Optimal Forecast under Structural Breaks

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Abstract

This paper develops an optimal combined estimator to forecast out-of-sample under structural breaks. When it comes to forecasting, using only the post-break observations after the most recent break point may not be optimal. In this paper we propose a new estimation method that exploits the pre-break information. In particular, we show how to combine the estimator using the full-sample (i.e., both the pre-break and post-break data) and the estimator using only the post-break sample. The full-sample estimator is inconsistent when there is a break while it is efficient. The post-break estimator is consistent but inefficient. Hence, depending on the severity of the breaks, the full-sample estimator and the post-break estimator can be combined to balance the consistency and efficiency. We derive the Stein-like combined estimator of the full-sample and the post-break estimators, to balance the bias-variance trade-off. The combination weight depends on the break severity, which we measure by the Wu-Hausman statistic. We examine the properties of the proposed method, analytically in theory, numerically in simulation, and also empirically in forecasting real output growth across nine industrial economies.

Keywords: *Forecasting; Structural breaks; Stein-like combined estimator; Output growth.*

JEL Classification: C13, C32, C53

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