Referee Report on "Locally Time-Varying Parameter Regression"

May 16, 2023

1 Summary

In this paper, the author proposes a modeling framework (LTVP) along with the carefully designed MCMC sampling method that facilitates handling the variable selection and checking the detailed dynamic scheme of time-varying parameters in linear regressions. By treating both the time-varying parameters and latent variables indicating the frequency at which the parameters change as the parameters to be inferred from the posterior information based on the observed data, a nested MH-within-Gibbs sampler is exploited for making inferences.

2 Comments

In general, I think the paper is well-written. However, I have some personal suggestions for improving this paper along with some concerns regarding certain parts of the paper that I wish the author could clarify or discuss in greater length. All these are to be summarized as follows

2.1 Main Concerns

1. It would be better if the author could use notation more clearly. For instance, on page 9 at the beginning of section 3 for describing the detailed meaning of notation, I think it would be better to use letters in bold format for emphasizing data, i.e. $\mathbf{y} = \{y_t\}_{t=1}^n$. There are many other similar issues in the paper. Although all these are tiny issues that may not confuse the readers, the paper may be more in accordance with the standard writing style and notation system.

2. As additional evidence for validating the MCMC procedure, including trace plots or the corresponding diagnosis statistics of some representative parameters would be better to convince the readers of MCMC convergence.

3. Given that, essentially, the dynamic spike-and-slab priors are used for modeling, the proposed modeling framework would naturally have potential in variable selection, which to some extent can be regarded as one particular scenario of the TVP setting. I noticed that this may also be a target in this paper. Consequently, simulations and empirical applications of large or medium scale would be better. The author may consider the Monte Carlo experiment DGP or the corresponding alternatives in Koop and Korobilis (2023).

References

Koop, G. and Korobilis, D. (2023) Bayesian Dynamic Variable Selection in High Dimensions. *International Economic Review*, forthcoming.