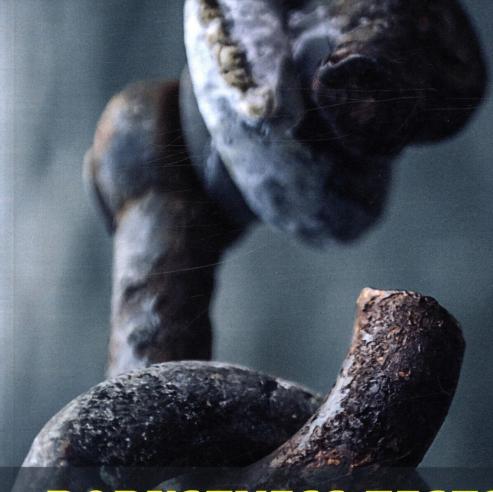
Methodological Tools in the Social Sciences



# ROBUSTNESS TESTS FOR QUANTITATIVE RESEARCH

Eric Neumayer and Thomas Plümper

"Neumayer and Plümper have made an impressive contribution to research methodology. Rich in innovation and insight, *Robustness Tests* for *Quantitative Research* shows social scientists the way forward for improving the quality of inference with observational data. A must-read!"

Harold D. Clarke, Ashbel Smith Professor, University of Texas at Dallas

The uncertainty researchers face in specifying their estimation model threatens the validity of their inferences. In regression analyses of observational data the "true model" remains unknown and researchers face a choice between plausible alternative specifications. Robustness testing allows researchers to explore the stability of their main estimates to plausible variations in model specifications. This highly accessible book presents the logic of robustness testing, provides an operational definition of robustness that can be applied in all quantitative research and introduces readers to diverse types of robustness tests. Focusing on each dimension of model uncertainty in separate chapters, the authors provide a systematic overview of existing tests and develop many new ones. Whether it be uncertainty about the population or sample, measurement, the set of explanatory variables and their functional form, causal or temporal heterogeneity, effect dynamics or spatial dependence, this book provides guidance and offers tests that researchers from across the social sciences can employ in their own research.

**Eric Neumayer** is Professor of Environment and Development and Pro-Director Faculty Development at the London School of Economics and Political Science (LSE).

**Thomas Plümper** is Professor of Quantitative Social Research at the Vienna University of Economics and Business.

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# Robustness Tests for Quantitative Research

#### **Eric Neumayer**

London School of Economics and Political Science

#### Thomas Plümper

Vienna University of Economics and Business



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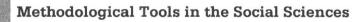
#### Robustness Tests for Quantitative Research

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ERIC NEUMAYER is Professor of Environment and Development and Pro-Director Faculty Development at the London School of Economics and Political Science (LSE).

THOMAS PLÜMPER is Professor of Quantitative Social Research at the Vienna University of Economics and Business.

Both authors have published in highly ranked journals including the American Journal of Public Health, Annals of the American Association of Geographers, International Organization, Political Analysis and World Development.



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The Methodological Tools in the Social Sciences series is comprised of accessible, stand-alone treatments of methodological topics encountered by social science researchers. The focus is on practical instruction for applying methods, for getting the methods right. The authors are leading researchers able to provide extensive examples of applications of the methods covered in each book. The books in the series strike a balance between the underlying theory and the implementation of the methods. They are accessible and discursive, and make technical code and data available to aid in replication and extension of the results, as well as enabling scholars to apply these methods to their own substantive problems. They also provide accessible advice on how to present results obtained from using the relevant methods.

### Acknowledgments

This book provides a systematic foundation and justification for robustness testing as a way to improve the validity of causal inferences based on regression analysis of observational data. We define and operationalize robustness, and we make it measureable on a scale that ranges from 0 to 1. Not every social scientist will like the fact that we institutionalize a term, and many will disagree with our definition of robustness. This is very much intended. Definitions are not correct, they can only be useful. We believe in the usefulness of our definition. The same goes for the large number of robustness tests that we propose in part 2 of the book.

We have come a long way since we began the robustness project in 2012. We were helped along by the fact that the UK's Economic and Social Research Council (ESRC) did not have a program of funding risky but potentially transformative research agendas and that corresponding research proposals were not likely to be accepted by the ESRC's standard review process. As a consequence, the ESRC established a funding scheme for potentially "transformative research" and invented a fundamentally different refereeing process in which UK universities were only allowed to submit up to two proposals. Our project was successfully submitted through the University of Essex, for which we thank its then Pro-Vice Chancellor Research, Professor David Sanders.

We presented parts and preliminary findings of the project on various occasions: the annual conferences of the European Political Science Association in 2012 (Berlin), 2013 (Barcelona), 2014 (Edinburgh), 2015 (Vienna), and 2016 (Brussels), the annual meetings of the American Political Science Association in 2014 (Washington D.C.) and 2015 (San Francisco), the PSA Quantitative Network Conference at the University of Oxford in 2015 (thanks to Steve Fisher and Andreas Murr for organizing the meeting and inviting our presentation). Our incredible friends in Texas were so kind as to give us the opportunity to present central concepts of the book at the University of Texas at Austin's Research Methodology Conference organized and hosted by Chris Wlezien. We thank Harold Clarke, Guy Whitten, Stephen Jessee, Bob Luskin, Tse-Min Lin, Chris Wlezien, Marianne Stewart, Zach Elkins, Mike Findley, Randy Stephenson, and Robert Moser for comments and stimulating discussions. We also thank Guy Whitten for

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# **Robustness Tests**

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	b) Excludes observations that may belong to population	
	c) Structured permutation variants	
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Core group test	Includes only cases known to be in the population	97
Outlier elimination test	Drops "outliers"	97
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	robustness limit variant	
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	robustness limit variant	
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Name	Action	Pages
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Name	Action	Pages
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