Book Review
The Gravity Model in International Trade.
Advances and Applications

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The gravity model has been used extensively in the international trade literature over the past 50 years.[1] This volume offers 11 papers, presented at a University of Groningen conference in October 2007, and written by authors who have made seminal contributions to the gravity model over the past decade or so. It is an enjoyable collection of research that takes the gravity model to new frontiers by examining its methodology, its assumptions and its applications.

The gravity model was first applied by Tinbergen (1962) and Pöyhönen (1963) who proposed that bilateral trade flows between two countries is positively related to their respective national incomes and negatively related to the bilateral distance between them. The estimable form of this equation leads to the core gravity model which has gained popularity as it yields robust estimates. However, until recently the gravity model was "an intellectual orphan, unconnected to the rich family of economic theory" (Anderson, 2010). Most of the papers in this anthology incorporate new theoretical foundations of the gravity model leading to more accurate estimation and interpretation of the spatial relations.

The editors, in the introduction, present the gravity model's history, micro-foundations and empirical applications, and state that the aim of the book is to "take stock of recent advancements" on the theoretical and empirical side. Part I of the volume has four papers on the model's methodology, Part II has three papers on the spatial aspects, and Part III has four papers that show the versatility of the gravity model by applying it to international environmental arrangements, diplomatic relations, financial integration caused by mergers and acquisitions, and economic performance.

In Part I, Bergstrand and Egger develop a theoretical model that simultaneously estimates gravity equations of bilateral final goods trade, intermediate goods trade and foreign direct investment (FDI) flows. Their predicted theoretical propositions are empirically validated leading the authors to conclude that Ethier's (1982) intermediate-inputs approach is relevant in explaining actual patterns of bilateral intermediates outsourcing flows. Anderson extends the multilateral resistance terms in Anderson and van Wincoop (2003) by considering when seller's and buyer's incidence of trade costs is determined in an aggregate fashion whereby all shipments are made from and to a basket of commodities.

Any researcher who has tried to estimate unbiased gravity-equation coefficients with multilateral-resistance terms has usually had to choose between Anderson and van Wincoop's customized non-linear approach or the computationally easier fixed-effects

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estimation. Baier and Bergstrand provide a nice alternative method for providing "theoretically motivated general equilibrium comparative statics without estimating a non-linear system of equations" (p. 91). Bikker addresses the shortcoming of the traditional gravity model—that it cannot explain substitution between trade flows—by developing the extended gravity model (EGM) which allows this substitution. He uses 2005 trade data to show that the EGM model yields similar results to those by Anderson and van Wincoop (2003).

Part II covers the spatial aspects of the gravity model. Head and Mayer argue that the existing measure of distance, which is some form of "average" distance between internal trading partners, is not appropriate for distance within or between economies that are geographically dispersed. Introducing a measure of "effective distance" that incorporates trade flows at a more disaggregated level they find that the existing measures overestimate effective distances and more so for countries that are closer to each other. Since traditional distance measures overestimate within-nation distances more than between-nation distances, this leads to larger negative impact of borders and overestimation of adjacency effects. They find that their measure of distance leads to smaller but still positive estimates of border and adjacency effects.

Bosker and Garretson, using a sample of 97 countries in 1996, find that the specification of trade costs matters in new economic geography models. Möhlmann, Ederveen, de Groot, and Linders consider intangible barriers to trade such as institutional and cultural distance and extend Rauch (1999) to examine whether this affects trade differently across sectors or across product groups. They find that cultural distance decreases trade while institutional distance increases trade for homogenous goods traded in organized exchanges. However, cultural and institutional distance is statistically insignificant for differentiated goods suggesting that substitution between FDI and trade can help in explaining this result.

In Part III, Rose and Spiegel find that bilateral and multilateral environmental treaties lead to more international exchange of assets between treaty members. Looking at trade flows between 26 Organisation for Economic Co-operation and Development (OECD) economies and 30 transition economies, Afman and Maurel find that diplomatic missions by home countries leads to higher exports in the post-transition period. Brakman, Gaita, Garretsen, and van Marrewijk find that, when financial integration is considered, a lower distance leads to a higher value of mergers and acquisitions from trade liberalization. The distance effect grows stronger over time implying that economic integration is a local phenomenon. Finally, using four measures of geographical distance as well as transportation costs, Boulhol and Serres consider an augmented Solow growth model to find that much of the variation in gross domestic product per capita across the OECD countries can be explained by economic geography factors and to a lesser extent by transportation costs.

The chapters are a bit repetitive as each author presents the basics of the gravity model, and many reference Anderson and van Wincoop's (2003) seminal contribution in detail, but this is an excellent volume, a must-read, for all trade empiricists who plan to use the gravity model.

References

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Note

1. The gravity model's popularity can be seen, for example, in an EconLit search of "gravity model" which lists 953 published works.