(Inputoutput table* multi-region*) OR TS=(Input-output table* multi region*) OR TS=(Inputoutput table* multi region*)) | 175 | TITLE-ABS-KEY(input-output AND table* AND region*) OR TITLE-ABS-KEY(inputoutput AND table*and region*) OR TITLE-ABS-KEY(input-output AND table* AND interregion*) OR TITLE-ABS-KEY(inputoutput AND table*and interregion*) OR TITLE-ABS-KEY(input-output AND table* AND inter-region*) OR TITLE-ABS-KEY(inputoutput AND table*and inter-region*) OR TITLE-ABS-KEY(input-output AND table* AND multiregion*) OR TITLE-ABS-KEY(inputoutput AND table*and multiregion*) OR TITLE-ABS-KEY(input-output AND table* AND multi-region*) OR TITLE-ABS-KEY(inputoutput AND table*and multi-region*) OR TITLE-ABS-KEY(input-output AND table* AND multi region*) OR TITLE-ABS-KEY(inputoutput AND table*and multi region*) | 285 |

Source: own study.

As a result we identified 175 articles in Web of Science and 285 in SCOPUS. 110 papers was present in both databases. The number of unique titles was 346. After removing duplicates, irrelevant papers and articles in language other than English we received a dataset of 285 papers. This set has constituted a base for a further content review of spatial level of papers. 5 spatial levels has been distinguished, of which 3 has been of sub-national nature. Selected spatial levels are:

- Supranational (group of countries or continent)
- National (country – sovereign political entity)
- Regional (sub-national entity)
    - All regions within a country (interregional)
    - One region within a country
    - Other (two regions, but not all; etc.)

Content coding allowed to group papers into spatial level categories. Only 42 papers turned out to concern all regions within a country, i.e. the level of analysis that is of main interest of the present study. 29 papers dealt with supranational level and 48 with national level (country or countries). 92 papers concerned one region within a country, and 34 felt under the category of “regional other”. The remaining part of the article is based on the analysis of 42 papers directly dealing with all regions within a country (for the detail list of the articles please go to the Table 4 placed at the end of the paper).

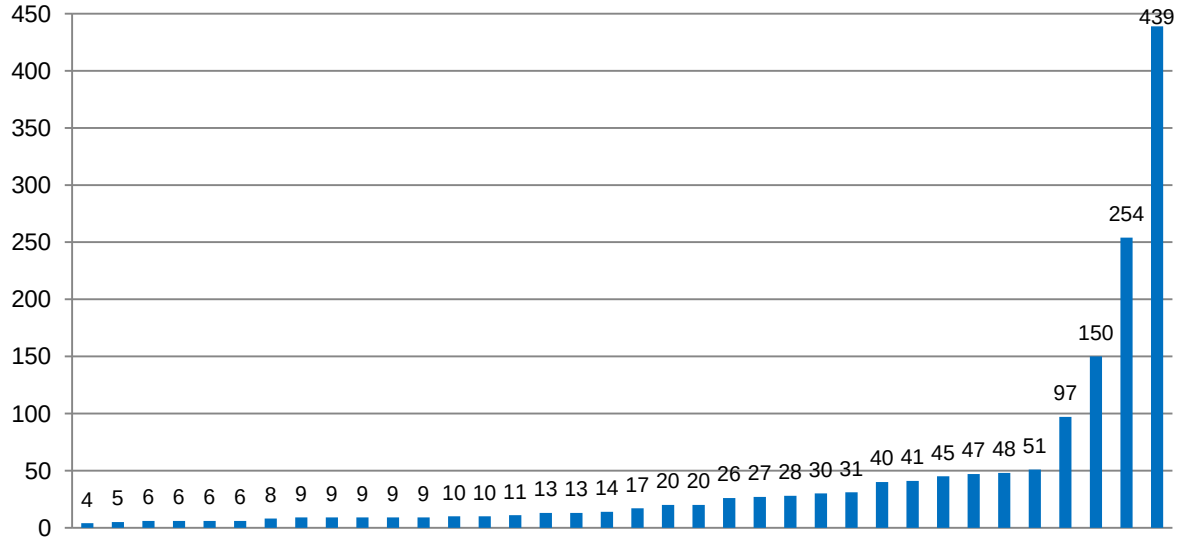
# 5. Results

## 5.1. Territorial scope

Out of 42 analysed articles almost all (37) had clearly defined spatial scope of the empirical analysis, i.e. territorial units for which regional Input-Output tables were analysed. In almost all articles these were administrative regions, but in a few cases different kind of territories were analysed (e.g. single-seat electoral districts or labour market regions). The number of analysed regions was very diversified (Figure 1). It ranged from 4 to 439, but in most of the articles (27) it didn't exceeded 35. Although the number of regions doesn't seem to be a methodological limitation, usually, due to the availability of data (incl. Input-output tables), researchers decided to analyse territorial units at higher administrative level (usually regions, very rarely subregions). There was also visible, although not very strong tendency that articles analysing larger sets of regions (over 50) were published later i.e. after 2001. Earlier articles, probably due to limited analysing tools (software and hardware), studied smaller number of regions (usually no more than 10).

The highest number of articles using input-output tables at sub-national level refer to Asian (15) and European (9) countries. Other continents, represented in smaller scale, are North and South America (respectively 6 and 1) and Australia (5). Popularity of Asian direction is a result of high number of articles describing studies on Chinese (7 articles) and Japanese regions (6 articles), and, to a smaller extent, Indonesia (2 articles). Relatively popular subject of research are USA regions (not always states) analysed in 5 articles , and Australia (4 articles). The most diversified from the geographical point of view were articles describing studies using European input-output data. This group included two Western Europe countries analysed in two articles (Germany, Spain) and few countries subjected by one article (France, Israel, Netherlands, Finland, Italy). It is also worth to mention about the two articles (Benfiglio, Chelli, 2008; Hewings et al., 1989) that analysed hypothetical countries and their regions, i.e. not existing, theoretical constructs.

**Figure 1.** Number of territorial units analysed in articles using input-output tables at sub-national level.

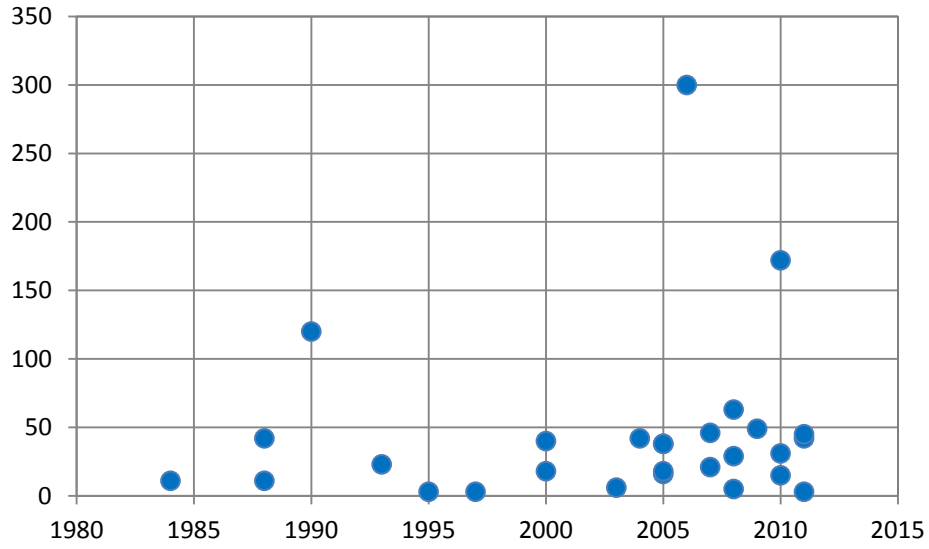



Source: own study.

## 5.2. Sectors analyzed

Reviewed articles were very diversified not only in terms of the number of analysed regions but also sectors in the regional input-output tables. This value ranged from 3 to 300, but only in 7 out of 34 cases exceeded 50. At the same time also the number of articles analysing tables with less than 10 sectors was relatively small (5). Interestingly the number of sectors describing regional input-output tables from the same country and based on tables published by national statistical institutions was also diversified, e.g. articles about China analysed tables with the number of sectors ranged from 5 to 73. Similarly as with the number of regions, also in terms of number of sector some chronological regularities were visible. All articles describing tables with more than 50 sectors were published after 2001 (Figure 2). This can be explained by increasing computable capabilities of software and hardware analysing tools available for the researchers. This factor is extremely important in econometric modelling and have a direct impact on usefulness of the tables for regional policy analysis (Wittwer, Horridge, 2010).

**Figure 2.** Articles by the number of sectors in I-O table and year of publication




Source: own study.

## 5.3. Data sources

The most basic issue in analysis of input-output tables at sub-national level is how to obtain regional tables. Almost all analysed articles (34 from 42) contained more or less detailed information about this procedure. In more than half of the cases (18) the source of the regional input-output tables were national or regional statistical bureaus or offices. This source of data was available only for countries in which statistical institutions prepare (not necessary regularly) this kind of sub-national tables, like Australia, China, France, Finland or Japan.

If regional input-output tables aren't available from the statistical service institutions they have to be created through statistical procedures. At the beginning of or research we assumed that we will be able to distinguish three main methodological paths of creating regional input-output tables: bottom-up methods, basing on regional surveys; top-down approach, regionalizing national input-output tables with use of data from regional accounts;

and a hybrid method, using both approaches (survey and estimation). Detailed analysis of the articles about input-output tables at sub-national revealed that only first two approaches were used in practice, while mixed method was very rare (it occurred only once). Estimations, so top-down methods (8 articles), were much more popular than surveys, most probably because the latter are significantly more expensive and time consuming. On the other hand, top-down approach require collecting large amount of detailed data at regional level that usually are less available than national data (Wittwer, Horidge, 2010). In only 4 articles regional input-output tables were obtained through survey methods. In 3 other cases survey and non-survey methods were used, but not to construct the same table (as in the hybrid approach) but to create separate tables.

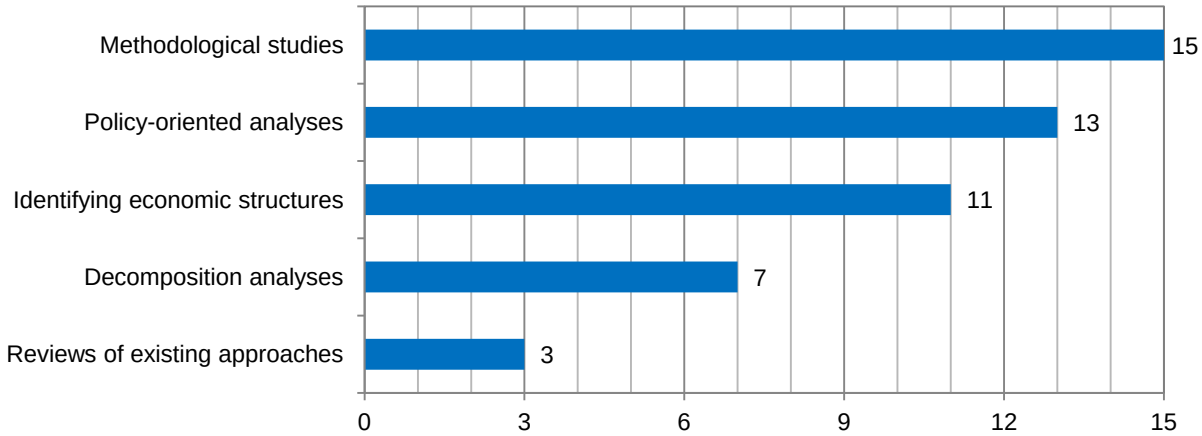
From the chronological point of view there was a tendency to use top-down approach more often in older articles. In papers published in the last 10 years the most common source of regional input-output tables were statistical institutions.

## 5.4. Themes and approaches

In this section, we focus on the content of the reviewed articles. First, we build a typology of main types of research aims. Secondly, we assess the main themes considered in the analysed papers, and propose a short list of those appearing most often.

Regarding the research questions, we distinguished five broad types of approaches, i.e. (1) predominantly methodological studies, (2) policy-oriented analyses, (3) studies targeted at identifying economic structures, (4) decomposition analyses, and (5) reviews of IOA developments The Figure 3 present the number of articles falling into each category. These categories are not mutually exclusive, as some studies may combine two distinct research questions. However, the proposed typology provides a feasible and comprehensive framework for a more structured and in-depth review of the field. In the following part of this paper, we briefly describe each of the five groups.

**Figure 3.** Number of articles according to the five types of research queries




Source: own study.

Methodological articles are the most common type found in our database – there are 15 papers of this kind. The main focus of methodological studies are estimation methods, especially those used in non-survey and hybrid IOTs. Studies in this group are either

comparing existing methods or devising new approaches/adjustments. In the former case, the validity and reliability of the examined methods are verified, but also their feasibility regarding e.g. the cost of data collection. In most instances, the methods concerned are applied to real situations and data, but sometimes hypothetical regions and artificially created data are used instead (McCann and Dewhurst 1998, Bonfiglio and Chelli 2008).

Policy-oriented studies are the second most common type – we identified 13 papers of this kind. Majority of these articles evaluates impacts of different endo- and exogenous changes on regional economies, while the remainder explores linkages and relations between various phenomena in order to provide evidence for policy considerations. The shocks that are analysed include e.g. natural disasters, macro-economic trends, changes in terms of trade, as well as public investment programmes. If impacts of potential future changes are investigated, various policy scenarios are often presented (e.g. Freeman 1998, Horridge and Wittwer 2008). Studies aimed at providing advice for a more effective management usually deals with the use of natural resources or anthropogenic pressures on natural environment.

The third strand of research – more heterogeneous than those described above – aims at identifying and mapping economic structures. It considers predominantly spatial linkages, trade flows, interconnectedness (and hierarchy) of regions, and feedback loops. Some studies focus explicitly on identifying fundamental economic structures in regions, followed by an evaluation of the relationships between the structural traits and various characteristics of economic flows (Hewings, Jensen, West, Sonis and Jackson 1989, Thakur and Alvayay 2012). Usually, a holistic approach to studying economic structures is adopted, but there are some exceptions, e.g. an inquiry of the changing role of the construction sector in regional economies (Pietroforte, Bon and Gregori 2000).

Decomposition analyses constitute the last group in the proposed typology. These studies investigate the factors underlying various output measures, such as labour productivity, $CO_2$ emissions or economic growth of a region. Occasionally, a focus is shifted from outputs to one of the factors behind them, as it is in the case of the influence of home market effects on exports from the manufacturing sector (Zhang and Ning 2011).

Finally, there is a small cluster of studies reviewing the IO analysis' developments. Two of them report on the national – Dutch (Oosterhaven 1980) and Canadian (Salem and Siddiqi 2008) – experiences in the field of sub-national IO Tables. The third one is a more comprehensive historical review of regional IO analyses (Yuxian and Leigh 1992).

Apart from the type of research, we tried to establish a list of specific themes that are considered most often in the reviewed articles. Unlike research questions, the topics are related to a particular field of analysis, rather than to a type of an investigation undertaken in a given study. We do not attempt to devise a complete typology of such topics. Instead, we look for distinguishable and specific themes, that might be considered as important topics of analysis, found in at least 2 articles.

The most distinct, and thus most easily distinguished topic is the natural environment. There are seven studies dealing with various aspects of the human-environment relations, e.g. waste management (Kagawa, Inamura, and Moriguchi 2004, Kagawa, Nakamura and Inamura 2007), usage of water resources (Cazcarro, Duarte and Sánchez Chóliz 2013), emissions of pollutants (Feng, Siu, Guan and Hubacek 2012) or eco-efficiency (Amano and Ebihara 2005). These studies usually fall into the policy-oriented analyses category, as – by uncovering the factual spatial linkages and sectoral interrelations – they provide evidence for a more effective policy responses.

Estimation methodology is one of the most prevalent topics found in the articles we reviewed. Among these studies, the FLQ formula for estimating regional input coefficients and multipliers stands out as an important point of reference It is compared to other methods serving similar goals (Bonfiglio and Chelli 2008), calibrated (Flegg and Tohmo 2013), and criticized (McCann and Dewhurst 1998).

Another topic, investigated in three articles, is the relationship between the size of a regional economy and various characteristics of its IOT. Jensen, West and Hewingst (2014) and Thakur and Alvayay (2011) examined this relationship with regard to corresponding cells of the regional transactions tables. McCann and Dewhurst (1998) focused on the relationship between the size of a region and values of the expenditure coefficients.

Agriculture productivity is the next theme put under scrutiny in the analysed articles. One approach is to study the impact of a drought on the productivity of this sector in various regions (Horridge, Madden and Wittwer 2005, Wittwer and Horridge 2010). In the second approach the focus is switched to study the impact of growing productivity in the agricultural sector on urban and rural households (Wittwer and Horridge 2009).

Cluster analysis was identified as important theme in two articles. The first study used the qualitative IO analysis to identify industrial clusters in small-scale regions in Germany (Titze, Brachert and Kubis 2011). The second one moves a step further, using the identified clusters to assess their impact on employment growth (Kowalewski 2013).

## 6. Preliminary conclusions

To put outcomes of the content analysis in the context, we use the typology elaborated above in order to match it with different contextual information (see Table 3).

**Table 3.** Matching the typology of research aims with contextual information

| Type | Reg. studies *[n=22]* | Economics *[n=10]* | Env. studies *[n=5]* | Av. year of publication |
|---|---|---|---|---|
| **Methodological** | 8 | 5 | 1 | 2005 |
| **Identification of economic structures** | 7 | 4 | - | 2000 |
| **Policy-oriented** | 3 | 4 | 3 | 2007 |
| **Reviews of IOA developments** | 2 | - | - | 1993 |
| **Decompositon analyses** | 3 | 1 | 2 | 2006 |
| **Main themes** | - FLQ (and other estimation methods)<br>- Spatial linkages & hierarchy of regions | - Impact of various shocks on regional economies | - Management of natural resources | |
| **Av. year of publication** | 2001 | 2008 | 2009 | |
| **Leading countries** | AUS, USA, China | China, Japan | Japan | |

Source: own study.

First, we split the results by general fields of study. By attributing journals that occurred in our database to general fields of study, we were able to create three broad categories, i.e. regional studies, economics and environmental studies. Majority of articles was published in journals attributable to regional studies field – 22 papers. 10 articles were published in economic journals, and 5 – in journals representing the environmental studies discipline. The remaining 5 articles could not be attributed to any of these fields.

Regarding the regional studies field, the articles are found in each category of the proposed typology. However, two categories stands out as the most popular – methodology and identification of economic structures. This is reflected in main themes, found in the literature from this field, namely various estimation methods (including the notable FLQ formula) and assessments of spatial linkages and relations between regions and/or sectors. Looking at the average year of publication, we can claim that the regional studies field has the longest experience in the IO analysis on a regional (sub-national) level. Papers from both economics and environmental studies are on average published 7 to 8 years later. We can thus assume, that the IO analysis is an expanding field.

Articles from the economics field are found mainly in 3 categories – methodology, identification of economic structures and policy-oriented analyses. The main theme found in this strand of research is an evaluation of the impact of various shocks on regional economies.

Articles from the environmental studies' journals are pretty much policy-oriented, focusing especially on the effective management of natural resources. This strand of research is relatively well established in Japan – while analyses from the regional studies focus more often on Australia, USA and China.

Finally, we analyze the average year of publication for each of the research aims' categories. What we found striking is that reviews – a type of research that should become more visible with the development of the field – turn out to be lagging behind all other strands of research. However, this result suggests that our efforts might be aimed in the right direction.

## 7. Further research

The present paper is based only on articles that has been initially identified by using narrowly defined search terms. Due to the construction of the source databases, Web of Science and Scopus, the search queries has been applied not to full texts, but only to titles, abstracts and keywords. Consequently, there is a significant number of articles that has not been included into analysed dataset. Therefore, the next step should allow to include missing articles into the review. This process should be systematic and can involve – among others – detailed inspection of cited references included in the papers collected in the present phase of the exercise.

**Table 4. Review of selected interregional Input-Output papers ("regional ALL")**

| Title | Authors | Date | Journal | Analysed country | No. of regions | No. of sectors | Source of data for regional IOT | Type of article | | | | | main theme |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Methodological | Identification of economic structures | Policy-oriented | Review | Ddecomposition analysis | |
| A method for the estimation of hybrid interregional input-output tables | Oosterhaven | 1980 | Annals of Regional Science | n/a | n/a | n/a | n/a | | | | x | | development of Dutch regional IOA |
| A multi-regional representation of China's agricultural sectors using SinoTERM | West, Morison, Jensen | 1984 | Regional Studies | Australia | 10 | 11 | Statistical services | x | x | | | | estimation of hybrid interregional IOT |
| A new method to estimate input-output tables by means of structural lags, tested on Spanish regions | Freeman | 1988 | Socio-Economic Planning Sciences | Israel | 6 | 42 | Estimation | | | x | | | environment, impact of energy policies, policy scenarios |
| A Simple Multi-Regional Input–Output Account for Waste Analysis | Jensen, West, Hewingst | 1988 | Regional Studies | Australia | 10 | 11 | Statistical services | | x | | | | relationship between size of an economy and intensity of various transactions |
| A State Transformed by Information: Texas Regional Economy in the 1990s | Hewings, Jensen, West, Sonis, Jackson | 1989 | Socio-Economic Planning Sciences | n/a | n/a | n/a | n/a | | x | | | | spatial organization of production |
| A two-step approach to estimating state-to-state commodity trade flows | Zenios, Iu | 1990 | Annals of Operation Research | USA | 48 | 120 | Estimation | x | | | | | adjustment of RAS algorithm |
| An optimal equilibrium multi-regional model based on Israel's input-output tables | Yuxian, Leigh | 1992 | Chinese Geographical Science | n/a | n/a | n/a | n/a | | | | x | | historical development of the regional IO analysis |
| Analyzing drivers of regional carbon dioxide emissions for China: A structural decomposition analysis | Akita | 1993 | International Regional Science Review | Japan | 9 | 23 | Statistical services | | | | | x | growth factors, interregional trade effects |
| Assessing the Behaviour of Non-Survey Methods for Constructing Regional Input–Output Tables through a Monte Carlo Simulation | Sonis, Hewings, Gazel | 1995 | Annals of Regional Science | USA | 4 | 3 | Estimation | | x | | | | spatial linkages, hierarchy of feedback loops |
| Bringing Regional Detail to a CGE Model using Census Data | Sonis, Hewings, Guo, Hulu | 1997 | Regional Science and Urban Economics | Indonesia | 5 | 3 | Estimation | | x | | | | hierarchy of regions, feedback loops |
| Canada's recent experience in constructing regional economic accounts | McCann, Dewhurst | 1998 | Regional Studies | n/a | n/a | n/a | n/a | x | | | | | FLQ, regional size and specialization |

| Title | Authors | Date | Journal | Analysed country | No. of regions | No. of sectors | Source of data for regional IOT | Type of article | | | | | main theme |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Methodological | Identification of economic structures | Policy-oriented | Review | Ddecomposition analysis | |
| Capital Stock Estimates by Province and Interprovincial Distribution in Indonesia | Pietroforte, Bon, Gregori | 2000 | Construction Management and Economics | Italy | 20 | 18 | Mixed | | x | | | | role of the construction sector in regional economies |
| Comparing Multipliers from Survey and Non-Survey Based IO Models: An Empirical Investigation from Northern Australia | Hitomi, Okuyama, Hewings, Sonis | 2000 | Economic Systems Research | Japan | 9 | 40 | Statistical services | | | | | x | factors of output growth |
| Development of the Interregional I/O Based LCA Method Considering Region-Specifics of Indirect Effects in Regional Evaluation | Lantner, Carluer | 2003 | Annals of Regional Science | France | 6 | 6 | Statistical services | | x | | | | interconnectedness of regions, feedback loops |
| Eco-intensity analysis as sustainability indicators related to energy and material flow | Kagawa, Inamura, Moriguchi | 2004 | Economic Systems Research | Japan | 9 | 42 | n/a | | | x | | | environment, waste management |
| Evaluation of role of home market effects in China's manufacturing industries | Amano, Ebihara | 2005 | Management of Environmental Quality | Japan | 47 | 16 | Statistical services | | | x | | | constructing an indicator of eco-efficiency, environment |
| Identification of regional fundamental economic structure (FES) of Chilean economy: A field of influence approach | Oosterhaven | 2005 | Geographical Analysis | The Netherlands | 40 | 38 | Non-survey multipliers from survey tables | x | | | | | non-survey multipliers |
| Inter-industrial relations and sectoral employment development in German regions | Horridge, Madden, Wittwer | 2005 | Journal of Policy Modeling | Australia | 45 | 38 | Estimation | x | | x | | | impact of natural disaster on agriculture, outline of the TERM CGE model |
| Interpreting spatial economic structure: feedback loops in the Indonesian interregional economy, 1980, 1985 | Kockelman, Jin, Zhao, Ruíz-Juri | 2005 | Journal of Transport Geography | USA | 254 | 18 | Survey | | | x | | | impacts of travel costs and export demands on trade patterns |
| Interregional interdependence and regional economic growth in Japan: an input-output analysis | Salem, Siddiqi | 2006 | Statistical Journal of the United Nations | Canada | 14 | 300 | Mostly survey | | | | x | | Canadian regional IO framework |
| Labor productivity differences in China 1987-1997: an interregional decomposition analysis | Yi, Itsubo, Inaba, Matsumoto | 2007 | International Journal of Life Cycle Assessment | Japan | 6 | 46 | Statistical services | x | | | | | life cycle assessment (LCA), environment |

| Title | Authors | Date | Journal | Analysed country | No. of regions | No. of sectors | Source of data for regional IOT | Type of article | | | | | main theme |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Methodological | Identification of economic structures | Policy-oriented | Review | Ddecomposition analysis | |
| Measuring Spatial Repercussion Effects of Regional Waste Management | Kagawa, Nakamura, Inamura | 2007 | Resources, conservation and recycling | Japan | 9 | 21 | n/a | | | x | | | environment, waste management |
| Multiregional input-output model for the evaluation of Spanish water flows | Park, Gordon, Moore II, Richardson | 2008 | Annals of Regional Science | USA | 51 | 29 | Estimation | x | | | | | estimation of trade flows using secondary data |
| Regional development and construction in Italy: an input-output analysis, 1959-1992 | Bonfiglio, Chelli | 2008 | Economic Systems Research | n/a | n/a | n/a | n/a | x | | | | | non-survey methods for constructing regional IOT |
| Regional Differentiation of Coefficients of Direct Expenditures in Input–Output Symmetric Tables | Yang, Lahr | 2008 | Review of Regional Studies | China | 9 | 5 | Statistical services | | | | | x | labour productivity decomposition |
| Regional input-output tables and the FLQ formula: a case study of Finland | Horridge, Wittwer | 2008 | China Economic Review | China | 31 | 63 | Estimation | x | | x | | | impact of new rail link, outline of the SinoTERM CGE model |
| Regional size, industrial location and input-output expenditure coefficients | Wittwer, Horridge | 2009 | China Agricultural Economic Review | China | 41 | 49 | Statistical services | | | x | | | agriculture, impact of productivity growth |
| Review of Dutch regional input-output analysis | Na, Min-jun, Fei | 2009 | Systems Engineering - Theory & Practice | China | 8 | | Statistical services | | x | x | | | mapping regional differences and linkages, impact of investment policy scenarios |
| Roles of regional differences and linkages on Chinese regional policy effect in CGE analysis | Wittwer, Horridge | 2010 | Spatial Economic Analysis | Australia | 150 | 172 | Survey | | | x | | | impact of changes to terms-of trade, impact of drought on agriculture productivity |
| SinoTERM, a multi-regional CGE model of China | Stoeckl | 2010 | International Regional Science Review | Australia | 6 | 15 | Survey and non-survey tables | x | | | | | multiplier estimates from survey-based IOT and non-survey IOT |
| Spatial dominance: a new approach to the estimation of interconnectedness in regional input-output tables | Jiang, Dietzenbacher, Los | 2010 | Environment and Planning | China | 27 | 31 | Statistical services | x | | | | | selecting cells for collecting superior data for hybrid IOT |
| Spatial interpolation and disaggregation of multipliers | Oosterhaven, Escobedo-Cardeñoso | 2011 | Papers in Regional Science | Spain | 11 | | Survey and non-survey tables | x | | | | | spatial projection method, RAS |

| Title | Authors | Date | Journal | Analysed country | No. of regions | No. of sectors | Source of data for regional IOT | Type of article | | | | | main theme |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Methodological | Identification of economic structures | Policy-oriented | Review | Ddecomposition analysis | |
| Targeting the collection of superior data for the estimation of the intermediate deliveries in regional input – output tables | Tu, Sui | 2011 | Regional Studies | USA | 13 | 3 | Statistical services | | | x | | | impact of the evolution to information economy on regional economy strucutre |
| Techniques of constructing regional input-output tables: achievements | Zhang, Ning | 2011 | Chinese Geographical Science | China | 30 | 42 | Statistical services | | | | | x | growth factors for given sectors |
| The Identification of Regional Industrial Clusters Using Qualitative Input–Output Analysis (QIOA) | Sayapova | 2011 | Studies on Russian Economic Development | Russia | n/a | 45 | n/a | x | | | | | regional differentation of technological coefficients |
| The impact of the 2002-2003 drought on Australia | Titze, Brachert, Kubis | 2011 | Regional Studies | Germany | 439 | 71 | Statistical services | | x | | | | industrial clusters, qualitative IOA |
| The role of international trade in generating change in the regional economies of Japan | Feng, Siu, Guan, Hubacek, | 2012 | Journal of Industrial Ecology | China | 28 | 73 | Statistical services | | | | | x | environment, drivers of regional CO2 emissions |
| The Spatial Organization of Production: An Input-Output Perspective | Thakur, Alvayay | 2012 | Structural Change and Economic Dynamics | Chile | 13 | 25 | Statistical services | x | x | | | | fundamental economic structure, relation between size of a region and its IOT |
| The structure of multi-regional trade flows: hierarchy, feedbacks and spatial linkages | Kataoka | 2013 | Asian Economic Journal | Indonesia | 26 | | Statistical services | | | | | | IOT as an information source to trade flows analysis |
| The study of regional economic structure using input-output tables | Kowalewski | 2013 | Jahrbucher fur Nationalokonomie und Statistik | Germany | 97 | 60 | Estimation | | x | x | | | impact of industrial clusters on employment growth |
| Tracking land use, transport, and industrial production using random-utility-based multiregional input–output models: Applications for Texas trade | Cazcarro, Duarte, Sánchez Chóliz | 2013 | Environmental Science and Technology | Spain | 17 | 40 | Survey | | | x | | x | environment, water management |
| Vector and parallel computing for matrix balancing | Flegg, Tohmo | 2013 | Regional Studies | Finland | 20 | 37 | Statistical services | x | | | | | FLQ, input coefficients and sectoral output multipliers |

Source: own study.

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