Signed-rank Optimal Tests For random Effects in Panel Data

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Abstract

We consider the problem of detecting unmeasured heterogeneity in panel data, that is, the problem of testing the absence of random individual effects in a $n \times T$ panel. We establish local asymptotic normality property (LAN), when n tend to infinity and T is fixed. The tests we are proposing are based on signed ranks of the residuals. They are locally asymptotically optimal at correctly specified (symmetric) innovation densities. The limiting distribution of our test statistics is obtained both under the null and under sequences of contiguous alternatives. A local asymptotic linearity property is established in order to control for the effect of substituting estimated values for nuisance parameters. Local powers and asymptotic relative efficiencies with respect to the pseudo-Gaussian test are derived.

Key words and phrases : Random effects, panel data, signed ranks, local asymptotic normality.