

Report on Master Thesis

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

Student:	Bc. Magdalena Škodová
Advisor:	PhDr. Jana Votápková, Ph.D.
Title of the thesis:	Improvement of risk adjustment for health insurance companies in the Czech Republic - compensation of costs of patients with renal failure

OVERALL ASSESSMENT:

Contribution

The thesis deals with a specific topic of risk adjustment which is gaining an increased attention in health economics' literature in recent years. Though focusing on the Czech risk adjustment mechanism, introduced in 2018, thesis's findings have an international relevance.

Risk adjustment models that include pharmacy-based cost groups (PCG) classification are currently the best available models redistributing pooled funds in public (or social) health insurance systems and are used in several European countries. Generally, the PCG classification builds on pharmaceutical consumption, because, apart from diagnosis, it prevents cheating in coding.

In the thesis, the author shows that adjusting classification of one particular indicator of a very costly disease, renal failure, is statistically significant in terms of capturing more accurately the targeted group of patients and also in terms of predicting better their costs. Thus, classification adjustments of the renal failure PCG category would be beneficial to the whole risk adjustment model and redistribution mechanism. Using a unique dataset, the thesis findings are transferable to other European countries that use PCG (and renal failure in particular) in risk adjustment without a necessity to perform similar extensive analysis.

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.

The author chose OLS as the main analytical method and she is aware of its limitations in the case of risk adjustments; in the Literature review chapter (and later in the thesis as well), she points out the benefits of using this statistical method, including the easy interpretation of its results. This is especially utilized in ch 5.2 when describing and interpreting the concept of risk indexes in the Czech risk adjustment system in a nice and understandable manner.

The heteroskedasticity issue is addressed (ch 4.2.3) by computing heteroskedasticity-robust standard errors.

5 different models are composed (results presented on page 48), differing in number of explanatory variables and in classification criterion for the renal failure (REN) disease. In ch 5.3, predictive power of these models is evaluated, using R-squared, forecasted values, and alternative predictive power measurements (MPE, MARE, MAPE).

Literature

The thesis demonstrates author's full understanding and command of recent literature.

In certain cases, the author should quote a specific legislation, such as Health Ministry's Directive, rather than the Act that authorizes the Ministry to publish such directive (but does not include the information itself). This is the case for example of Tables 1 and 2 in ch 2. Similarly, the author quotes journal articles when describing the current redistribution mechanism, while referring to the Act and associated Directives would be, at least in some places in the text, more appropriate. Lastly, a press release should not be ascribed to a spokesman, but rather to an institution (the case of Tichý references).

Manuscript form

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The thesis reads well, is well structured, and points made are clear. 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.

Summary and suggested questions for the discussion during the defense

The thesis represents a precisely processed theoretical analysis with practical outreach and applicable results. It demonstrates there is a potential for improvement of the Czech risk adjustment model by adjusting the classification criterion of the most expensive PCG group targeted on patients with renal failure. Dialysis procedure seems to be better indicator than consumed drugs in this case, while combination of the two is proposed to be the most suitable model.

During the defense, I suggest the author elaborates on the improved accuracy of predictions if the proposed change in classification takes place. Please refer also to the administrative burden issue that often limits number of PCG categories included in a model. In your opinion, is introducing 2 specific indicators for one disease a feasible option? What do you think based on international (Netherlands) experience?

Given the Czech renal failure prevalence is known, what is your qualified estimate of total HC costs of REN patients who are not currently classified in the PCG REN?

In the thesis, the author shows a good understanding of the Czech social health insurance system in terms of pooling of funds and redistribution mechanism, including historical consequences (Chapter 2). For the defence, I suggest the author explains why is it important to have a good risk adjustment model in place when individual risk rating is not allowed and what kind of health insurers' behaviour could be expected if potential quick-wins exist.

The author states she does not calculate with the reinsurance component in her analysis, but checks for outliers in ch 4.2.3 (page 45). However, the reinsurance component forms an integrated part of the Czech redistribution mechanism. For policy purposes, it might be nice to show what is the difference in predictive power of the proposed models if replicated with the reinsurance component as specified in the Czech law.

What would happen if the same treatment of outliers is employed as does the Czech risk adjustment mechanism? In practice, the risk indexes are set in a repetitive sequence of regressions in which a policy maker aims to find the proper balance between prospective and retrospective compensation (the later being the reinsurance). The final risk indexes account for the existence and volume of the reinsurance. The dataset would have to be adjusted as the risk adjustment administrator would do prior to comparing models' predictive power. In such case, all excessive' costs would be decreased to the first attachment point, but not omitted from the analysis. According to the Directive, the reinsurance attachment point is calculated as the sum of a patient's age, sex, and PCG risk-adjusted allocation plus a defined amount set by the Ministry (for 2018, this amount was CZK 206 000). Then, for illustrative purposes, the models would be fitted again using the adjusted datasets (different datasets for each model, but model 1 comparison is irrelevant in this case. No need to run repetitive regressions' sequence since the amount is known).

Such analytical exercise would have, of course, plenty of shortcomings stemming mainly from dataset composition. I understand the author did not want to operate with risk indexes because of the limited and population-wide non-representative sample. Though I believe an analytical exercise as proposed above would contribute to the conviction power of the thesis findings, I might have overlooked an important detail that may make such analysis useless. In such case, the author can elaborate on this issue during the defense as well.

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In my view, the thesis fulfills the requirements for a master 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:

CATEGORY	POINTS
<i>Contribution (max. 30 points)</i>	30
<i>Methods (max. 30 points)</i>	30
<i>Literature (max. 20 points)</i>	18
<i>Manuscript Form (max. 20 points)</i>	20
TOTAL POINTS (max. 100 points)	98
GRADE (A – B – C – D – E – F)	A

NAME OF THE REFEREE: PhDr. Lucie Bryndová

DATE OF EVALUATION: September 8, 2020

*Digitally signed (8.9.2020):
Lucie Bryndová
Referee Signature*

