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# Models of Economic Geography Dynamics, Estimation and Policy Evaluation

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## Models of Economic Geography: *Dynamics, Estimation and Policy Evaluation*

#### Proefschrift

ter verkrijging van het doctoraat in de Economische Wetenschappen aan de Rijksuniversiteit Groningen op gezag van de Rector Magnificus, dr. F. Zwarts, in het openbaar te verdedigen op donderdag 1 april 2004 om 16.15 uur

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Thijs Knaap

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Beoordelingscommissie: Prof. dr. J. V. Henderson

Prof. dr. J.P. Neary Prof. dr. J. Oosterhaven

### Acknowledgements

Work on this thesis started in 1996, when I was appointed to the department of economics at Groningen University. The project has continued much longer than any of the original participants must have thought, but I think it has now come to a satisfying conclusion.

After using eight years to write this relatively small book, I think I owe the public some explanation about how the time on this project was spent. I left Groningen late 2000 after completing the research that was to become chapter 6 of this thesis. The manuscript still had a number of loose ends, which I intended to tie up quickly.

As these things go, however, I was soon torn between two interesting projects: while my new job took off, theoretical complications that I had not foreseen turned up in several chapters of this book. Lacking the time to fix things once and for all, I soon became the owner of an interesting collection of missed deadlines. Fortunately, time was partly on my side. I came across a new paper by Redding and Venables in the summer of 2002 in which I found the missing idea for chapter 5. Dutch speakers will appreciate the fact that this paper saved my thesis. If I add that my experience in Rotterdam allowed me to improve the general-equilibrium models in this book I hope that the long time to completion is accounted for.

As with any drawn-out project, a large number of people have been instrumental to its completion. By naming a few of them here, I run the risk of neglecting others. For this I apologize beforehand.

I thank Steven Brakman for suggesting the project and subsequently allowing it to take a number of surprising turns. Our many discussions on the subject have been interesting and taught me a thing or two about keeping an eye on the subject while cutting the right corners. I further thank Catrinus Jepma for supervising the project and tirelessly reading manuscript after manuscript, suggesting many valuable improvements along the way. Both my promotors have shown an extraordinary amount of confidence in my abilities, and I hope that I have not let them down. Simon Kuipers contributed much to the smooth start of this project and involved me in many department activities, for which I am grateful. His valuable suggestions have especially improved chapters 2 and 3.

The members of my commission have certainly behaved above and be-

yond the call of duty. Professor Vernon Henderson showed remarkable hospitality by letting me visit Brown University for two wonderful months while I worked on chapter 5 in early 2000. The visit allowed me access to people and data that I could not otherwise have had, while exposing me to the interesting experience of winter in Rhode Island. Professor J. Peter Neary spotted a few glaring omissions and offered a large number of suggestions that have greatly improved the manuscript in its final stages. His careful reading of the entire book is appreciated. With Jan Oosterhaven I spent the summer of 2000 on the project that led to chapter 6. Working night and day to finish our model proved a good lesson in efficiency and dedication. However, the most valuable lesson came after those warm months and showed me the value of caring for your model once the computations are done. Without Jan's neverending enthusiasm, the results in chapter 6 might not have been given the attention they deserved.

Other people have directly contributed to this project, and I thank them for their work: Gordon Hanson kindly looked at a draft of chapter 5 in its early stages. Duncan Black supplied much of the data for that chapter. Ward Romp made figure 6.2. Piet Rietveld commented extensively on the original research proposal. As usual, the blame for any harm caused by this book falls on me alone.

While a graduate student, my work was made easier by the courses and workshops offered by the Dutch network of general and quantitative economics, NAKE. I gratefully acknowledge the help I received from many of its participants.

During recent years, my colleagues at Erasmus University repeatedly allowed me to take time off in order to finish this book. At the same time, their insights into general equilibrium modelling made it much better. I therefore include Leon Bettendorf, Lans Bovenberg, Peter Broer and Ben Heijdra here and thank them for their patience.

Whether I was a student, a faculty member or someone with a thesis to hand in, the department of Economics in Groningen has always treated me well. A special mention goes to my roommates Hakan Yetkiner and Marco Haan, my colleagues in International Economics, to the best computer services department in the world, to Philipp Maier for running a marathon with me, and to Steven Brakman, Ruud Koning, Elmer Sterken and Cees Sterks for accompanying me on various other distances.

Finally, all this work would not have been possible without the support and encouragement of those I hold dear: I thank my parents for their unconditional faith in my abilities and I especially thank Marianne Scholtens, who was there from start to finish, and I promise to honor her claim to the free time that now hopefully befalls me.

### **Contents**

Li	st of	Tables		xi
Li	st of	Figures	•	xiii
1	Introduction			1
	1.1	The p	urpose of this book	1
	1.2	The fi	nal frontier	3
	1.3	Outlir	ne	6
2	Con	npleme	entarities in growth and location theories	9
	2.1	Introd	luction	9
	2.2	Comp	elementarities and the monopolistic competition frame-	
		work		12
		2.2.1	Returns to scale	14
		2.2.2	Monopolistic competition	16
		2.2.3	Complementarities	18
		2.2.4	Review, and a look ahead	20
	2.3	Econo	omic geography	20
		2.3.1	Exogenous agglomeration	20
		2.3.2	Endogenous agglomeration	21
		2.3.3	The CP model and the home market effect	24
		2.3.4	Three channels in the CP model	26
		2.3.5	Conclusion	29
	2.4	Endog	genous growth theory	30
		2.4.1	Neoclassical and endogenous models of accumulation	. 31
		2.4.2	Growth through innovation	37
		2.4.3	Empirical tests	40
		2.4.4	Review	41
	2.5	Dynai	mic economic geography	41
		2.5.1	Agglomeration through local knowledge spillovers .	42
		2.5.2	Agglomeration through the R&D sector	44
		2.5.3	Agglomeration through the labor market	45
		2.5.4	Other models of growth and geography	45

viii Contents

	2.6	Conclusions
	2.A	A continuum of goods 48
	2.B	The home market effect
	2.C	The break and sustain point
3	A m	odel with continuous sectors 55
	3.1	Generalized Monopolistic Competition
		3.1.1 An example
	3.2	A two-sector model of economic geography 62
		3.2.1 Sectors that only use their own product 63
		3.2.2 Other IO patterns
	3.3	Location, sectors and economic growth 68
		3.3.1 Introduction
		3.3.2 The spatial equilibrium
		3.3.3 Growth
	3.4	Conclusion
	3.A	Firm demand and supply
4	Inp	it-output relations in economic geography 79
	$4.1^{-1}$	Introduction
		4.1.1 Related theory
		4.1.2 Intermediate goods, trade, and ties between industries 81
		4.1.3 Plan for the chapter
	4.2	The Venables model, and an extension with discrete sectors . 85
		4.2.1 One industrial sector 85
		4.2.2 Types and determinants of equilibrium 92
		4.2.3 A model with discrete sectors
		4.2.4 Solving the model
	4.3	Types of solutions
		4.3.1 A Taxonomy
		4.3.2 Stability of equilibria
	4.4	Conclusions
5	Esti	nation of parameters 107
J	5.1	Introduction
	5.2	Estimation in the literature
	·-	5.2.1 Measuring the home market effect
		5.2.2 Estimating a spatial wage structure
		5.2.3 Model calibration
	5.3	Vertically linked industries and agglomeration
	5.4	Data
	5.5	Estimation
	0.0	5.5.1 The Redding-Venables approach
		5.5.2 General equilibrium estimation
		J.J. General equilibrium estillation

Contents	ix

	5.6	Evaluating counterfactuals	
		5.6.1 A wage shock	. 140
		5.6.2 A fall in transport costs	
	5.7	Conclusions	. 143
	5.A	Data	. 144
6	Eval	uating a new Dutch railway link	157
	6.1	Introduction	. 157
	6.2	The Model	
		6.2.1 Production and Utility	
		6.2.2 The Labor Market	
		6.2.3 Transport Costs and Prices	
		6.2.4 Computation	
	6.3	Estimation and Calibration	
		6.3.1 Procedure and Data	. 164
		6.3.2 Problems with the estimation	
		6.3.3 Estimation results	
		6.3.4 Calibration	
	6.4	Simulation Results	
		6.4.1 Some remarks	. 169
		6.4.2 Endogenous number of varieties	
		6.4.3 Figures	
	6.5	Evaluation	
	6.6	Conclusion	
	6.A	Data and Conventions	
		6.A.1 Division of the Economy	
		6.A.2 Available Data	
		6.A.3 Other Coefficients	
	6.B	Derivations	
		6.B.1 Costs and Production functions	
		6.B.2 The number of firms	
-	C		101
7		mary and conclusions	<b>18</b> 1
	7.1	Summary	
	7.2	Conclusions	. 185
Bi	bliog	raphy	189
Samenvatting			

x Contents

## **List of Tables**

1.1	tivity on different scales	2
5.1	Gravity equations	120
5.2	Panel estimates for the gravity trade equation	146
5.3	Market Access and wage levels	147
5.4	Supplier Access and wage levels	149
5.5	Exogenous amenities, Market Access and wage levels	150
5.6	Instrumental variables estimation	151
5.7	Factor shares in US production, 1997	152
5.8	General equilibrium estimation results	153
5.9	Effects of a 10% decrease in Illinois wages	155
5.10	Effects of a 50% decrease in of transport costs between Illi-	
	nois and Indiana	156
6.1	Estimates of the unknown parameters $\Gamma$ as obtained from a	
	non-linear least squares procedure	167
6.2	The change in employment in two cities after a project, in seven iterations of the model. The number of firms varies	
	endogenously	170
6.3	Change in the number of jobs per region after each of five	170
0.5	project alternatives	171
6.4	Change in the price index of consumption for the average	
	consumer	171
6.5	The fourteen different sectors in the economy	174
6.6	Six scenarios for travel time in 2020, each with a different	
	infrastructural prject completed	176
6.7	Exogenous coefficients for each sector	177

## **List of Figures**

1.1	A nighttime picture of London	5
2.1	GDP per capita in the Netherlands	10
2.2	Gross regional product for twelve Dutch provinces	11
2.3	Direction of motion of $k$ in two models of growth	32
2.4	A box-arrow sketch of the two-sector model	33
3.1	Function $f(x)$ in formula (3.13) mapped out	60
3.2	Function $f(x)$ in formula (3.17) mapped out	62
3.3	Sector 1 preferable region	64
3.4	Sector 2 preferable region	65
3.5	Direction of motion in the $(m_1, m_2)$ plane	65
3.6	Dynamics when $\tau = 0.2$	66
3.7	The function $f(x)$ in formula (3.19) mapped out	67
3.8	Direction of motion when sector 1 uses all output as inter-	
	mediate, sector 2 uses only sector 2 output	67
3.9	The function $f(x)$ in formula (3.20) mapped out	68
3.10	The direction of motion when sectors use each others output	
	as intermediate input.	69
3.11	Function $f(x)$ , as defined in formula (3.21)	70
3.12	Function $f(x)$ , defined in formula (3.21), when the number	
	of firms grows from $n$ to $n + \delta$	74
4.1	Trade data for Germany in 1999, from and to OECD- and	
	non-OECD countries	82
4.2	Section 7 trade between the Netherlands and Germany	84
4.3	Two lines that indicate the stability of two equilibria as a	
	function of transport costs $\tau$	90
4.4	Stability as a function of transport costs $\tau$ when $\beta = 1$	93
4.5	Stability when $\psi=0.1$ and labor is more expensive than	
	intermediate products	95
4.6	Stability when $\psi=2.8$ and intermediate products are more	
	expensive than labor	95

xiv LIST OF FIGURES

4.7	Stability when $\psi = 20$ and intermediate products are much	
	more expensive than labor	95
4.8	A closeup look at figure 4.6	95
4.9	The four types of equilibrium, stylized	102
4.10	Stability map for all possible IO-matrices	103
4.11	A trip along the diagonal of the 'map figure'	104
4.12	Stability map for all IO-matrices, different parameters	105
5.1	The 48 contiguous states in the US	121
5.2	Predicted Market Access versus log wages for 48 states	148
5.3	Predicted Foreign M.A. versus log wages for 48 states	148
5.4	Distribution of the angle between the two vectors $dT/d\sigma$ and	
	$dT/d\tau$	152
5.5	MC distribution of $\hat{\sigma}$ , 'export' estimation, $1/40$ errors	154
5.6	MC distribution of $\hat{\tau}$ , 'export' estimation, $1/40$ errors	154
5.7	MC distribution of $\hat{\delta}$ , 'export' estimation, $1/40$ errors	154
6.1	Predicted log-trade versus actual log-trade	167
6.2	The effect of the six scenarios on the number of jobs in each	
	COROP region.	179