In Economics as in many other disciplines, one often use state-space models, ie that contain unobserved variables (solved DSGE models for instance). These representations are difficult to estimate because they are concerned by all the usual numerical problems related to estimation (size, slow calculations, local solutions, ...).

The one-step online approach has the double advantage of circumventing the usual numerical problems and providing efficient estimators. Nevertheless, these properties have been obtained for rather simple models and can not therefore be applied directly to more complex models such as state-space models.

The aim of the thesis is to extend this online estimation method to state-space models. An efficient and fast estimation of these models represents an important breakthrough, especially if it can be implemented transparently for a user. The developed method will also be implemented to macroeconomic or financial issues, using more complex and better specified models.

The thesis will include three objectives:

1. Generalize the properties of the estimators of the one-step online estimation method obtained for simple models in the case of state-space models. This first contribution will be original insofar as the one-step online method has never been applied to this category of models. In particular, we are interested in linear Gaussian model-state models and Markovian regime switching models, which are currently very popular and useful in the economic literature. The ease of implementation of this approach should ensure an international and multi-disciplinary interest in this method. Indeed, estimating such models currently requires very large computation times and multiple robustness exercises before using the estimated model.

2. Apply this method to economic or financial issues using better specified models. The second originality of our approach is that once the limit of the practical implementation of the estimation has been pushed back, it will be possible to improve the current models.

3. Extend the online method to non-Gaussian nonlinear models.

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