

Prediction has long been a vibrant topic in modern probability and statistics. In addition to finding optimal forecast and model selection, it is argued in this paper that the prediction principle can also be used to analyze critical phenomena, in particular, stationary and unstable time series. Although the notion of nearly unstable models has become one of the important concepts in time series econometrics, its role from a prediction perspective is less developed. Based on moment bounds for the extreme-value (EV) and least squares (LS) estimates, asymptotic expressions for the mean squared prediction errors (MSPE) of the EV and LS predictors are obtained for a nearly unstable first-order autoregressive (AR(1)) model with positive error. These asymptotic expressions are further extended to a general class of nearly unstable models, thereby allowing one to understand to what degree such general models can be used to establish a link between stationary and unstable models from a prediction perspective. As applications, we illustrate the usefulness of these results in conducting finite sample approximations of the MSPE for near unit-root time series.