

Preface

1 Discontent with Traditional Theory

My training was in traditional international trade theory, which had been dominated for decades by the competitive, constant-returns general-equilibrium model. My first job out of graduate school was at the University of Western Ontario in Canada, where I found it hard to reconcile important aspects of the Canadian economy with what I had been taught and indeed with what I was teaching to students. The Canadian manufacturing sector included many large firms and was over 50 percent foreign owned. I discovered that, quite disjoint from international trade theory, there was another field that considered industrial organization aspects of trade and trade policy in partial-equilibrium and descriptive analysis. Here there were discussions of how policy influenced foreign ownership and attempts to measure the scale and market power inefficiencies caused by restrictive trade policies. Rather than consider trade liberalization, successive Canadian governments made clumsy attempts to restrict the foreign ownership generated by those trade barriers.

Our traditional theory of international trade left me ill-equipped to participate in the debate, so I began in the late 1970s to work on incorporating industrial organization aspects of industries into trade models. I wanted to maintain the general-equilibrium focus that is the great strength of trade theory. On the other hand, I wanted to give individual firms an important place in the theory and endogenize the location and ownership decisions that were obviously a crucial part of the story.

I searched the more formal international economics literature available at the time for guidance in this task. I was disappointed to find that direct investment and multinationals, if they were treated at all,

were viewed as just part of the theory of portfolio capital flows. The view was that capital, if unrestricted, flows from where it is abundant to where it is scarce, and that was more or less all there was to say. There was no notion that the determinants and consequences of direct investments differ in any important way from those of portfolio capital investments.

This bias was also profoundly visible in data sources. Much data existed on direct investment stocks and flows, but very little existed on what the multinational firms actually produced and traded. Multinationals were viewed as investment and capital-flow phenomena, and not as real production units in the economy. You could get detailed data on trade flows from one source, data on investment stocks and flows from another source, but no data on multinational affiliate production activities.

It took very little staring at the available statistics to realize that viewing multinationals and direct investment as part of capital theory was largely a mistake. The latter theory suggested that direct investment should flow primarily from capital-rich to capital-poor countries, but this is clearly not the case as we will discuss in chapter 1. The overwhelming bulk of direct investment flows both from and to the high-income, developed countries, and there is a high degree of cross-penetration by firms from these countries into each other's markets.

Furthermore, the sourcing of finances for direct investment are often geographically disjoint from the actual parent country. The decision about whether and where to build a foreign plant is quite separate from how and where to raise the financing for that plant. I began to believe that the former decision should be the focus of a new micro-economic approach to direct investment while the latter could remain part of the more traditional theory of capital flows.

This is how I began working in 1977 on what is now known as the industrial organization approach to trade. It later turned out that others were beginning to do so at the same time, but with a different and generally more U.S. focus. As a consequence of my Canadian experience, I was primarily interested in oligopoly models in which the degree of competition and production efficiency were endogenous. Folks working in the United States were more fascinated than those elsewhere by the monopolistic competition model, which is devoid of these scale and procompetitive effects and concentrates instead on product diversity. I was also interested from the beginning in multinationals, again from the Canadian experience, while there was virtu-

ally no interest in multinationals among my colleagues in U.S. universities. In fact, many of them turned to normative analysis in the mid-1980s, a branch of theory now known as “strategic trade policy.” The literature produced inevitably assumed single-plant nationally owned firms, despite the fact that the industries used to motivate the analysis were often dominated by multinationals.

After twenty years, I have to say that it has been a great journey, but it is time to wrap it up. This book is an attempt to do just that. Much in the book has been published previously, but I have spent a great deal of time rewriting and rearranging. With the benefit of hindsight, I believe that I have learned better ways to motivate and exposit key points, and better methods for integrating the disparate parts into a more unified and coherent theory. I hope this proves true.

2 Objectives

The purpose of this book is to present a microeconomic, general-equilibrium theory of multinational firms. This theory and its analytical constructions must pass several simple tests. First, it should be easily incorporated into the theory of international trade and existing general-equilibrium models of trade. I think of this book as an important extension and modernization of trade theory, not something that invalidates or displaces our traditional wisdom. In pursuing that objective, I try to build models that nest within the traditional industrial organization and factor proportions models. Second, the theoretical models must be consistent with important stylized facts about actual multinational activity. Thus the models must be able to generate outcomes in which, for example, there is a high degree of cross-investment and affiliate production among similar, high-income countries. Third, the theory should generate testable predictions and must survive more formal econometric testing.

3 What's In

The first part of the book is a series of models in which firms can choose a headquarters location that performs functions such as management, research and development, marketing, and finance. The firm also chooses the number and location of its production facilities. In chapters 2–4, I rely on partial-equilibrium models that capture crucial aspects of both technology characteristics and country characteristics.

These combine to determine the equilibrium “regime,” the location of headquarters and the number and location of plants. The models nest familiar national firm models, such as those of the strategic trade policy literature, as special cases.

Chapters 5–9 provide general-equilibrium analyses, allowing for factor endowments to play important roles in determining equilibrium. Among the many questions analyzed are the relationship between trade and affiliate production, the effects of trade versus investment liberalization on factor prices, and the location of production.

These general-equilibrium models provide testable hypotheses about how the pattern of affiliate production in the world economy should relate to country characteristics, such as total market size, differences in market size, relative factor endowments, and trade and investment barriers. Chapters 10–12 provide formal econometric tests and estimates of these predictions.

The final section of the book, chapters 13–15, considers “internalization.” This involves an analysis of the mode by which firms serve foreign markets. While all of the earlier chapters restrict this choice to exports versus foreign production, chapters 13–15 add an additional arm’s-length option such as licensing. Thus there are two modes of foreign production, one an owned subsidiary in which firm-specific assets are transferred internally within the firm, and the other a licensing agreement with an unaffiliated firm.

Six appendixes to the book present and explain features of the software and actual code used in simulations.

4 What’s Out

Truth in advertising requires that I also point out what is not in the book and provide brief explanations why.

Macroeconomics, capital flows. As noted above, a lot of evidence suggests that the decision to build or acquire a foreign factory is largely separate from the decision of where to raise the financial capital. The capital funds can come from the firm’s internal retained earnings, from parent-country equity or debt financing, from host-country financing, or from third markets. In this book, I will abstract from the financing question entirely. Real factors of production, generally skilled labor and “other” factors, are required for the fixed costs for firms and plants. These physical factors do not flow between countries, but the services of assets produced with skilled labor do flow from parent to affiliate. Thus

multinationals are exporters of services of real assets—such as management, engineering, and marketing services—to foreign locations.

I believe that the financing decisions and accompanying capital flows are important and interesting, but I also believe that they can be largely separated from the real decisions about the location of production and the direction of trade. I concentrate entirely on the latter, and I hope that others can contribute the important but missing macroeconomics.

Firms organization and boundaries of the firm. My focus in this book is to incorporate the multinational firm into the general-equilibrium theory of international trade. This requires me to assume rather simple technologies and models of the firm itself. Thus the reader will not find much analysis of the boundaries, organization, and ownership determinants of the firm. I will not mention the “transactions-cost approach” to the multinational that has been popular in the international business literature. Part III of the book on internalization models will explicitly treat the firm’s decision to transfer assets within the firm’s ownership structure versus through some arm’s-length alternative. But we will not probe deeper into the theory of the firm than this. As is the case of capital flows, I believe that models of the firm are important, but that they are not crucial to developing the basic general-equilibrium approach. Again, I very much hope that this work will be amended by others with richer models of the firm itself.

Dynamics. I have some (but not much) regret that there is only a minimal amount of dynamic analysis in the book. Once again, the principal focus is on incorporating endogenous production and location decisions into the mainstream general-equilibrium model of trade. This has proved quite enough for one book, and at many points I have resisted the temptation to expand the scope beyond its current boundaries. Interesting questions exist about multinationals such as the importance of early entry and initial knowledge advantages both on the growth and expansion of firms and on the choice of entry mode. I touch on some of these issues in two-period and infinite-horizon games in chapters 4 and 13–15, but a great deal is left to future researchers.

Normative policy analysis, strategic policies. This book focuses almost entirely on positive analysis. I provide analyses of a few policy experiments in order to show how endogenous choices by firms, largely ruled out by assumption in the strategic trade policy literature, yield a richer set of outcomes. But I am careful to avoid any discussion of optimal policy choice. The models in the book are easily adapted to this task, however, by anyone interested in such analyses.

5 Numerical versus Analytical Models

Chapters 2–4 and 13–15 of this book rely on analytical methods to derive results. Chapters 5–9 rely heavily on numerical simulations. The former chapters are partial-equilibrium while the latter are general-equilibrium models.

I and others in the trade industrial organization literature try to find analytical solutions to problems whenever possible. But although I try to use the simplest model suitable, even the basic general-equilibrium model that has the features I want suffers from two difficulties with respect to analytical methods. First, the dimensionality of even the minimal model in chapter 5 is high, having over forty unknowns. Second, many of the key relationships are inequalities, with associated nonnegative variables. The models are, in other words, nonlinear complementarity problems. Which inequalities hold with equality, and which as strict inequalities, is determined in the solution of the model. A comparative statistics experiment in which some parameter is altered typically changes the set of inequalities that hold as equations, and therefore which endogenous variables are zero and which are strictly positive. An example would be which types of firms (national firms, horizontal multinationals, vertical multinationals) are active in equilibrium. This is not difficult with two-firm or three-firm types in a partial-equilibrium model, but with four or six in general equilibrium as in chapters 5–8 this becomes intractable.

Two responses to these difficulties are common in the trade-industrial organization literature. The first is to stick with partial-equilibrium models, as in the strategic trade policy literature. The second is to use general-equilibrium models but assume costless trade and factor price equalization between countries. The former sacrifices important issues on the factor-market side, while the latter does so on the product-market side.

In many cases, neither simplification is acceptable for my purposes. Therefore, following three chapters that use partial equilibrium models to obtain analytical solutions, I turn to numerical methods for simulation, relying on Rutherford's nonlinear complementarity solvers that are now subsystems of GAMS. In the general-equilibrium models, I lay out all of the inequalities and associated complementary variables that are solved in the simulations. I also try to provide intuition through the use of partial-equilibrium thought experiments and

models-of-the-model. The analytical solutions to partial-equilibrium models in chapters 2–4 should also help lay out the basic intuition. Finally, I provide the actual GAMS code and documentation for some of the important models in six appendices. You might have a look at these early on in order to see how the simulation models work.

Thanks for reading this preface. I hope that your investment in the book is worthwhile and that many of you continue to work in this important and interesting subfield.