Report on Bachelor Thesis

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

Student:	**Karel Chuchel**
Advisor:	**PhDr. RNDr. Josef Stráský Ph.D.**
Title of the thesis:	**Předpovídání inflace pomocí Bayesovské vektorové autoregrese**

Presented work fulfills all requirements of a good undergraduate thesis. The author understands the topic and managed it well.

The author evaluates the usefulness of vector and Bayesian vector autoregression in forecasting inflation in the Czech Republic. The thesis has a standard structure starting with a description of modelling frameworks and related literature followed by a data description, construction of particular forecasting models and ending with presentation of results. In the first chapter the author appropriately defines VAR and BVAR model and explains related terms. In the second chapter, selected variables are described and motivated. The third chapter discusses the construction of forecast (direct vs iterated), construction of particular models and implementation in Matlab. In the fourth chapter the author presents his results by evaluating the predictive power of individual models using standard measures (MSE, MAE, Theil's U, D-statistics). The author concludes that VAR and BVAR models proved to be better than random walk or AR process.

The thesis is well written and structured. I appreciate it is written in LaTeX given a large number of equations. There is a few grammatical and punctuation errors, but nothing fundamental. Overall, the manuscript form is very clear. Models and the method of solution are appropriate and well described. Objectives and research questions are well articulated.

The literature is well cited and covers some important studies. On the other hand, I consider the list of references as too short, especially with respect to the literature on VAR/BVAR for the Czech Republic. There is a number of studies which deserves to be noted and which would be useful for comparison with author's results (see e.g. CNB, 2012 or Babecky and Podpiera, 2008).

In addition, I have a few other comments:

(i) I am missing the exchange rate among selected variables. It is important to include this variable in VAR/BVAR models for the Czech Republic for several reasons: (a) structure of Czech economy (small open), (b) current monetary policy of the Czech National Bank (exchange rate commitment, see http://www.cnb.cz/en/index.html), (c) currency appreciation trend (many Central European economies are exhibiting trend appreciation of their currencies; see Babecky et al., 2010).

(ii) I am missing some external variables (e.g. commodity price, crude oil price, proxy for EA monetary policy etc.). These variables prove to be important predictors of some core variables for small open economies.

(iii) Consumer price inflation should be accompanied by net inflation. First, the CNB´s inflation targets were set in terms of net inflation until 2002. Second, the headline consumer price inflation includes items which the CNB cannot influence and which may be hardly predicted, especially if the model does not include external variables (see point (ii)). The additional estimation with net inflation might serve as a robustness check.

(iv) I am missing the uncertainty around presented forecasts, i.e. confidence intervals.

(v) The interpretation of results is sometimes a bit confusing (e.g. p. 30, last paragraph). The author claims that models based on post-crisis data (i.e.

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estimation period 1998-2010) give reasonable results while models including crisis period (2007-2009) give overestimated forecast. Obviously, the author discusses the same period twice while he gives two contradictory interpretations. This problem occurs several times.

Possible questions for the defense:

(i) You claim that models whose estimation period spans from 1/1998 to 12/2006 (i.e. do not include crisis period) overestimate inflation forecast while models estimated on data between 1/1998 and 12/2009 (i.e. include crisis period) give more reasonable results. What could be the reason?

(ii) All presented models (more or less) overestimate the forecast of inflation. Why is that? See e.g. CNB: Global Economic Outlook, June 2016, section 5 and p. 12.

Despite these comments, I consider the thesis as very good. **Therefore, I recommend the thesis to be accepted and graded „excellent“ (1, výborně).**

References:

[1] Babecky, J., Bulir, A., Smidkova, K. (2010): Sustainable Real Exchange Rates in the New EU Member States: What did the Great Recession Change? IMF Working Paper No. 10-198.

[2] Babecky, J., Podpiera, J. (2008): Inflation Forecasts Errors in the Czech Republic: Evidence from a Panel of Institutions, Occasional Publications - Chapters in Edited Volumes, in: Katerina Smidkova (ed.), Evaluation of the Fulfilment of the CNB's Inflation Targets 1998-2007, chapter 6, pages 77-85 Czech National Bank, Research Department.

[3] CNB (2012): Macroeconomic forecasting: Methods, accuracy and coordination, CNB Economic Research Bulletin

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

CATEGORY		**POINTS**
Literature	*(max. 20 points)*	15
Methods	*(max. 30 points)*	30
Contribution	*(max. 30 points)*	25
Manuscript Form	*(max. 20 points)*	20
TOTAL POINTS	*(max. 100 points)*	**90**
GRADE	**(1 – 2 – 3 – 4)**	**1**

NAME OF THE REFEREE: Simona Malovaná

DATE OF EVALUATION: 23. 8. 2016

Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

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

Strong	*Average*	*Weak*
20	*10*	*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.*

Strong	*Average*	*Weak*
30	*15*	*0*

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.*

Strong	*Average*	*Weak*
30	*15*	*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.*

Strong	*Average*	*Weak*
20	*10*	*0*

Overall grading:

TOTAL POINTS	**GRADE**		
81 – 100	**1**	= excellent	= výborně
61 – 80	**2**	= good	= velmi dobře
41 – 60	**3**	= satisfactory	= dobře
0 – 40	**4**	= fail	= nedoporučuji k obhajobě