The Supervisor’s Appraisal

Title: Modelling the Volatility of Stock Markets
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The topic of the thesis is the issue of modeling the volatility of the stock indices. The theme is undoubtedly highly topical and appropriately chosen. Volatility of financial variables has especially nowadays significant impact on investors’ decisions. Measuring the degree of risk represents a key parameter in financial modeling area in general.

The goal of this thesis is to identify sudden breaks in volatility and determine an impact of these breaks on the volatility of stock market. For the propose of this thesis, the author used weekly time series of Chinese and U.S. stock markets, covering the period of 2000 - 2014 years. The goal of this thesis was fulfilled by three logical steps.

The proposed structure of the thesis corresponds to main goal of this thesis. Problem solving procedure is fully adequate to the analysis of the problem and set goal of the thesis. Appropriately chosen methods and techniques enabled to obtain adequate results. Problem solving procedure is fully adequate to the analysis of the problem. The author applied the ICSS algorithm, conditional volatility models (GARCH and FIGARCH) and carried out in-sample forecast in order to evaluate prediction quality of chosen models.

The main goal of this thesis as declared in Introduction section was fulfilled as supported by the methods applied and final results achieved. The thesis is, in accordance with the assignment, divided into six chapters. Third and fourth chapters can be considered as crucial and the most important parts of this thesis.

Second chapter has mainly descriptive character, and is focused on some typical features and application of high frequency data. Third chapter that can be considered as methodological part of this thesis is devoted to methodology of volatility models with and without sudden shifts. Afterwards, this chapter provided the modeling estimation procedures and the criteria of model selection. Finally, the author describes the Iterative Cumulative Sum of Squares algorithm.

The fourth chapter represents practical part of this thesis. In this chapter, the methods defined in Chapter 3 and statistical description of high frequency financial data were applied. Furthermore, an identification of sudden breaks and analysis of volatility persistence were carried out. In the final step, the author of the thesis also deals with the in-sample prediction of volatility and evaluates its quality on the basis of selected loss functions. In-sample forecasts were presented just for testing the quality of GARCH(1,1) models with and without dummy variables. Results were finally graphically presented in an appropriate manner and interestingly commented.

The whole thesis constitutes original work on empirical modeling and forecasting the volatility of selected stock indices and other related issues. Master student has demonstrated ability to work professionally with econometric software Eviews. In addition to this, some computations were carried in R software.

The results achieved by author are conclusive and interesting. Conclusions are mostly correct and are based on results without contradictions. The whole text is written logically,
argumentation and expression is at good level. The author's language is generally understandable, even though the author didn’t not avoid some minor typing errors. References to formulas, graphs and tables are also well done.

This thesis by its conception, structure and applied methodological base meets qualitative requirements for this kind of works. Therefore, I recommend it for defense.

Ostrava, May 15th 2015

Ing. Petr Seďa, Ph.D.
Thesis supervisor