

## REVIEW OF THE BACHELOR'S THESIS REVIEWER

Student's name: Martin Stastny .....

Thesis title: The Rebound Effect: Magnitudes and Mitigation Policy .....

Name of the thesis reviewer: Ing. Helena Chytilova, Ph.D., M.A. ....

	1	2	3	4
<b>Assessment of the topic itself</b> (irrespectively of the student):				
1.1 To what extent is the topic current and significant?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 How challenging is the topic in respect of theoretical knowledge?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 How challenging it in respect of practical experience or fieldwork?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1.4 How difficult is it to get background materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### **Verbal assessment (several sentences), in particular:**

*Subsection 1.1:* The energy efficiency is highly topical issue with respect to the Europe 2020 strategy and adequate policies implemented at national levels.

*Other (as appropriate):* Author has not experienced any difficulties with data gathering, because the thesis is purely summary of the relevant theory without empirical model.

### **2. Evaluation of the thesis structure and logical cohesion:**

2.1 To what extent is the thesis structure logical and transparent?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 To what extent does the author use current / suitable sources?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.3 How properly did the author select methods in respect of the topic?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4 How sufficiently and functionally did the author use in the thesis original charts, tables, data, annexes, etc.?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.5 What is the compatibility level for the thesis basic line elements: topic – thesis assignment – objective – structure - conclusions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### **Verbal assessment (several sentences), in particular:**

*Subsection 2.1:* The structure of the thesis is logical. Brief introduction is available in the beginning with regards to the rebound effect, followed by more thorough discussion. This makes orientation for the reader much easier. Critical remark would apply to subchapter 1.4.1, which could be structured better in terms of logic. Equation a) b) and c) on p.17 are not explained appropriately with respect to applied terminology about demand elasticity. I suspect that there is some mistake present, because even indexes (some of the unknown to the reader) are not compatible with an explanation. The same holds for equation (2), whose formula is not correct in the part which contains partial derivations. More subtle explanation would be desirable for this part to clarify the context. Sometimes for the sake of logic it would be

desirable to add missing derivations, although it may sound trivial, (p.18 and derivation of equation (3)).

*Subsection 2.5:* More in subsection 3.5

*Other (as appropriate):*

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### 3. Assessment of the thesis text quality:

3.1 How well – in terms of depth and quality – did the author analyze the topic?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.2 Did the author formulate the thesis objective clearly and with logical structure?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.3 Did the author fulfill the defined thesis objective and approved assignment of the thesis that contains the objective?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.4 How well – in terms of depth and quality – did the author cover the theoretical part of the thesis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.5 How well – in terms of depth and quality – did the author cover the practical / analytical part of the thesis?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6 To what extent are the thesis conclusions logically structured and show quality, and what is their added value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### *Verbal assessment (several sentences), in particular:*

*Subsection 3.2:* Goal of the thesis is clearly stated in abstract and also in introduction.

*Subsection 3.3:* Author has fulfilled objective of the thesis, however with drawbacks addressed below in section 3.5.

*Subsection 3.4:* See section 3.5 for more details.

*Subsection 3.5:* It is highly appreciated that author supports his arguments with good illustrative examples. The text is compact and succinct on average, well-structured with minor logical deficiencies, with mostly adequate conclusions, but sometimes missing argumentation due to some sections, where discussion goes on surface. I have listed the most important remarks below:

- i) Author correctly points out that efficiency improvement is of endogenous nature instead reflecting autonomous technological developments. However more attention could be paid to this problematic.
- ii) Was there any reason behind the choice of Greening's classification (2000) of rebound effects mentioned on p.13? Although author has applied this classification, he has omitted the last section devoted to "Transformational Effects"-the most general rebound effect, although neglected in the literature.
- iii) Author has not discussed in his thesis the total cost of an energy service like energy cost, annualized capital cost, operation and maintenance cost, time cost.
- iv) Author claims on p.20 that there are not so many attempts investigating the magnitude of the indirect (macroeconomic) rebound effect. However he does not provide any supplementary information about the difficulties with respect to applied methods. It is worth to mention that verification of such a phenomena requires analysis of cross-price and income elasticities of the whole consumer basket, input-output model or almost ideal demand system, (AIDS). Economy's wide rebound effect on p.21 goes just on surface without mentioning that computable general equilibrium models are helpful to estimate aggregate effects. Limitation should have been also mentioned, for instance correlation between energy efficiency and other input costs, correlation between energy efficiency and quality attributes of an energy service,

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dependence of energy efficiency on energy prices (which was almost not mentioned) or constraints on the demand for useful work. Author could also enrich discussion about macroeconomic rebound effect by discussion about macroeconomic price effect and macroeconomic growth effect according to Gillingham (2013).

v) On p.16 author states that substitution and income effect play big role at microeconomic level of rebound effect, however appropriate explanation of effects is missing.

vi) According to the author, critics of traditional method argue that the assumptions do not reflect reality, such as the demand for energy services. This is mentioned in one sentence only and author does not represent anyhow possible models of demand for energy services, although it would be desirable in this context. For instance Becker's household production model could be applied or model within neoclassical framework.

vii) Author has not distinguished the rebound effect according to the time horizon. The short run rebound effect refers to a change in utilization of a given stock of appliances (for instance driving more km), while the long run rebound effect refers to a change of the appliance shock (for instance buying more or larger cars).

viii) About the evidence of the rebound effect:

The list of bibliography could be richer, because there exist vast amount of literature, which examines rebound effect. Contribution of the author is rather narrow in this sense. For instance in section devoted to household sector, I am missing additional studies like Schwarz and Taylor (1995), Haas et al (1998), Guertin (2003), Klein (1988), Dubin, McFadden (1984). Or studies, which examine other than household heating, for instance demand for energy used for space cooling, Nesbakken (2001), Hausman (1979), Dubin (1986). Additionally there is a significant contribution to the transportation sector, for instance Wheaton (1982), Gately (1992), Greene (1992), Orasch and Wirl (1997), Puller and Greening (1999), Greene et al (1999), Goldberg (1996) or Walker and Wirl (1992).

ix) On p.37 author claims that regulations and standards tend to decrease prices for goods. I would argue exactly in the opposite manner. It is desirable to view two sides of one-sided phenomenon.

x) Sometimes one comes across unfinished comments or brief statements without further explanation, (for instance "substitution and income effect", p.16 or "not saturated demand in developing countries", p.29).

xi) More subtle explanation is needed in section 2.2.1 with respect to reasons triggering rebound effects.

*Subsection 3.6:* The main value added is represented by section devoted to policy implications aimed to reduce rebound effect. I also appreciate section devoted to discussion. I would suggest that both chapters represent huge potential for discussion with respect to efficiency of adopted government policies. For instance it might be argued whether indirect multiplication of rebound effect is not present through investment of firms into cheaper technologies, based on initially imposed policy measures, (aimed to reduce a very first rebound effect).

Or the problem (mentioned in a very good way by the author) about the trading with CO2 emission permits, which weakens potential effect of applied policy aimed to reduce pollution on p.36.

Nice application seems to be case study of Germany, however the author could extend more deeply discussion about efficiency/inefficiency of applied policies. The potential of case study was not fully utilized by author.

Sometimes author's conclusions are too ambitions, because they rest on improper grounds not supported by any hard data or even not based on empirical studies, or conclusions extend too

far and become disputable, (p.41 and the paragraph below Figure 6 or statement on p.43 “Energy taxes should be raised at least in connection with the increasing energy productivity in order to prevent rebound effects by lower energy costs”. This statement raises questions about the extent to which the taxes should be raised, which is highly disputable issue, requiring further empirical research.)

*Other (as appropriate):*

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#### 4. Assessment of the thesis form and style:

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 4.1 What is the formal layout of the thesis?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4.2 What is the quality of citations and references? Are sources identifiable?                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4.3 What is the stylistic level of the thesis, particularly the use of correct economic terminology? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

#### ***Verbal assessment (several sentences), in particular:***

*Subsection 4.2:* Author has not opted for unified citation style. Additionally, citation style does not fulfill standards of University’s referencing requirements for the thesis. More detailed summary is listed below:

Figure 7 on p.51 is not Figure, but Table and appropriate source is not cited. The same about the citation holds for Figure 8, p.52. Sources are not listed even for Figure 1 (p.9), Figure 2 (p.10) Figure 4 (p.27), Figure 5 (p.35) and Figure 6 (p.41) although author uses concrete data based on some database, (which is however unknown due to absence of the source).

Although there are some direct citations, author does not supplement the referencing with appropriate page, (for instance on p.11 and citation of EU (2006), on p.12 and citation of The Coal Question (1965)).

Citation style is inconsistent throughout the thesis, (for instance p.13).

Citation in remark 18 on p. 33 is missing year of publication.

Section 1.4.1-It is impossible to distinguish between author’s own contribution and thoughts inspired by other studies, because author has not mentioned any references particularly in these sections: p. 17 a) b) c) and p. 18-19 equation (1) (2) and (3).

Some references cited within the thesis are not mentioned in final reference list, (for instance Small and van Dender (2007), (2005) on p.25 and Bruno de Borger (2015), West (2004) on p. 26.

Author does not provide readers with any reference on p. 41, although he directly mentions critical attitude with respect to development of fuel prices and taxation. Later on, he mentions some studies in section “Discussion”. Page 40 contains some historical data, despite that the adequate source is cited neither within the text, nor below the Figure.

*Other (as appropriate):* From formal point of view the thesis has plenty of drawbacks. Paging starts already at the page devoted to declaration and thereby introduction starts on page 6. JEL classification and key words below abstract are missing. Author allows for no space between titles/subtitles and text, (for instance p.9). Some Figures are straightly taken from the original documents without citing the original source and without adjustment, (as an example might server Figure 1 on p.9 with relict of German words). Sentences are often cut in the middle because of some comment within the brackets, which does not look good for reading purpose. There are sometimes typing errors within the text. The list of shortcuts would be also desirable, because sometimes author uses shortcuts without any explanation, (for instance p.10 and IEA). Economic terminology is not correct on p.17, (see subsection 2.1).

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**5. Overall assessment** *(It is necessary to state, whether the thesis meets the requirements of the Methodology of the Faculty of Economics in terms of the quality of contents, scope and formal requirements, whether the thesis is/is not recommended for defense. It may also be nominated for a special award, etc.):*

Based on afore-mentioned comments, I am in serious doubts, whether this thesis fulfills outlined academic standards.

The aims stated in the thesis were outlined carefully. However significant drawbacks are present not only with respect to the content, but also with regards to the formal requirements. On the one hand, there is quite interesting discussion about policies and their efficiency towards the rebound effect, on the other hand there are many drawbacks mentioned in section 3.5. I consider as the biggest problem citation drawbacks and unfulfilled formal requirements, like keywords, which should not be absent in insis system, (subsection 4.2 and others).

Finally, it is worth to stress the effort, which author invested into writing. It is visible especially in chapter devoted to discussion and chapter devoted to policies. However, the thesis needs careful revision, correction and enrichment based on above-mentioned remarks. I suspect that the time was the limiting factor, which contributed significantly to the final state of the thesis.

As a result, I am not able to fully recommend the thesis for the defense and I will leave it up to consideration of the committee whether these drawbacks are acceptable or represent significant problem.

**6. Questions and remarks to the defense:**

Under what conditions are regulations and standards more efficient/inefficient compared to pricing measures if framework of law and economics is applied?

Is the rebound effect overplayed and resulting need for public policy pointless?

Explain working of substitution and income effect within the phenomena of microeconomic rebound effect.

**Proposed grade: Good/Failed**

Date: 25.5.2016

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Signature of the Thesis Reviewer

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