Panel Unit Root Tests Under Cross Sectional Dependence

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Abstract

In this paper alternative approaches for testing the unit root hypothesis in panel data are considered. First, a robust version of the Dickey-Fuller t-statistic under contemporaneous correlated errors is suggested. Second, the GLS t-statistic is considered, which is based on the t-statistic of the transformed model. The asymptotic power of both tests against a sequence of local alternatives is compared. To adjust for short-run serial correlation of the errors, a pre-whitening procedure is suggested that yields a test statistic with a standard normal limiting distribution as N and T tends to infinity. The test procedure is further generalized to accommodate individual specific intercepts. From our Monte Carlo simulations it turns out that the robust OLS t-statistic performs well with respect to size and power, whereas the the GLS t-statistic may suffer from severe size distortions in small and moderate sample sizes. To improve the small sample properties of the GLS test procedure, a bootstrap version of the test is available.

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