

Spline-backfitted kernel smoothing of additive coefficient model

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Abstract: Additive coefficient model (Xue and Yang 2006a, b) is a flexible tool for multivariate regression and time series analysis that circumvents the “curse of dimensionality.” We propose spline-backfitted kernel (SBK) and spline-backfitted local linear (SBLL) estimators for the component functions in the additive coefficient model that is both (i) computationally expedient so it is usable for analyzing very high dimensional data, and (ii) theoretically reliable so inference can be made on the component functions with confidence. In addition, it is (iii) intuitively appealing so it does not intimidate practitioners. Simulation experiments have provided strong evidence that corroborates with the asymptotic theory. The SBLL procedure is applied to a varying coefficient extension of the Cobb-Douglas model for the US GDP that allows non neutral effects of the R&D on capital and labor as well as in the Total Factor Productivity (TFP).