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Semiparametric trending regression for unbalanced panel data with application to realized volatility

A methodology is outlined for developing a semiparametric panel data model to describe the realized volatility and the trend in monthly dataset of US equity returns by using the Center for Research in Security Prices (CRSP) while relinquishing the assumption of global stationarity. We allow the trend to evolve in a nonparametric way, with an unknown smooth function. While we first provide idiosyncratic trends for each individual i , we aim to test for the common trends assumption based on a measure of nonparametric goodness-of-fit test before imposing it. We propose a semiparametric profile likelihood approach to estimate the model. We assume an asymptotic framework in which T is large; but not necessarily N .