Report on Bachelor Thesis

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

Student:	**Vojtěch Kořínek**
Advisor:	**PhDr. Jiří Kukačka, Ph.D.**
Title of the thesis:	**Cusp catastrophe theory: Application to the housing market**

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

In the thesis, the author successfully employs the stochastic cusp model to the housing market data from the U.S. The contribution is threefold. First, the author uses a unique dataset obtained from the Thomson Reuters Eikon database. Second, the author improves upon recent literature by including more explanatory variables into the analysis. And finally, he correctly estimates the model by taking into consideration the constant variance assumption of the cusp catastrophe model.

Methods used in the thesis are above the average level at IES, and student proved that he is capable of conducting a quality quantitative analysis. I find it essential that the author provides the right motivation for using the employed model and particular tools. The results of the estimations are correctly interpreted, and the performance of the employed models are compared with the benchmark models. It would be interesting to see the model performance on the longer period, i.e., longer pre-crisis and whole crisis period (dataset in the thesis covers only the period from March 2007), and consequently to evaluate the model's fit based on this period. Generally, the outcomes are discussed and depicted using proper figures and tables (for completeness, I would suggest to include also results of fitting ARMA-GARCH model in Section 6.2).

Regarding the exposition to the theory behind the model, everything is described clearly, and the author provides a useful heuristic explanation of how the model works. But some more detailed description of the technical aspects of the model would give the reader better intuition of the logic behind the model (e.g., why the dependent variable in the model is assumed to be a linear combination of the observed variable, see p. 24).

Thesis provides a sufficient review of the related literature and assess its pros and cons. Author appropriately relates his approach to the relevant research and addresses the differences arising from his approach. I have no comments on that.

The manuscript of the thesis is satisfying. Text is well organized, and each section is a natural continuation of the previous. The author provides various tables and figures to support his case. Almost no ambiguity in the formal presentation of the thesis is present with only a few exceptions (e.g., time series figures may include years instead of the number of observation on the x-axis). And few formal mistakes occurred, also, (e.g., the housing market is not a financial market), but all of them are just minor and do not affect the quality of the work.

Overall, the impression of the work is very good. The author proved that he could come up with a quality research topic and managed to solve it using non-trivial econometric methods. Few formal mistakes occurred, but these do not diminish the thesis in any significant way.

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Suggested questions for the discussion during the defense

The main "catastrophe" that occurred in recent history is the one preceding the financial crisis. You mentioned in the thesis that the explanatory variables are available only for a period starting in March of 2007. Do you have at least history of long-term interest rates to conduct the analysis from Section 6.2 to asses the fit of the model on the data containing the whole crisis period?

The fit of the model is assessed based on the coefficient of determination and information criteria. Is it possible to compare the models based on the prediction power of the housing crisis?

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

CATEGORY		**POINTS**
Contribution	*(max. 30 points)*	27
Methods	*(max. 30 points)*	27
Literature	*(max. 20 points)*	20
Manuscript Form	*(max. 20 points)*	17
TOTAL POINTS	*(max. 100 points)*	**91**
GRADE	**(A – B – C – D – E – F)**	**A**

NAME OF THE REFEREE: Mgr. Ing. Matěj Nevrla

DATE OF EVALUATION: 30.5.2019

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.*

Strong	*Average*	*Weak*
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.*

Strong	*Average*	*Weak*
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.*

Strong	*Average*	*Weak*
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.*

Strong	*Average*	*Weak*
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**