

## HABILITATION THESIS REVIEWER'S REPORT

### Masaryk University

**Applicant**

Lukáš Lafférs

**Habilitation thesis**

Essays in econometrics of model uncertainty

**Reviewer**

doc. PhDr. Jozef Baruník, Ph.D.

**Reviewer's home unit,  
institution**

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

The thesis under review is a collection of four academic papers, all of which make original contributions to the field of econometrics with a focus on model uncertainty. Due to the nature of economic research, model uncertainty is one of the key issues that researchers deal with and therefore the thesis is of general interest. More specifically, the author contributes to two recent strands in the literature. First, how to deal with model uncertainty in high-dimensional settings using machine learning methods, and second, how to perform sensitivity analysis of identifying assumptions using incomplete models. The thesis makes original and innovative contributions to these strands, which are important for a general economic issue, and therefore has solid potential for wider impact.

The originality and usefulness of the results can also be seen from the fact that they have been published in leading journals in the field, such as the *Econometrics Journal* or *Econometric Reviews*. The results have already gained recognition in the literature in terms of citations. Let me briefly discuss the contribution of each strand separately.

In the first strand, the literature attempts to select the best model among a potentially large number of competing alternatives. With the increasing availability of data, such model selection approaches are becoming more common and important in economic research, with a recent focus on high-dimensional methods. The first two papers contribute to this strand, in particular by introducing the new frameworks of mediation analysis and dynamic treatment effects. Both methods are generally applicable and thus useful for a wide range of economic applications where high-dimensional data can be used. I must emphasise here that I particularly appreciate the contribution of this strand, as there has been a strong recent surge in economics that tries to use and apply machine learning methods (or methods of advanced statistical analysis) to a number of economic problems, but at the same time few rigorously study and try to understand the underlying mechanisms, effects of variables or even causality. The two papers add to this important strand of literature and make valuable contributions.

The second strand deals with model uncertainty in a very different way, focusing on using as little information as possible and building a model that is not fully specified. An unwelcome consequence of such an approach is that it leaves objects of interest only partially identified. An important area in this strand relates to sensitivity analysis, where the importance of different model assumptions is explored by relaxing them. The third and fourth papers both contribute to such sensitivity analysis literature by extending mediation analysis and sample selection models.

### **Reviewer's questions for the habilitation thesis defence:**

While I enjoyed reading the thesis and appreciate its content as an econometrician, I often wondered if a general interest reader in economics would welcome a broader set of questions that could potentially be addressed. I understand that the focus here is on model development and the field of econometrics. At the same time, I think the results are very interesting and general. Therefore, the author might want to discuss the potential usefulness of the work for economics research bit more generally. Specifically, what kind of economic questions can be solved by the methods presented that could not be solved otherwise? Etc.

### **Conclusion**

In conclusion, the thesis contributes to the field of econometrics with a number of excellent ideas that advance our current understanding and open up new avenues of research. The thesis proposes novel and potentially important concepts, it contains original, contributing and rigorously executed work. Lukáš Lafférs' Habilitation Thesis, entitled Essays in econometrics of model uncertainty, therefore undoubtedly fulfils the requirements expected of a Habilitation Thesis in the field of economics.

Date: 26.1.2024

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