Review of *Trade, growth and poverty reduction* by T. N. Srinivasan

The relationship between trade and growth is one of the oldest topics in economics and currently one of the most relevant. This nice short book by T. N. Srinivasan focuses on this important relationship with an eye toward the poorest, least-developed, landlocked, small, and vulnerable countries. This relationship is worth examining and this book is worth reading for professional economists as well as policy makers. The clear style makes it assessable to interested lay people as well. The level of the book is deep and thought provoking. Fundamental issues are the potential of trade to raise economic growth among the poorest of the poor countries as well as the general situation of these countries in the international setting.

The book has a scholarly experienced tone. The intricacies of the roles of the World Bank, various UN agencies, and WTO in expediting trade and growth among the poorest countries are evaluated in a nonpolitical objective fashion. Few economists have the combination of the knowledge of economics and practical worldly experience to write such a book.

The theory of economic growth is central to the reasoning of the book. Srinivasan is able to evaluate the "noise" of politics and lobbying in terms of more fundamental underlying economic relationships. The importance of the recent financial industry collapse and the resurfacing trend toward protectionism is discussed. The relative importance of global and regional trade agreements is assessed. The practical role of the Doha Round relative to the poorest countries is covered in some detail.

The book starts with a succinct 23 page overview. The chapters are (1) Introduction, (2) Trade, growth, and poverty reduction, (3) Salient characteristics of least-developed countries, (4) Cooperation between developed and developing countries to strengthen the links between trade, growth, and poverty reduction, (5) Doha round and the least-developed countries, and the excellent conclusion and (6) Making global partnership for development more effective: some recommendations.

The theme is a global partnership for development and Srinivasan makes sensible recommendations on how to attain this goal. He notes correctly that "it is futile to talk about a hypothetical partnership for development in all its aspects" and focuses attention instead on the self interested governments and international organizations involved in the political process.

T. N. Srinivasan has a distinguished career and has published extensively on economic development. The reader benefits from his insight into the economics and politics of poverty, trade, and economic growth based on a long thoughtful career.

The Index and References are complete and useful. The 152-page book is published by the Commonwealth Secretariat in the UK and the Academic Foundation in New Delhi and is nicely produced with clean clear font. This book will find its way onto the shelves of economists, practitioners, and others interested in the potential of trade to lower poverty and will remain as a useful reference.

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Economic modeling and inference, by Bent Jesper Christensen and Nicholas M. Kiefer

Models of dynamic choice under uncertainty now pervade economics, thanks in large part to the availability of dynamic programming tools for their analysis and the training of a generation of economists to use these tools. This book distinguishes itself from most on dynamic programming by covering theoretical and econometric issues jointly. Christensen and Kiefer motivate this approach convincingly. The job of empirical economics is to extract and organize useful information from economic data; they argue that to this end, models of optimizing behavior and statistical methods complement each other. Economic theory adds structure by ruling out choices that are not in the best interest of the decision maker; likelihood-based econometrics uses the model to separate "sufficient" data information from the chaff. Material throughout the book illustrates the benefits of this joint approach.

The first five chapters establish notation and definitions and introduce simple examples that will be revisited and elaborated throughout the book. We see for the first time several general problems that arise in different forms throughout the book. The "curse of dimensionality" describes the rapid increase in computational cost as the number of control and state variables increases. The curse of degeneracy and the closely related curse of determinacy are manifestations of problems that can arise wherever likelihood-based statistical inference is applied to economic models. Choices in standard economic models, even models of decision making under uncertainty, are intrinsically deterministic: while states of the world may be random, choices are not. In the context of models that can be framed as dynamic programs, the problem of degeneracy is the deterministic relationship between states and controls: only one value of the control variable is optimal given the state variable. The curse of determinacy arises when the data contradict this strict relationship. We also see here the outlines of three solutions to the curses of degeneracy and determinacy, and these too are familiar in a broader context. In random utility models, the decision maker observes information that the econometrician does not. Measurement error models describe observed choices as noisy measurements of true choices. In

imperfect control models, decisions are corrupted according to some probabilistic law. Through these curses and their solutions, we clearly see how model specification and likelihood-based inference interact.

Chapters 6 through 12 are on dynamic programming problems with continuous states and discrete controls, with a special emphasis on optimal stopping problems. Two main examples illustrate issues that arise in more general models. While appropriately simple, they are also important models in their own right. In the job search problem, the decision maker searches for employment and stops to accept a wage offer that is more attractive than continuing the search. In the second example, the decision maker must choose when, if ever, to exercise an American option. Optimal stopping problems have a particularly simple control and so the optimal policy is often relatively easy to compute. Even so, statistical inference is not straightforward: even in a very simple prototypal model, the support of the accepted wage distribution depends on the reservation wage, which in turn depends on parameters. This means that standard asymptotic analysis does not apply. The authors outline non-standard asymptotic analysis and exact distribution theory for the prototypal model. A chapter-long introduction to asset markets provides necessary background for the option exercise problem and later material on future contracts and term structure models. A chapter on the option exercise problem clarifies the similarities and differences between this problem and the job search problem. Chapter 12 introduces a third stopping problem, a retirement timing problem.

Chapter 13 covers continuous states and controls, with special emphasis on linear-quadratic models, where value function iteration reduces to operations on matrices of low and fixed dimension. Chapter 14 covers continuous time models, with sections on optimal stopping and states with jumps. The chapter includes many applications and examples in finance, including dynamic consumption and portfolio choice, derivative pricing and term structure models.

Chapters 15 to 18 present a large number of applications covering a wide range of topics in microeconomics, macroeconomics and finance. Inevitably, these are treated in much less detail, but they are invaluable in giving a sense of the wide applicability of the empirical dynamic programming approach. These chapters deviate from the roughly cumulative development of much of the book and serve as a reference and guide to the literature.

Chapters 19 and 20 return to search models in order to introduce equilibrium models. Analysis is in continuous time, workers can now search on the job, and there are profit maximizing firms. This allows the derivation of the wage offer distribution in equilibrium. The chapters thoroughly cover theory, econometrics, data and results. A first model in Chapter 19 gives a reasonable fit to Danish data for durations but not wage distributions. Extensions in Chapter 20 with measurement error or heterogeneous firm productivity fit the data better.

The book is most suited for economists doing or preparing to do empirical research with dynamic structural models, including Ph.D. students in their second or higher year. The authors assume a high degree of statistical background and sophistication. The material on dynamic programming is self contained, but advances quickly. There are many insightful comments throughout the book and some valuable practical guidance that beginning practitioners would have more difficulty finding in journal articles. There is enough material for the student to get started solving the simplest dynamic programs on a computer, but the need to supplement the text with material on numerical methods would quickly emerge. One could build a course on dynamic programming and likelihood-based inference around the first nine chapters, adding material from later chapters according to the professor's interest. Each chapter has a small number of exercises, and the acknowledgements in the book suggest that earlier versions of the book have already been used in Ph.D. courses and have improved as a result. The book would also be suitable as a secondary or recommended text in a wide variety of courses and its moderate price makes this practical.

The book would also be useful as a reference book to practitioners, as it concisely covers an impressive range of topics. One inevitable result is that much of the material is very dense. However, the book has excellent bibliographies, concise but thorough, at the end of every chapter, directing the reader to supplementary material.

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Review of *International Trade in Services and Intangibles in the Era of Globalization,* Edited by Marshall Reinsdorf and Matthew J. Slaughter ☆

Every year, tens of thousands of Chinese and Indian nationals earn doctoral degrees in science and engineering. These graduates are sought by global firms for both their technical skills and for their broader experiences, such as their insider knowledge of a big emerging market. Recent advancements in information and communications technology have made it easier for businesses to integrate these workers with their counterparts in other countries. Consequently, some highly educated workers in wealthy countries now face the prospect being displaced by a worker in a low-wage country. A common term for this rise in the global sourcing of labor inputs is *offshoring.*

☆ The views expressed here are those of the author, and not necessarily those of the U.S. Bureau of Economic Analysis.