

Report on Bachelor Thesis

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

Student:	Sergey Bolshakov
Advisor:	Jiří Kukačka
Title of the thesis:	Monetary Policy Under Behavioral Expectations: An Empirical Validation of the Heuristic Switching Model

OVERALL ASSESSMENT (provided in English, Czech, or Slovak):

Please provide your assessment of each of the following four categories, summary and suggested questions for the discussion. The minimum length of the report is 300 words.

Contribution

The bachelor thesis of Sergey Bolshakov considerably extends the recent research by *Hommes et al. (2019)* published in the *European Economic Review*. Sergey takes a behavioral macroeconomic model presented there and brings it to empirical data of the Euro Area. Because the original theoretical model is only tested via small-scale experiments with human subjects, its empirical verification with real-world macroeconomic time-series is an important additional step in potential future applications of that model for macroeconomic policy-making. And, even more importantly, the final empirical results clearly favor the behavioral model instead of an alternative model based on rational expectations.

As an interesting detail, I need to highlight here that Sergey was closely in contact with the authors of the *EER* paper and he actually corrected some mistakes in their code which was then also corrected and updated in the electronic archive of Elsevier.

Sergey also proposes an interesting methodological contribution at the level of the econometric estimation method called the SMM (will be commented below in „Methods“). In a nutshell, instead of the standard design of the optimization criterion function „J“ he develops and tests various alternative versions that account better for potential issues of multimodality resulting from potentially imperfect identification of parameters, or outliers, a consequence of a complicated multi-dimensional optimisation.

From the point of view of the supervisor, I am satisfied with the cooperation with Sergey and his very honest approach to the thesis elaboration, although the acceleration of the works on the thesis was very slow in the first year and the whole project took twice as much time than originally expected.

Methods

The thesis covers a range of methods definitely surpassing the bachelor level IES curriculum. First, Sergey demonstrates a good understanding of the theoretical framework of the New Keynesian Model and its behavioral extension to the Heuristic Switching framework. Second, he proves his ability to work with primary sources of macroeconomic data to prepare an updated dataset following the so-called Euro Area-Wide Model methodology. Third, Sergey very carefully but also skilfully implements the estimation methods of simulated moments (SMM) which he codes by himself completely from scratch. He also regularly discussed the implementation and various fine details of the method with one of its main proponents in behavioral macroeconomics, Prof. Franke from Kiel, Germany. The implementation of the SMM combines standard statistical and econometric tools with advanced concepts such as bootstrap, Monte Carlo simulations, and time-series filtering.

I especially like the methodology section where Sergey not only describes well the estimation method itself but also provides an analysis of the performance of the estimation method using simulations. In section „4.2 The 4-round Cross-Validation“ he carefully tests the various combination of possible model misspecifications and finds that the simulation-based analogue of the probability of type II error is 0% and of type I error is lower than 3%. The discriminatory ability of the estimation method between the two models seems very appropriate as standard significance levels.

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Literature

Although a part of the literature review is in fact „hidden“ in the Introduction, this is the weakest part of the thesis. It is so because the Literature Review section was being written in a relative rush during the very last weeks before the delivery deadline, which effectively precluded some potential extensions and improvements I standardly suggest to incorporate. E.g., an analytical approach such as clustering the literature according to some important concepts and patterns, compare and contrast approach, etc

The literature on behavioral macro is yet relatively scarce, so the number of items in the bibliography are appropriate. Also, citations are managed properly using a standard style for economic papers.

Manuscript form

The thesis is written in decent English and typeset in LaTeX, which I need to appreciate at the bachelor level. The most of formatting comments from my side were considered in the final version so no considerable complaints from my side here. Bibliography section seems complete and well-formatted. Referencing to tables and figures are done correctly in the text and tables are reasonably labelled and self-contained. The thesis is standardly structured and the text reads well.

An area of potential improvements is graphics. The histograms could have been more carefully elaborated, potentially smoothed using kernel density approximation, the width of bins and colors unified, the y-axes labeled (although not crucial), coefficients displayed using Greek letters, etc.

Summary and suggested questions for the discussion during the defense

My overall conclusion is positive, the thesis definitely meets IES bachelor theses standards and I can thus suggest the committee the grade B.

A potential questions suggested for the defense: A central concept of the Heuristic Switching Model is the definition of the set of available heuristics (Table 3.1, pg. 8). But not much attention is devoted to their discussion. Can you thus explain what are the behavioral phenomena or tendencies are reflected by each of these forecasting „rules-of-thumb“, give some real-world examples, or discuss why ordinary people, as well as professional analysts, are prone to follow these heuristics although economic science/profession often assumes highly rational and well-informed agents?

Moreover, how did the authors of the *EER* paper come up with this specific set of forecasting rules?

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

CATEGORY	POINTS
<i>Contribution</i> (max. 30 points)	30
<i>Methods</i> (max. 30 points)	30
<i>Literature</i> (max. 20 points)	10
<i>Manuscript Form</i> (max. 20 points)	17
TOTAL POINTS (max. 100 points)	87
GRADE (A – B – C – D – E – F)	B

NAME OF THE REFEREE: Jiří Kukačka

DATE OF EVALUATION: 28. 5. 2020

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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
30	15	0

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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
30	15	0

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
20	10	0

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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
20	10	0

Overall grading:

TOTAL	GRADE
91 – 100	A
81 - 90	B
71 - 80	C
61 – 70	D
51 – 60	E
0 – 50	F