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Handbook of Global Logistics

Transportation in International Supply Chains

Editor

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Preface

History

About 10 years ago, I began work on a special issue of *Transportation Research E*. The topic was “Global Logistics.” There were to be papers on Logistics in all sectors of the world, and on flows between those regions. That topic did come to pass; the special issue (Vol. 41, No. 6) was published in 2005. (See <http://authors.elsevier.com/sd/article/S1366554505000529>)

I noted (Bookbinder 2005), in my editorial at that time, that we published the best of the manuscripts submitted, after helping those authors to revise. But it was pretty naïve to expect the international balance I had sought, without soliciting articles from researchers in specific geographic areas.

Thus, the idea of the present edited volume was born. Rather than issue a “Call for papers” and hoping for the best, the book would consist strictly of chapters that had been *commissioned*. I designed a rough list of chapters that would include applications from every continent, plus attention to all the modes of transport pertinent to international shipments.

It was my good fortune that so many of the authors I contacted were interested in preparing a chapter. As he or she saw fit, each principal contributor chose one or more co-authors with whom to collaborate. Together we worked on refining the content of the respective chapters, often with the aid of the referees named below.

Subject Matter

Consider the title of this edited volume, *Global Logistics*, and its subtitle, *Transportation in International Supply Chains*. No difficulties arise, until one tries to define the key terms and their relationships!

More seriously, let us now discuss the sections of this book. The geographic divisions are self-explanatory.

Part I Logistics and Supply Chains in Asia

The first four chapters involve Asia, reflecting that continent's importance today and tomorrow. We begin with "Logistics in China." Professors Feng Chen and Chung-Yee Lee are there, on the ground. They summarize the current situation and present two case studies. The near-term prospects are highlighted. These include improved Chinese logistics infrastructure to support the shift of industrial activities from eastern to middle or western areas.

Chapters 2 and 3 concern, respectively, India and the Asia Pacific region. Compared to **Chap. 1**, the emphasis here is a little more specific. R.P. Sundarraj and Komal Kumari deal with Electronic Procurement Systems in India, and their influence on supply chain operations in that country. The authors report on several case studies of firms in which innovative Logistics enables a unique blend of Indian customs with modern business practices. In **Chap. 3**, Amrik Sohal and Shams Rahmen focus on the uses of 3PL services in the Asia Pacific. Through surveys and published results, the enhanced use of outsourcing in that sector of the world is related to the growth of Manufacturing and Logistics there.

Ruth Banomyong, in **Chap. 4**, considers the progress in economic integration of the Greater Mekong Sub-region (GMS). All or portions of the six countries have significant commercial interactions, whose growth will depend on enhanced Logistics within and between those nations. Detailed comparisons across the GMS are made for each transportation mode, and for the various economic corridors in the region.

Part II Logistics and Supply Chains in Latin America

Chapters 5 and 6 present important Operations Research applications, respectively in Argentina and Brazil. Gustavo Braier and Javier Marengo describe an optimization model for the Argentine sugar industry. They provide details on a software tool to manage the data and analyze multiple scenarios for sugar production and distribution by a major Argentinean firm. A brief summary is also given of Logistics in that country.

Hugo Yoshizaki et al. formulate and solve a model that combines water-based domestic container shipments in Brazil with international movements of containers destined to that country. Their results show increases in vessel capacity utilization and in the gross margin of the particular liner company. The latter benefit could be obtained despite volatile currencies. (Domestic services are quoted in Brazilian *Real*; long-distance freight rates are in US Dollars.)

Chapters 5 and 6 are thus examples of the good Operations Research applications that abound in Latin American Logistics. Paul Mant and I take this a step further in **Chap. 7**. We give a detailed survey of various analyses of Latin American supply chains. The point-of-view is that of articles published in the *research literature*, whether involving OR models or empirical research. The

papers are categorized by the country of application, the managerial issues, and the analytical approaches employed.

Part III Logistics and Supply Chains in Europe

The European Union, currently with 27 members, is not at all homogeneous. Indeed, only [Chap. 11](#) concerns an application in just a single country. [Chapters 8–10](#) deal with regional issues or comparisons further afield.

Britta Gammelgaard and Aseem Kinra discuss Logistics in the Oresund Region ([Chap. 8](#)). In that portion of Scandinavia, the national boundaries between Denmark and Sweden are blurred. Synergies that go beyond an individual country or government are created because the region targets emerging consumer needs around sustainability and macroeconomic competence. Harilaos Psaraftis et al., in [Chap. 9](#), present the importance and significance of “Green Corridors.” Such a corridor is characterized by a concentration of freight traffic between major hubs, and by relatively long distances of transport. They summarize an ongoing venture, entitled “Project SuperGreen,” involving 22 partners from 13 European countries that seeks to identify and promote such corridors for the surface transportation of goods throughout Europe.

Jean-Paul Rodrigue and Theo Notteboom ([Chap. 10](#)) compare Europe to North America along several dimensions. Containerized freight is important in “intermediacy,” i.e., in the linking of country pairs that would not be directly connected by water transportation service. Coastal and inland waterways, for example, exemplify differences in freight regionalism between North America and Europe.

[Chapter 11](#) concerns an eye-catching topic, the production of beer. Haldun Süral and co-authors model the redesign of that supply and distribution network for a particular brewery. They also give an overview of Turkish Logistics in general.

Part IV Logistics and Supply Chains in the Developing World

Arnold Maltz et al., in [Chap. 12](#), discuss the issues in the purchase of goods from Developing Countries. Those authors also present a case study that spans the US/Mexico border. The chapter’s theme is the interdependence between global sourcing and global logistics. Emerging markets perhaps lack infrastructure and capable logistics service providers. But key opportunities for growth are in those nations: ones that may look difficult now, but will likely bloom later.

[Chapter 13](#) pertains to the “last mile,” not for the delivery of products but for the delivery of Healthcare. The difficult conditions in Gambia required an innovative approach to transportation. Hau Lee et al. recount in an enthusiastic way the use of *motorcycles* by health care workers. Careful practices in vehicle acquisition and maintenance, spare parts inventory management, and in scheduling the visits of these workers are described. Those practices, plus motorcycle-related training for the healthcare workers, resulted in striking productivity improvements (e.g. number of health-visits made to remote areas).

Part V Transportation Modes and their (Land) Interfaces

International shipments often involve transport by air. In [Chap. 14](#), Aisling Reynolds-Feighan carefully compares the air freight networks through which those goods move. She identified the top five “freight-airports” in each of Asia, Europe, and North America, and the top ten freight carriers in each region. The networks of those main carriers are contrasted through intriguing visual displays. Important conclusions concern the future directions of the air freight industry and the role of integrated carriers.

Shipments that arrive at the main airport or seaport must still get to the “hinterlands.” Peter de Langen and Jan Fransoo ([Chap. 15](#)) describe the network and business models for such an application in the Netherlands. They present a nine-level framework for the activities in international transport and logistics, in which Barge Operators and Terminal Operating Companies are among the key players. The authors emphasize the concept of an *extended gate*, whereby an inland hub becomes the “virtual gate” of a deep sea terminal.

James Higginson studies in detail the various challenges that a (global) shipment must overcome in crossing a border. He concentrates in [Chap. 16](#) on the most important spots where (people or) freight can traverse between the United States and Canada, summarizing the statistical results published for specific crossings. James also reviews the academic literature on border crossings in general, and provides guidance on the OR modeling of border-related events and processes.

[Chapter 17](#) concerns those countries plus Mexico: Wilbert Wilhelm and collaborators analyze tradeoffs in an international supply chain linking the nations of the North American Free Trade Agreement (NAFTA). They study the connections between the choice of transportation mode, the siting of facilities in the network, and the costs to enable the flow of product.

Part VI Innovative Features and Recent Global Developments

The final four chapters of this volume describe novel approaches or newer application areas that are becoming prominent. I am certainly proud of the innovations represented by Parts I through V. But the material in Part VI is neither particular to one area of the world, nor are these chapters specialized to a single mode of transportation.

Serhan Duran and co-authors (all formerly or presently at Georgia Tech) deal with Humanitarian Logistics in [Chap. 18](#). A disaster can strike anywhere on the globe. The benefits of purchasing the required relief items ahead of time, and storing them in strategic locations, are analyzed.

Yossi Sheffi ([Chap. 19](#)) presents the case for Logistics-Intensive “Clusters.” A logistics park, or extensions thereof, enable firms that are customers or suppliers of services to one another, to locate nearby. This co-location facilitates regional growth, and enables those firms collectively to be more competitive in an international sense.

In [Chap. 20](#), Teodor Crainic and collaborators formulate and solve an optimization model for the grouping of orders in the context of global procurement. (This is in contrast to the typical shipment consolidation models, which are based on the grouping of “loads.”) The authors make the case for their approach, and estimate the benefits in an application for a client in the grocery-products industry.

Most references that an author would cite describe what “is,” or show how to improve a current system. Fewer publications deal with what could be or should be. But [Chap. 21](#) (“The Future”) attempts to do just that. Barry Prentice and I speculate on what the Logistics and Supply Chain universe may look like in 2025. Arguments are offered in support of various points-of-view, sometimes controversial ones. The book thus concludes with some food for thought.

Uses of the Book

Here are some remarks on how the present volume might be of benefit, and to whom. The geographical parts or sections of the book consist of chapters that are self-contained, yet can be the basis on which to begin a comparison of Logistics/SCM between countries in that region. That will occasionally take some *work* on behalf of the student or reader: Successive chapters, even in the given section, are not following a template! But those differences indicate the work required (by oneself or a professor) to perform a meaningful comparison.

As another example, particular issues or concepts recur throughout the volume. “Borders” is the clear focus of [Chap. 16](#). But Border issues are also important in [Chap. 4](#), for the various nations in the Greater Mekong Sub-region of Southeast Asia. And again in [Chaps. 17](#) and [8](#). Borders are prevalent in the former chapter because the model was applied in the context of a NAFTA supply chain. The latter is because of the obvious influence of the two countries, Denmark and Sweden, in the Oresund Region.

[Chapter 8](#) deals with the Oresund region of Scandinavia, in which a “Cluster” (treated in detail in [Chap. 19](#)) is formed by entities in the two distinct but adjacent nations. [Chapter 7](#) notes the advantages that clusters have brought to certain supply chains in Latin America.

Now consider the functions of transportation carriers, and the shippers and 3PLs with whom they work. The influence and decisions of shippers are present in every chapter: A supply chain exists to move the goods dispatched by shippers to be received by consignees (buyers). Similarly, the third party logistics providers and carriers recur in most chapters. But 3PLs are the obvious focus of [Chap. 3](#); carrier issues are prevalent in [Chaps. 6, 14](#) and [15](#).

[Chapters 10](#) and [15](#) (respectively on “intermediacy” and “hinterland transport”) contain multiple layers of relationships. I, for one, intend to try and flesh those out in the future!

Acknowledgments and Appreciation

Elsewhere in the front matter, we thank a number of the referees whose work improved the quality of the various chapters. Here, I wish to thank others who helped me overcome particular challenges.

Fred Hillier, the acquiring editor of the series of books that includes the present volume, persisted in encouraging me to undertake this project. I'm glad that he did.

Neil Levine of Springer offered valuable advice at several meetings along the way. Matthew Amboy of Springer has provided aid in some of the final details, furnishing assistance in a number of aspects of the publication process.

I have worked with Bev Rodgers at the University of Waterloo since 2003. (She probably feels that was the year we began work on this book!) Bev did the major word-processing tasks on the chapters I co-wrote. She was especially active in the initial reports to the nineteen corresponding authors; other communications with them and the publisher; and in preparing the edited versions of the chapters that we submitted to Springer. Without Bev Rodgers, I could not have completed this project.

Finally, let me thank my wife Susan and our daughters, Amy and Lisa, for their love and support.

Waterloo, ON, Canada, February 2012

Jim Bookbinder

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Referees

Every chapter in this volume was commissioned in advance. The review process thus differed from the “adversarial” one used by most journals. Some topics I felt comfortable to critique on my own, with the occasional consultation of an anonymous colleague.

Other chapters involved subject matter for which the following researchers provided detailed comments and suggestions. I am grateful for their help.

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