Consistent sequential estimation of the number of breaks in trend

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Kejriwal and Perron (2010) proposed sequential testing for breaks in trend. This procedure requires break date estimators in order to apply sequential tests. However, it is documented in Yang (2017) that the trend break date estimators are inconsistent when the number of breaks is under-specified, unlike in the mean-shift case. This inconsistency leads to poor properties of the sequential testing. For example, if the break dates are sequentially estimated, this method may provide inconsistent estimation of the number of breaks. Moreover, even when the break dates are simultaneously estimated, the tests have low power when the presumed number of breaks is smaller than the true number of breaks.

In order to solve this problem, we propose a modified method to estimate the number of breaks and the break dates. It is shown that the proposed break date estimators are consistent, even when the number of breaks is under-specified. In addition, the proposed method yields consistent estimation of the number of breaks. Simulation results confirm the usefulness of the proposed method.

References

[1] Kejriwal, M. and P. Perron (2010) "A sequential procedure to determine the number of breaks in trend with an integrated or stationary noise component," *Journal of Time Series Analysis* 31, 305–328.

[2] Yang, J. (2017) "Consistency of trend break point estimator with underspecified break number," *Econometrics* 5(1), 4.