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Robust functional estimation in the multivariate partial linear model

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Abstract We consider the problem of adaptive estimation of the functional component in a partial linear model where the argument of the function is defined on a q-dimensional grid. Obtaining an adaptive estimator of this functional component is an important practical problem in econometrics where exact distributions of random errors and the parametric component are mostly unknown. An estimator of the functional component that is adaptive over the wide range of multivariate Besov classes and robust to a wide choice of distributions of the linear component and random errors is constructed. It is also shown that the same estimator is locally adaptive over the same range of Besov classes and robust over large collections of distributions of the linear component and random errors as well. At any fixed point, this estimator attains a local adaptive minimax rate.

Keywords Multivariate Besov space · Median · Adaptive estimation · Robust estimation · Multivariate partial linear model

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