

# Report on Bachelor / Master Thesis

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

Student:	Bc. Karel Chuchel
Advisor:	PhDr. RNDr. Josef Stráský Ph.D.
Title of the thesis:	Předpovídání inflace pomocí Bayesovské vektorové autoregrese (Inflation forecasting using Bayesian vector autoregression)

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

Bachelor thesis by Bc. Karel Chuchel aims on pseudo-out-of sample forecasting inflation in the Czech Republic using vector autoregression (VAR) and Bayesian vector autoregression (BVAR).

The forecasting methodology closely follows the rigorous thesis by Josef Stráský (Stráský J., Can Bayesian econometric methods outperform traditional econometrics in inflation forecasting, Rigorous thesis, 2011).

**Introduction and Motivation are written in an attractive and readable form, but they lack even brief literature review on inflation forecasting and forecasting by VAR and BVAR in general.** Even bachelor thesis should include literature review and achieved results should be compared to previous results from literature.

Methodology chapter is very well structured and describes rather complicated and laborious forecasting strategy. **Author presents one non-trivial improvement of so-called Minnesota prior used for BVAR estimation.** It is proposed to use inflation target of the central bank (Czech National Bank) as one of explanatory variable and to increase its effect on the model via alternative construction of Minnesota prior.

**Methodology chapter can be considered the strongest part of the thesis.** On the other hand, author should discuss the statistical rigorosity of the forecasting methodology and assess the plausibility of the results.

Results chapter presents the results of forecasting procedure using several settings of VAR and BVAR models. Author considers using two different periods for actual measurement of model performance – period after financial crisis (2010-2015) and longer period including financial crisis (2007-2015). Unfortunately, the selected best models differ significantly with the period of interest. This fact is commented in the Discussion chapter, on the other hand, this fact may also signalize poor plausibility of the forecasting strategy itself.

**The discussion is appropriate, but it might have been significantly better.** Namely, it is clear that the forecasting strategy using models with fixed parameters is not appropriate for longer time periods and the forecasts' plausibility is low. On the other hand, developing alternative methodology for time-varying parameters forecasts would be far beyond the scope of the bachelor thesis.

I appreciate Table 4.3, which includes the forecasts for year 2016. **Apart of the contribution in the Methodology section, the most important finding is that including inflation target into Bayesian prior for BVAR based forecasting improves the forecasting performance,** especially for models spanning over longer time periods (i.e. over both 'good times' and 'crisis times').

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**The manuscript is well structured and written in a very readable form.** Only few typos could be found. Usage of graphs and tables is appropriate.

As the advisor of this thesis, I must comment that the thesis should have been prepared in a more timely manner. Even small improvements in Introduction and Discussion chapters would increase the contribution of the thesis significantly.

**I recommend to accept this bachelor thesis. Summary of points awarded can be found below.**

**Possible topic for discussion:**

The ‚best‘ variables for inflation forecasting significantly differ for different time periods selected for pseudo-out-of-sample forecasting. Is this the sign of low plausibility of the forecasts? Or does it refer to different relationships between variables in the ‚good times‘ and in ‚crisis‘? How could we overcome this issue to establish forecasting strategy that would be more stable over time?

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

CATEGORY	POINTS
Literature (max. 20 points)	12
Methods (max. 30 points)	28
Contribution (max. 30 points)	22
Manuscript Form (max. 20 points)	19
<b>TOTAL POINTS</b> (max. 100 points)	<b>81</b>
<b>GRADE</b> (1 – 2 – 3 – 4)	<b>1</b>

**NAME OF THE REFEREE:** Josef Stráský

**DATE OF EVALUATION:** 02. 09. 2016



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**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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
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