

# Report on Master Thesis

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

<b>Student:</b>	<b>Trouble Elisa</b>
<b>Advisor:</b>	<b>Jaromír Baxa</b>
<b>Title of the thesis:</b>	<b>Emissions-output decoupling: evidence from long-run and short-run elasticities</b>

## OVERALL ASSESSMENT

### Short summary

The thesis investigates the relationship between the economic growth (GDP) and the environmental status (GHG emissions) using a panel of 23 countries over the period 1990-2021. It begins with a standard analysis of emission-output relationship, continues with a decomposition of this relationship into its trend and cycle components by applying the Hodrick-Prescott filter, as proposed by Cohen et al. (2017, 2018, 2019, 2022), and, last, it examines the Environmental Kuznets Curve (EKC) hypothesis that is further augmented by other factors and fixed effects (i.e. the global scale models). The approach developed by Cohen et al. allows distinguishing longer-run trends in this relationship from short-run cyclical fluctuations.

### Contribution

The thesis is based on the work by Cohen et al., but Elisa uses this approach on a richer dataset (the period up to 2021). Elisa's discussion on various approaches to test the EKC is worth to read (pages 14-22). The examination of the trend and cycle component of the emission-output relationship is complemented by the EKC testing, although it is a pity that the two complementary approaches have not been better linked when interpreting the results and providing a policy conclusions.

Robustness check on different periods (1990-2005), testing for co-integration, and using different filtering methods (HP vs. Hamilton filter) is also the strength of the thesis.

### Methods

As being said, this thesis follows the work by Cohen et al., complemented by more standard (simple) approach and the EKC testing, enriched by augmented model specifications and robustness checks. All methods have been implemented well, with appropriate testing. The emission-output relationship is investigated using the production- as well as consumption-based GHG emissions. The issues typical for the EKC studies such as endogeneity, cross-sectional dependence in panel data, the omitting variable problem, and autocorrelation have been correctly discussed.

The global level analysis is based on „...aggregating all values of a variable for a single year for all countries to create a new “world“ time series....“ (page 36), later, it is said that the dependent and independent variables are „the sum of trends ...“ (*ibid*). I am a bit confused here since summing the trends or even changes over the countries for given year would not have a sense.

The methodology, the methods, and approaches all fulfill the requirements for a master's thesis. Compared to other master theses, Elisa has discussed and applied a variety of approaches and models that is very good. I only miss better integration / a synthesis of the results coming from all of these approaches and models.

### Literature

Literature review is rich and presents a strong part of the thesis. Relevant literature has been reviewed and all materials are well referenced, except the key and very recent paper by Cohen et al. (2022 *J of Macroeconomics*). This thesis demonstrates author's very well understanding and command of recent literature. The literature is quoted in a proper way.

### Manuscript form

The thesis has a high standard and it follows a logical and coherent structure. The text is very clear and the thesis is written in good English. Exposition of the results is clear, but the results coming from various parts might be

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better summarised and synthetizes. Moreover, if the the Hodrick-Prescott filter is decomposing the relationship into the short-run cyclical fluctuations and long-run trends, it would be useful to report the components and the overall association side-by-side.

Writing style will require more polishing. First, results are presented in not convential way, reporting the coffeicients estimated and p-values, without showing s.e.'s and/or t-values. Some results that are not statistically significant at any convenient level are reported in figures as being significant, e.g. beta for Italy and Ukraine in Figure 5.1 (contrast to Table 5.1). Presenting the mean with the CI95 would be better. Moreover there seem to be a typos, see beta=2.19 for Italy (Table 5.1) versus ~1.25 in Figure 5.1. Table 5.3 should be placed in next section (5.3.2). Second, there are several typos (e.g. cpn-sumption in Note under Table 5.3). Legends (describing the x- and y-axes) in figures are missing (see e.g. Figure 5.10). Third, tables require editing, especially tables 5.8, 5.9, and 6.1 are not clear at all.

## Overall evaluation and suggested questions for the discussion during the defense

This thesis presents a very nice and high quality piece of empirical research. The student has discussed and estimated several models that made this thesis very rich and also heavy (I even think that two —not one— theses might be prepared based on Elisa's work. My feeling is, however, that the richness of the models used and robustness check is on the costs of the results exposition and interpretation due to possibly a lack of time reained at the end of wrting the thesis. This is a pity, otherwise I would have any objection to evaluate this thesis as excellent.

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

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

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

<b>CATEGORY</b>	<b>POINTS</b>
<i>Contribution</i> (max. 30 points)	28
<i>Methods</i> (max. 30 points)	30
<i>Literature</i> (max. 20 points)	20
<i>Manuscript Form</i> (max. 20 points)	8
<b>TOTAL POINTS</b> (max. 100 points)	<b>86</b>
<b>GRADE</b> (A – B – C – D – E – F)	<b>B</b>

**NAME OF THE REFEREE:** Milan Ščasný

**DATE OF EVALUATION:** 19 June 2023

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**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