

To the PhD examination board

Koen Schoors
Professor of Economics
Ghent University

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Contact
Koen Schoors

e-mail
Koen.Schoors@UGent.be

Modelling and forecasting univariate and multivariate time series
using Google data and copulae

By Dean Fantazzini

Report by Koen Schoors

I have read the dissertation of Mr Fantazzini with great interest. Before going into some of the details of the dissertation, I want to start by stating that Mr Fantazzini is beyond any doubt eligible to be awarded the degree of Doctor of Science in Economics. He has written a fascinating and inspiring series of articles that evolve around copula formula methodologies and employing trace data from Google trends for forecasting and modelling of economically relevant questions.

Throughout his dissertation the scientific quality is of a very high level, especially with respect to empirical methodologies and econometrics. He has focused specifically on the method of copulas, where he has both theoretical and empirical contributions, and on employing trace data like google trends for the nowcasting and forecasting. His contributions range from purely theoretical (deriving finite sample properties of estimation techniques), over the development of new methodologies to their application to specific economically and socially relevant cases and problems. This proves that he commands an impressive academic toolbox, has developed expert knowledge and competences in a wide array of fields and has a broad academic economic interest.

The concepts he introduces are always very well written and clearly explained and his findings are never based on speculations, but always on hard findings, facts and good reasoning on the basis of these established facts. It is definitely a scientific approach to socioeconomically relevant problems. The publication of his chapters in various rigorous and highly ranked academic journals also indicates his work has repeatedly passed the steep and sometimes painful test of peer review, which is more than ever the golden standard of quality in the academic world. In some of these journals I have also published myself (PloS ONE, Energy policy), so I can testify of their quality.

Personally I was also impressed by the very wide range of economic fields he has applied his methodological approach to. These include the modelling and measuring of operational risks (widely applied in banking), Value-at-Risk when dealing with multivariate portfolios (banking), modelling of financial bubbles (finance), nowcasting and forecasting the monthly number of food stamps recipients (public economics), modelling the decision to abandon or to proceed with a coal project (energy economics), modelling for the long-term forecasting of car sales in Germany (market analysis), explaining and predicting the dynamics of the Russian social well-being indices (public economics),

forecasting the realized volatility and the Value-at-Risk of the RTS index future, modelling the bitcoin price (exchange rate analysis) and the market risk and credit risk of a portfolio of crypto-currencies (finance). This is a very wide range of topics

It is also clear that, although some of his topics are just applications, most of his topics are highly relevant for policymakers. Improving risk management at banks has been the central focus of a lot of academic research after the 2008 financial crisis and ensuing great recession. Financial stability has become a preoccupation and the G20, all central banks of the world and policymakers at large, with a special and new focus and macroprudential risks and systemic risk. Financial bubbles lie at the heart of these efforts, but also the bitcoin and other cryptocurrencies are closely watched by policymakers in this regard. The relevance of nowcasting food stamps or social well-being for social policy-making demands no further elaboration.

I have been in the jury of more than 30 PhD., of which more than 10 at foreign faculties, and this dissertation is one of the most convincing pieces of work I have seen. In my view, this dissertation clearly corresponds to the criteria established at the National Research University Higher School of Economics and Mr. Fantazzini therefore fully deserves to be awarded the academic degree of Doctor of Sciences.

Sincerely yours

Koen Schoors

Comittee member

Full Professor Economics at Ghent University

Leading Research Fellow at the International Laboratory for Institutional Analysis of Economic Reforms of the HSE University Center for Institutional Studies National Research University Higher School of Economics

e-mail: koen.schoors@ugent.be

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PS a signed version of this report will follow shortly