

Report on Bachelor Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University

Student:	Jana Možíšová
Advisor:	Milan Ščasný
Title of the thesis:	Water footprint of consumption of the Czech households

OVERALL ASSESSMENT

Short summary

The thesis applies the Environmentally-Extended Multi-Regional Input-Output Model to quantify water footprint —blue and green water. This part of the analysis is linked to household-level expenditure data (CES) to derive consumption-based water footprint of 90 product groups for almost 3,000 households. Footprint of blue and green water is computed for the Czech Republic for the first time. Distribution in water footprint is analysed through the Lorenz curve and the Gini index. Last, expenditure elasticity per COICOP categories is estimated by OLS.

Contribution

Literature on the MR IOA is reach the EE IOA studies have been growing for last 10-15 years. Despite this fact, there are still very few studies on water footprint and the literature that links the hzbrid EE MR IOA and the household-rich CES is very scarce. Jana's thesis therefore contributes largely to fill this gap (empirically).

This thesis in its main part follows the PhD thesis and the article published in Ecological Economics by Mach, Weinzettel, Scasny (2018). Jana's approach is even better – she has improved how the IOT is bridged to the CES, implementing the RAS approach described by Cai and Rueda-Cantuche (2019). Moreover, she used the most recent data.

Methods

The hybrid IO model is applied that links the single-region input-ouput table (for the Czech economy) with the environmentally-extended multi-regional input-output tables (covering the whole world). This hybrid model is then linked to the Consumer Expenditure Survey household-level data, following the RAS approach. As the main results, water footprint is derived for every household in the CES dataset. This presents the high-standard in the field and this approach is used at a PhD level, rather at bachelor programs. At the end, water footprints are associated with household expenditures to derive the elasticity by COICOP categories, using the OLS. Distribution in water footprint is then analysed through the Lorenz curve and the Gini equality index. Analysis of the association between water footprint and socio-demographic characteristics of households remains for future research.

Literature

Relevant literature has been reviewed and in my opinion all materials that were needed are used and well referenced. This thesis demonstrates author's good understanding and command of recent literature. The literature is quotted in a proper way.

Manuscript form

The thesis follows a logical structure. The text is very clear and the thesis is written in good English, however, some parts would require more editing and proof-reading. Exposition of the results is clear and

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nically readable. Tables (Results section) should follow more professional style. This is a shortcoming of the thesis.

Overall evaluation and suggested questions for the discussion during the defense

The Input-Output analysis does not present a sophisticated modelling approach, however, the hybrid EE MRIO model is time- and data-intensive exercise and it presents the high-standard in the (IOA) field. Moreover, according to my experience, the hybrid EE MR IOA is the approach that has been used at a PhD level, rather as a part of bachelor programs as at Charles University (see, e.g. Mach et al., 2018) as abroad. No doubt, the application of the EE MRIO analysis that is linked to the CES presents very nice and not-easy performed research, noted that it was carried out at a bachelor level! Moreover, Jana carried out major part of presented analysis during the summer when for most of that time I was abroad either attending conferences or taking my vacation and hence could not help or guide you as much as I wish. Considering this fact, I need to acknowledge Jana was able to show her skills and independent capabilities to perform research that requires the application of non-trivial quite sophisticated modelling approach, even at the bachelor level.

Questions:

1. What is the contribution of imports and domestic production to water footprint. In other words, how one would be mistaken if only the the single-region input-ouput analysis is used to quantify water footprint?
2. What is the advantage of using the RAS method to bridge the household expenditures and the derived water intensities (coimng form the EE MRIOA)?
3. Are the coefficient estimates as reported in Table 3 (i.e. the expenditure elasticities) significant?

In my view, the thesis fulfills the requirements for a bachelor's thesis at IES, Faculty of Social Sciences, Charles University, I recommend it for the defense and suggest a **grade A**.

The results of the Urkund analysis do not indicate significant text similarity with other available sources.

SUMMARY OF POINTS AWARDED (for details, see below):

CATEGORY	POINTS
<i>Contribution</i> (max. 30 points)	30
<i>Methods</i> (max. 30 points)	30
<i>Literature</i> (max. 20 points)	20
<i>Manuscript Form</i> (max. 20 points)	14
TOTAL POINTS (max. 100 points)	94
GRADE (A – B – C – D – E – F)	A

NAME OF THE REFEREE: *Milan Ščasný*

DATE OF EVALUATION: *30 August 2023*

Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

CONTRIBUTION: *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

METHODS: *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

MANUSCRIPT FORM: *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

Overall grading:

TOTAL	GRADE
91 – 100	A
81 - 90	B
71 - 80	C
61 – 70	D
51 – 60	E
0 – 50	F