

Multivariate state space methods for official statistics and climate modelling

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Propositions (stellingen) accompanying the PhD-thesis

Multivariate State Space Methods for Official Statistics and Climate Modelling

by Caterina Schiavoni

1. The choice of Google search terms is arbitrary and predictive power will depend on the specific set of search queries. A text mining approach could be a solution to standardise such choice. (Chapter 2)
2. Running the Monte Carlo simulations in R instead of C++ would have taken approximately two years instead of two weeks. Research on Big Data analysis and computationally intensive methods, must come with knowledge of fast programming languages. (Chapter 3)
3. No finding is also a finding. (Chapter 4)
4. The chemical life of nitrogen dioxide (NO_2) is short, i.e., hours to about a day. I therefore originally thought that time persistence in monthly NO_2 should be captured by a moving average type of econometric model, rather than an autoregressive one. However, econometric tools suggested the opposite. Geoscientific statements can be easily interpreted into wrong econometric model specifications. Stronger collaborations between econometricians and geoscientists may avoid this. (Chapter 5)
5. The estimation of nonlinear multivariate state space models becomes computationally challenging as the dimensions of the observed and latent vectors increase. This thesis partly contributes to elucidate how to estimate such models, but, especially given the issues raised in Chapter 4, much research in this direction is still needed.
6. Econometrics papers should be more transparent about the numerical implementation (and related issues) of econometric methods.
7. I have the tendency to give too much importance to extreme events in real life, and I feel that, as a statistician, I should not. But then I remember that there are some statisticians working on extreme value theory, and I feel again at peace with myself.
8. Several studies are reporting that the mental health of graduate students is worsening. Yet, this is too often treated as taboo by all parties.