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BOOK OF ABSTRACTS

are easily and consistently estimated by replacing the unknown expectations of check loss function by their nonparametric kernel estimates. We derive the Bahadur representation of the nonparametric estimator of the measures, which we use to establish the consistency. We also provide the asymptote distribution of the estimator of the measure, which we use to build tests for their statistical significance and we study its properties under some local alternatives. We establish the validity of smoothed local bootstrap that one can use in finite sample settings to perform statistical tests. Monte Carlo simulations reveal that the proposed test has good finite sample size and power properties for a variety of data-generating processes and different sample sizes. Finally, the empirical importance of measuring nonlinear causality in quantile is also illustrated. We quantify the degree of nonlinear predictability of equity risk premium using variance risk premium, unemployment, inflation, and effective federal funds rate. Our empirical results show that the variance risk premium and effective federal funds rate are a good predictor of the quantiles of risk premium. The variance risk premium is able to predict both the centre and the lower and upper quantiles of the distribution of stock returns, whereas effective federal funds rate only helps to predict the lower and upper quantiles without any effect on the centre of distribution. Finally, the macro variables such as unemployment and inflation have no effect on the quantiles (distribution) of stock returns.

Keywords: Measures of Granger causality; Granger causality in quantiles; Conditional quantile function; Time series; Local linear estimator; Smoothed local bootstrap.

2.220 On making use of presumed values of a linear functional in its statistical estimation

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Abstract: Methodology and techniques of usage of supplementary a priori information about the statistically estimated functional of unknown probability distribution in nonparametric setting were considered in [1], [2]. The additional information may be received from different sources and may have diverse relations to the underlying distribution (e.g. theoretical predictions, results of previous experiments and/or computer modeling of other manifestations of the same distribution, etc.). This paper considers a case when the supplementary information is an expert's imagination about the value to be estimated, made by guess based on his knowledge and experience. Let us call such information a priory guess. The problem was how to improve the quality of statistical inference by combining this information with a sample data during its processing. A solution to this problem for the case of a single guess was presented in [3], [4], [5] in a form of the 'combined' estimate of the functional. Now, in this paper, an approach to solving this problem in nonparametric case by combining sample (a posteriori) information with several (a priori) guesses is considered. The adaptive estimates of the functional are constructed, that are converging (in the minimal mean-square error sense) with growing size of a sample to the optimal ones. The conditions are defined under which the adaptive estimate demonstrates better MSE than traditional nonparametric estimate. Some numerical examples are given that illustrate interdependence between number of guesses, their deviations from real value of the functional, and probabilistic characteristics of the estimate.

Keywords: Linear functional; A priori information; Prior guess; Combined estimator; Nonparametric adaptive estimation.

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