

Identifying Causal Effects of Treatments with Variable Intensity using Multiple Instrumental Variables

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Abstract

This paper addresses the challenge of identifying causal effects of discrete, ordered treatments with multiple binary instruments. I show that a weighted average of local average treatment effects for combined complier populations is identified under the limited monotonicity assumption. The proposed estimand offers intuitive weights and encompasses a large complier population, presenting an appealing alternative to the conventional two-stage least squares estimand. I provide explicit formulas for the weighting function. These formulas give rise to necessary conditions that provide testable implications for the limited monotonicity assumption. I demonstrate how causal forests can be employed to detect local violations of this assumption. The methodology is applied to study the impact of community nurseries on child health outcomes.

Keywords: Variable treatment intensity, Average Causal Response, multiple instruments, specification tests.

JEL classification: C14, C21, C26.

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