

Misspecification in financial econometric models

NES Research Project Proposal for 2014-2015

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This project focuses on the interesting and important issue of what consequences may various misspecifications in time series models have. It is pretty obvious that confusing some look-alike features of financial data may lead to serious changes in econometric modeling and further to drastic changes in implications of these models.

As an example, Bera and Higgins (1997) show that bilinearity in the mean equation can be erroneously perceived as ARCH effects. As another example, Carrasco (2002) analyzes, both analytically and numerically, how far confusion of one non-linear model class for another class (for instance, a Markov-switching model for a threshold model) can lead a researcher in her inferences. There are theoretical treatments, like Hall & Inoue (2003), that analyze consequences of misspecification.

In this project, however, we will do such analysis by a technically simpler way of simulation exercises with data generating processes calibrated to real financial data. It is interesting to know, for example, if missing an existing time varying risk premium in the mean model can lead to spurious findings of a leverage effect in the model for variance. Similarly, there is a question of how much misspecification in the GARCH equation is required in order to find spurious non-trivial dynamics in higher (3rd and 4th) order moments. In a multi-asset context, it is interesting to see what various popular multivariate GARCH models may imply for certain restricted specifications such as DCC or proximity-structured GARCH.

Students with interests in time series econometrics are invited to participate in the project. The themes described above are suggestive; some other econometric topics within the project leader's expertise are also possible. As an example, for a more ambitious student it may be interesting to make a multivariate extension of the decomposition model for financial returns (Anatolyev and Gospodinov, 2010).

The final target is producing high-quality research publishable in international journals.

References:

- Anatolyev, Stanislav and Gospodinov, Nikolay (2010). Modeling financial return dynamics via decomposition. *Journal of Business & Economic Statistics*, 28(2), 232–245.
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- Hall, Alastair R. and Inoue, Atsushi (2003). The large sample behaviour of the generalized method of moments estimator in misspecified models. *Journal of Econometrics*, 114(2), 361–394.