OPPONENT OPINION

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Ph.D. dissertation

ECONOMETRIC MODELLING OF SOVEREIGN RISK

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1. Topic and objective

The selected topic is relevant, actual, and appropriate for scientific analysis. Three scientific research gaps were revealed by the literature review to specify the hypotheses, specifically on the subset of Polish (and for robustness check: Spanish and French) CDS markets, which country is an open and relatively small economy outside the Eurozone but within the European Union. Meanwhile, the selected topic has the potential for further analysis in the future both for investors and policy makers and for extending the current scientific knowledge in this field.

The objective is to study the nature of CDS pricing. To achieve the objective, the author set three research questions with a set of different econometric instruments. The first research question focused on the volatile Loss Given Default to improve the Probability of Default estimations. The second research question examined the non-linear nature of CDS and bond relations. The third research question used GARCH and neural networks to improve the forecasting of CDS volatility.

2. Structure

The dissertation has a logical structure, but the different research questions (and therefore the chapters) are loosely connected through the topic of CDS-pricing. Chapter 1 is based on an initial definition of the econometric problems and the introduction of the econometric research gaps, this is where the synthesis of the problems are presented. On this basis, it defines the objectives of the thesis including the research questions and hypotheses. Later chapters are unfolding these objectives. There is a good balance between the main results (presented as tables and figures) in the main text and the supporting side-results in the appendix. The

theoretical model is well connected to the literature, the variable and sample set is reasonable. The thesis employed an appropriate set of methods, to answer the hypothesis, namely: pricing modelling with TVLGD and CONSTLGD and FIXEDLGD, VaR-copula and a GEW-LSTM hybrid model or neural networks with GARCH-type conditional volatility models .

3. Data and Methodology

The author used appropriate primary and secondary data sources at a reasonable time interval and applied innovative econometric methods to study relevant questions. The description of the methods used is of good quality in a designated methodology-section for each research questions. In this specific sections, the author pointed on the advantages and disadvantages or limitations of the methods he used and how do they relate to the objectives. The input requirements are well specified, and the model diagnostics are highlighted as well. Robustness of the results were tested both on an extended sample of two additional countries and under different setups.

4. Findings and conclusions

The findings of this paper are extending the existing literature of financial risk management and econometrics as well as the results are useful for the understanding of the CDS pricing and its anomalies on a broader sample, not just for the sample countries – due to the numerous robustness checks of the models. The author was innovative to analyse the possible combination of multiple econometric approaches. In details, the author presented a consistent relationship between the PD and the LGD, a better calibration for the Value at Risk model (however, a similar application for the Expected Shortfall model would be more appropriate) and a hybrid usage of the GARCH-type conditional volatility parametrization within neural network forecasting. These three topics alone have proper support, but the cohesion between them is not articulated enough. An another issue is at the GARCH-type modelling: where the application of information criterias (AIC or BIC – as it was used in the third chapter) would provide a model selection opportunity. This would make a case-sensitive choose among GARCH, EGARCH and EWMA possible and would simplify the GEW-LSTM hybrid model as well.

5. Formal standards

The dissertation is in accordance with formal requirements with minor issues at the equations (like 2.6, 2.7, 2.13 where the style differs from the rest of the text, or at 2.1 the introduction of variable D is missing). The reference list contains sufficient and relevant sources, where citations from good-quality scientific journals predominate. The language follows the scientific

standards. This underlines the author's knowledge of the field of interest. The standard citation apparatus is used well throughout the dissertation. Likewise, the dissertation contains a number of figures and tables necessary to present the procedures and results.

6. Overall assessment

The author discusses an actual and relevant topic in the topic of Econometrics and Risk Management, with relevant implications for sovereign CDS-pricing. The author presented appropriate research skills by processing a large set of literature and by being able to use the econometric tools in the research part. The interpretations of the results are sufficient to answer the hypotheses. In summary, the thesis meets the scientific standards and requirements of Ph.D. dissertations.

Therefore, I do recommend the acceptance of the dissertation for the further procedures. Based on this dissertation, I propose to award a PhD degree to the Candidate.

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