

## **The review on the PhD dissertation thesis**

**Title:** Knowledge Spill-Over Effects and Methods of their Measurement

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The dissertation focuses on cognitive spillovers, which is the term used to describe how knowledge and ideas spread between entities (e.g., people, companies, or countries). This topic is important and highly relevant in the theoretical development of both economics and regional studies. It also has significant practical implications, particularly in the realm of public policy and regional development support strategies. The research reflects the increasing significance of global knowledge exchange and digital and economic connections. The thesis is comprised of five primary chapters and spans a total of 172 pages, inclusive of the bibliography.

### **The dissertation 's structure and the evaluation of its individual sections**

The first chapter is extensive in nature and provides a comprehensive overview of the theoretical approaches that have been utilised. The chapter is several dozen pages long and commendably presents both old and contemporary approaches. The theoretical underpinnings of the study are firmly anchored in the principles of endogenous growth theory and cognitive spillover theory within a business context. A significant contribution of the chapter is a comprehensive overview of various proxy dimensions (geographical, cognitive), accompanied by a critical evaluation of existing methods for measuring these effects.

In the second chapter, the author identifies research gaps in the literature, formulates the objectives of the dissertation, and develops hypotheses. In summary, the objective of this research is to address four significant challenges in the field of studying how countries innovate: measurement issue, R&D complementarity, adjustment cost and absorptive capacity. The gaps in scientific literature identified by the author are intriguing and have potential for further scientific investigation.

The third chapter is concerned with the presentation of the research design, the data that was utilised, the methods employed, and the estimation techniques that were employed. The selection of a wide range of mathematical and statistical methods by the author is to be appreciated. But the structure of this chapter could be improved by making it more systematic. In addition, the text lacks a basic description of two more complex methods that are mentioned and used in the following chapter. These methods include LASSO regression and instrumental variables. Furthermore, most of the methods described are not supported by references to basic literature in the field.

The fourth chapter is devoted to the presentation and discussion of the results. In this instance, it is important to acknowledge the substantial number of calculations that have been conducted and the utilisation of a variety of statistical methodologies. It is unfortunate that the presentation of these results is not always optimal, and their description is frequently somewhat unwieldy. It is not entirely straightforward to discern the flow and differentiate between the individual results.

In the final fifth chapter, the author summarizes his conclusions and formulates recommendations. The majority of these conclusions are logical and can be deduced from the results presented. However, in formulating them, the author mostly remains at a descriptive level without broader discussion of the context and other factors. The recommendations that are put forward are frequently only of a general nature. In consideration of the proxy variables under scrutiny (e.g., innovation measured through the high technology export) and the utilisation of methodologies whose assumptions may be on the verge of fulfilment (e.g., instrumental variables), it is also lacking to have at least a brief mention of the limitations of the presented results and the conclusions drawn from them.

### **Critical comments and remarks**

It is unfortunate that the relatively high professional quality of the dissertation is diminished by several mostly formal shortcomings. In the third chapter, the notation of formulas should be improved to ensure consistency in font size and the application of italics. Additionally, the incorporation of Figure 2, which details the research process and is situated at the end of this chapter without any reference or description in the text, is not optimal. Unfortunately, it is evident that the labelling of certain variables, for instance in Tables 2, 4 and the table located in the appendix, exhibits discrepancies. Furthermore, the inclusion of a single table within the appendix is superfluous; in this instance, it would be more appropriate to integrate it directly into the text. It is also regrettable that the dissertation contains a significant number of typographical errors.

### **Questions and recommendations for the defence**

- 1) The dissertation employs an indirect approach to measuring the innovative potential of a given country by means of high technology export. Did you consider or calculate other possibilities for indirectly measuring this variable?
- 2) The dissertation undertakes an analysis of panel data from 16 European countries. However, the specific selection of these countries remains unjustified within the text itself. Consequently, I would request that the author provides a concise justification for this selection.

### **Conclusion**

Based on a detailed assessment of the dissertation, I conclude that the author is well acquainted with the subject matter and has demonstrated extensive theoretical knowledge. It is unfortunate that the relatively high professional quality of the work is somewhat diminished by some of the shortcomings mentioned above. Notwithstanding these shortcomings, it is nevertheless important to acknowledge the considerable usefulness of the submitted dissertation, both in terms of the topicality of the subject matter and application to economic data. Overall, it can be said that the dissertation meets the requirements for this type of thesis, and I therefore **recommend** it for defence and propose the award of the scientific-academic degree of Ph.D.

In Pardubice, August 6, 2025

doc. Mgr. David Zapletal, Ph.D.