

Corrigendum: Analysis of the forward search using some new results for martingales and empirical processes

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The proof of Theorem 4.1 in Johansen and Nielsen [2] (JN) is insufficient. The theorem is concerned with a weighted and marked empirical process for estimated residuals.

The problem arises in item 6 on page 1156. A function \mathcal{J}_i of b, c, x_{in} is considered. Gridpoints b_m, c_k are associated with b, c . Lemma B.2 shows that for each b, c, x_{in} there exists k^\dagger, k^\ddagger and a bound for \mathcal{J}_i depending on k, k^\dagger, k^\ddagger and which is therefore not uniform in b, c, x_{in} . Thus, the inequality in the last line on the page is insufficiently argued.

The solution is to replace the inequality in Lemma B.2 with another inequality that is uniform in b, c , while keeping track of x_{in} .

Berenguer-Rico, Johansen, and Nielsen [1] (BJN) considers the problem under a slightly different set of Assumptions. JN Assumption 4.1 has three parts. BJN show that part (i) on the density can be weakened; part (ii) on the maximum of the regressors is no longer needed; however, part (iii) on moments of regressors and weights has to be slightly strengthened to achieve this. We find that the new assumptions are easier to work with in applications. In particular, we can now allow densities with bounded support and explosive regressors.

It is hardly worthwhile to provide a correct proof for Theorem 4.1 in JN in the original formulation. But, BJN show that the results in JN are correct in the following way. Assumption 4.1(iii) should be replaced by $n^{-1} \mathbb{E} \sum_{i=1}^n (1 + |g_{in}|^{2r})(1 + |n^{1/2} N' x_i|^2) = O(1)$, where $|n^{1/2} N' x_i|$ is raised to the power 2 instead of 1. As a consequence, in Assumption 3.1 we should replace $q_0 = 1 + \max\{2^{r+1}, 2/(\eta - \kappa)\}$ by $q_0 = 1 + \max\{1 + 2^{r+1}, 2/(\eta - \kappa)\}$.

References

- [1] Berenguer-Rico, V., Johansen, S. and Nielsen, B. (2019). The analysis of marked and weighted empirical processes of estimated residuals. Discussion Paper 19-05, Department of Economics, University of Copenhagen.
- [2] Johansen, S. and Nielsen, B. (2016). Analysis of the forward search using some new results for martingales and empirical processes. *Bernoulli* 22 1131–1183. MR3449811

Received May 2019