

Testing Monotonicity in Unobservables with Panel Data*

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Abstract

Monotonicity in a scalar unobservable is a crucial identifying assumption for an important class of nonparametric structural models accommodating unobserved heterogeneity. Tests for this monotonicity have previously been unavailable. This paper proposes and analyzes tests for scalar monotonicity using panel data for structures with and without time-varying unobservables, either partially or fully nonseparable between observables and unobservables. Our nonparametric tests are computationally straightforward, have well behaved limiting distributions under the null, are consistent against precisely specified alternatives, and have standard local power properties. We provide straightforward bootstrap methods for inference. Some Monte Carlo experiments show that, for empirically relevant sample sizes, these reasonably control the level of the test, and that our tests have useful power. We apply our tests to study asset returns and demand for ready-to-eat cereals.

Keywords: monotonicity, nonparametric, nonseparable, specification test, unobserved heterogeneity

JEL Classification: C12, C14, C33.

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