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Injectivity of a Class of Integral Operators with Compactly Supported Kernels

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Abstract

Injectivity of integral operators is related to completeness conditions of their corresponding kernel functions. Completeness provides a useful way of obtaining nonparametric identification in various models including nonparametric regression models with instrumental variables, nonclassical measurement error models, and auction models, etc. However, the condition is quite abstract for empirical work and lacks a proper economic interpretation. We rely on known results regarding the Volterra equation to provide sufficient conditions for completeness conditions for densities with compact support. Our conditions include various smoothness assumptions and monotonously moving support assumptions on the kernel function of the operator. We apply our results to establish nonparametric identification in nonparametric IV regression models, nonclassical measurement error models, and auction models with an accessible interpretation and without specific functional form restrictions.

Keywords: *nonparametric identification, instrumental variable, completeness, endogeneity.*

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