

Contents

1	Introduction	1
	References	4
2	Econometric Framework	7
2.1	Basic Notation and Parameter of Interest	7
2.2	The Endogeneity Problem and Partial Identification of the <i>ATE</i>	8
2.3	Additional Notation	11
	References	11
3	Bounds Under Different Identification Assumptions	13
3.1	Manski's Bounds	13
3.1.1	Bounds Under Manski's Assumptions	14
3.1.2	Bounds Under the Relaxed MTR and MTS Assumptions	17
3.2	Bounds Based on Threshold Crossing Models	18
3.2.1	Bounds in Heckman and Vytlačil (1999, 2000)	19
3.2.2	Bounds in Shaikh and Vytlačil (2005, 2011)	21
3.3	Bounds Based on the Local Average Treatment Effect Framework	25
3.3.1	Bounds in Chen et al. (2018)	25
3.3.2	Bounds in Huber et al. (2017)	32
3.3.3	Bounds in Balke and Pearl (1994, 1997)	36
	References	39

4	Comparison of Bounds Across Different Assumptions	41
4.1	Manski's Approach Versus Threshold Crossing Models	41
4.1.1	Manski's Approach Versus Threshold Crossing Model on the Treatment	42
4.1.2	Manski's Approach Versus Joint Threshold Crossing Models	42
4.1.3	Manski's Approach Versus Threshold Crossing Model on the Outcome	46
4.2	The <i>LATE</i> Framework Versus the Two Other Approaches	48
4.2.1	Kitagawa (2009) and Hahn (2010)	48
4.2.2	Huber et al. (2017) and Chen et al. (2018)	49
4.3	Summary of the Identification Power of Different Assumptions	52
	References	53
5	Assessment of Validity of Different Assumptions	55
5.1	Assessment Based on Threshold Crossing Models	56
5.1.1	Assessment of the Threshold Crossing Model on the Treatment	57
5.1.2	Assessment of the Rank Similarity Assumption	58
5.2	Assessment Based on the <i>LATE</i> Framework	60
5.2.1	Assessment of the <i>LATE</i> Assumptions	61
5.2.2	Assessment of the Mean Dominance Assumption Across Strata	69
	References	73
6	Estimation and Inference	75
6.1	Confidence Intervals for the Parameter: Imbens and Manski (2004)	76
6.2	Intersection Bounds: Chernozhukov et al. (2013)	80
	References	83
7	Empirical Applications of Bounds	85
7.1	Empirical Applications Using Manski and Pepper's (2000) Assumptions	87
7.2	Empirical Applications Using Threshold Crossing Models	90
7.3	Empirical Applications Using <i>LATE</i> Framework	91
7.4	Other Empirical Applications	94
	References	96
8	Conclusion	99
	References	102

Abstract

This book reviews recent approaches for partial identification of average treatment effects with instrumental variables in the program evaluation literature, including Manski's bounds, bounds based on threshold crossing models, and bounds based on the local average treatment effect (LATE) framework. It compares these bounds across different sets of assumptions, surveys relevant methods to assess the validity of these assumptions, and discusses estimation and inference methods for the bounds. The book also reviews some empirical applications employing bounds in the program evaluation literature. It aims to bridge the gap between the econometric theory on which the different bounds are based and their empirical application to program evaluation.