## An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model

Yoto V. Yotov, Roberta Piermartini, José-Antonio Monteiro, and Mario Larch







#### What is An Advanced Guide to Trade Policy Analysis?

An Advanced Guide to Trade Policy Analysis aims to help researchers and policymakers update their knowledge of quantitative economic methods and data sources for trade policy analysis.

#### Using this guide

The guide explains analytical techniques, reviews the data necessary for analysis and includes illustrative applications and exercises.

#### Find out more

Website: http://vi.unctad.org/tpa

### An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model

Aut	ho	rs		3		
	Ac	kno	owledgments	3		
Diso	cla	im	er	4		
Intr	ntroduction					
	A.	Th tra	e gravity model: a workhorse of applied international de analysis	5		
	B.	Us	ing this guide	6		
СН	AP AN	TE: JAI	R 1: PARTIAL EQUILIBRIUM TRADE POLICY YSIS WITH STRUCTURAL GRAVITY	9		
	A.	Ov	erview and learning objectives	11		
	B.	Ar	ledgments	12		
		1.	Structural gravity: from theory to empirics	12		
		2.	Gravity estimation: challenges, solutions and best practices	17		
		3.	Gravity estimates: interpretation and aggregation	28		
		4.	Gravity data: sources and limitations	32		
	C.	Ap	plications	40		
		1.	Traditional gravity estimates	41		
		2.	The "distance puzzle" resolved	45		
		3.	Regional trade agreements effects	49		
	D.	Ex	ercises	55		
		1.	Estimating the effects of the WTO accession	55		
		2.	Estimating the effects of unilateral trade policy	56		

Ap	Appendices		57	
	Aŗ	ppendix A: Structural gravity from supply side	57	
	Aŗ	Appendix B: Structural gravity with tariffs		
	Аŗ	opendix C: Databases and data sources links summary	63	
Chap st	ter ruc	2: General equilibrium trade policy analysis with tural gravity	67	
A.	70	verview and learning objectives	69	
B.	Ar	nalytical tools	70	
	1.	Structural gravity: general equilibrium context	70	
	2.	Standard approach to general equilibrium analysis with structural gravity	88	
	3.	A general equilibrium gravity analysis with the Poisson Pseudo Maximum Likelihood (GEPPML)	95	
C.	Аŗ	oplications	102	
	1.	Trade without borders	103	
	2.	Impact of regional trade agreements	111	
D.	Еx	rercises	117	
	1.	Calculating the general equilibrium impacts of removing a specific border	117	
	2.	Calculating the general equilibrium impacts of a regional trade agreement	118	
Ap	Appendices			
	Аţ	opendix A: Counterfactual analysis using supply-side gravity framework	119	
	Appendix B: Structural gravity with sectors		121	
	Aŗ	opendix C: Structural gravity system in changes	126	
Refer	enc	es	131	

### **AUTHORS**

Yoto V. Yotov Drexel University, CESifo and ERI-BAS

**Roberta Piermartini** Economic Research and Statistics Division, World Trade Organization

#### José-Antonio Monteiro

Economic Research and Statistics Division, World Trade Organization

#### Mario Larch

University of Bayreuth, CESifo, ifo Institute, and GEP at University of Nottingham

### Acknowledgments

The authors would like to thank Michela Esposito for her comments and valuable research assistance. They also would like to thank Delina Agnosteva, James Anderson, Richard Barnett, Davin Chor, Gabriel Felbermayr, Benedikt Heid, Russell Hillberry, Lou Jing, Ma Lin, Antonella Liberatore, Andreas Maurer, Jurgen Richtering, Stela Rubinova, Serge Shikher, Costas Syropoulos, Robert Teh, Thomas Verbeet, Mykyta Vesselovsky, Joschka Wanner, Thomas Zylkin, as well as the seminar and workshop participants at the ifo Institute, the World Trade Organization, the World Bank, the U.S. International Trade Commission, Global Affairs Canada, the University of Ottawa, the Kiel Institute for the World Economy, the Tsenov Academy of Economics, and the National University of Singapore for helpful suggestions and discussions. Thanks also go to Vlasta Macku (UNCTAD Virtual Institute) for her continuous support to this project and her role in initiating this inter-organizational cooperation.

The production of this book was managed by WTO Publications. Anthony Martin has edited the text. The website was developed by Susana Olivares.

The designations employed in UNCTAD and WTO publications, which are in conformity with United Nations practice, and the presentation of material therein do not imply the expression of any opinion whatsoever on the part of the United Nations Conference on Trade and Development or the World Trade Organization concerning the legal status of any country, area or territory or of its authorities, or concerning the delimitation of its frontiers. The responsibility for opinions expressed in studies and other contributions rests solely with their authors, and publication does not constitute an endorsement by the United Nations Conference on Trade and Development or the World Trade Organization of the opinions expressed. Reference to names of firms and commercial products and processes does not imply their endorsement by the United Nations Conference on Trade and Development or the World Trade Organization of the opinions expressed. Reference to names of firms and commercial products and processes does not imply their endorsement by the United Nations Conference on Trade and Development or the World Trade Organization of the opinions expressed. Reference to names of firms and commercial products and processes does not imply their endorsement by the United Nations Conference on Trade and Development or the World Trade Organization, and any failure to mention a particular firm, commercial product or process is not a sign of disapproval.

# A. The gravity model: a workhorse of applied international trade analysis

Quantitative and detailed trade policy information and analysis are more necessary now than they have ever been. In recent years, globalization and, more specifically, trade opening have become increasingly contentious. It is, therefore, important for policy-makers and other trade policy stakeholders to have access to detailed, reliable information and analysis on the effects of trade policies, as this information is needed at different stages of the policy-making process.

Often referred to as the workhorse in international trade, the gravity model is one of the most popular and successful frameworks in economics. Hundreds of papers have used the gravity equation to study and quantify the effects of various determinants of international trade. There are at least five compelling arguments that, in combination, may explain the remarkable success and popularity of the gravity model.

- First, the gravity model of trade is **very intuitive**. Using the metaphor of Newton's Law of Universal Gravitation, the gravity model of trade predicts that international trade (gravitational force) between two countries (objects) is directly proportional to the product of their sizes (masses) and inversely proportional to the trade frictions (the square of distance) between them.
- Second, the gravity model of trade is a **structural model with solid theoretical foundations**. This property makes the gravity framework particularly appropriate for counterfactual analysis, such as quantifying the effects of trade policy.
- Third, the gravity model represents a **realistic general equilibrium environment** that simultaneously accommodates multiple countries, multiple sectors, and even firms. As such, the gravity framework can be used to capture the possibility that markets (sectors, countries, etc.) are linked and that trade policy changes in one market will trigger ripple effects in the rest of the world.

## 预览已结束, 完整报告链接和二维码

https://www.yunbaogao.cn/report/index/report?reportId=5