

© 1984 by the Massachusetts Institute of Technology

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the publisher.

This book was set in Times New Roman by Asco Trade Typesetting Ltd., Hong Kong, and printed and bound by Halliday Lithograph in the United States of America

Library of Congress Cataloging in Publication Data

Leamer, Edward E.

Sources of international comparative advantage.

Bibliography: p.

Includes index.

1. Comparative advantage (Commerce). 2. International economic relations.

I. Title.

HF1412.L42 1984

382.1'042 83-19948

ISBN 0-262-12107-7

To my children: Abigail, Michael, and Stephanie

Contents

List of Figures	ix
List of Tables	xi
Preface	xiii
General Notation	xxi
1 Theories of International Trade	1
1.1 Assumptions	2
1.2 The Basic Trade Theorems	3
1.3 The Effects of Departures from Assumptions	11
2 Testing the Theories of International Comparative Advantage	45
2.1 What Are the Hypotheses?	46
2.2 Measuring the Accuracy of the Heckscher-Ohlin Predictions	48
3 Formation of the Trade Aggregates	60
3.1 Cluster Correlations	61
3.2 Examination of 3-Digit Data	72
3.3 Why Are There Clusters?	78
4 Data Preview	84
4.1 Net Export Data	84
4.2 Resource Data	90
4.3 Trade Dependence and Resource Abundance Profiles	94
4.4 Notes on Data Accuracy	108
4.5 Cross-Country Correlations	114
5 Econometric Methods	117
5.1 Heteroscedasticity, Gross Errors, and Nonlinearities	118
5.2 Chronic Measurement Errors	127
5.3 Prior Information and the Collinearity Problem	136
5.4 Beta Coefficients as Measures of Significance	152

6	Estimates of the Trade Dependence Model	155
6.1	Purposes of the Empirical Analysis	155
6.2	Choice of Model	158
6.3	Econometric Strategy	160
6.4	Discussion of the Estimates	161
6.5	Nonlinearities	180
6.6	Conclusions	187
7	Counterfactuals	188
7.1	Most Important Resources	189
7.2	Tariffs and the Functional Distribution of Income	207
	Appendix	
A	Factor Market Distortions in the 2×2 Model	215
B	Data Sources and Methods	220
C	Scatter Diagrams and Statistical Results	244
D	Trade Dependence and Resource Abundance Profiles	277

Notes 337

Bibliography 341

Index 351

List of Figures

1.1	Unit-Value Isoquant and Isocost Lines
1.2	Equilibrium Factor Costs
1.3	Factor Intensity Reversal
1.4	Allocation of Factors between Industries
1.5	Unit-Value Isoquants, Factor Prices Not Equalized
1.6	Unit-Value Isoquants, Factor Prices Equalized
1.7	Outputs and GNP: 3 Goods and 2 Factors
1.8	Wage Rates: 3 Goods and 2 Factors
1.9	Output, Consumption, and Trade: 3 Goods and 2 Factors
1.10	Trade per Worker: Factor Intensity Reversals
3.1	Characteristics of Industries
3.2a	Cones of Diversification
3.2b	Cones of Diversification
4.1	Boxplots of Net Export Data: 1958
4.2	Boxplots of Net Export Data: 1975
4.3	Boxplots of Resource Data: 1958
4.4	Boxplots of Resource Data: 1975
5.1	Scatter Diagram, CEREALS Net Exports versus LABOR 3: 1975
5.2	Scatter Diagram, CEREALS Net Exports versus LAND 3: 1975
5.3	Scatter Diagram, MACH Net Exports/LABOR versus CAPITAL/LABOR: 1975
5.4	An Information Contract Curve
5.5	Contract Curves in the Hull of 2 ^d Regressions
5.6	Ellipse of Constrained Estimates
C.1	Scatter Diagram, PETRO Net Exports/GNP versus OIL/GNP: 1958, 1975
C.2	Scatter Diagram, MAT Net Exports/LABOR versus MINERALS/LABOR: 1958, 1975
C.3	Scatter Diagram, FOR Net Exports/GNP versus LAND 4/GNP: 1958, 1975
C.4a	Scatter Diagram, TROP Net Exports/GNP versus LAND 1/GNP: 1958, 1975
C.4b	Scatter Diagram, TROP Net Exports/LABOR versus CAPITAL/LABOR: 1958, 1975
C.5	Scatter Diagram, ANL Net Exports/GNP versus LAND 3/GNP: 1958, 1975
C.6a	Scatter Diagram, CEREALS Net Exports/LABOR versus LAND 1 + 3 + 4/LABOR: 1958, 1975

- C.6b Scatter Diagram, CEREALS Net Exports/GNP versus LABOR/GNP: 1958, 1975
- C.7 Scatter Diagram, LAB Net Exports/LABOR versus CAPITAL/LABOR: 1958, 1975
- C.8a Scatter Diagram, CAP Net Exports/LABOR versus CAPITAL/LABOR: 1958, 1975
- C.8b Scatter Diagram, CAP Net Exports/LABOR versus LAND 2 + 3 + 4/LABOR: 1958, 1975
- C.9a Scatter Diagram, MACH Net Exports/LABOR versus CAPITAL/LABOR: 1958, 1975
- C.9b Scatter Diagram, MACH Net Exports/GNP versus COAL/GNP: 1958, 1975
- C.10a Scatter Diagram, CHEM Net Exports/GNP versus CAPITAL/GNP: 1958, 1975
- C.10b Scatter Diagram, CHEM Net Exports/GNP versus COAL/GNP: 1958, 1975
- C.11 Scatter Diagram, GNP/LABOR versus CAPITAL/LABOR: 1958, 1975

List of Tables

- 1.1 Agricultural Wage Rates: 1972
- 1.2 Fraction of Gross Fixed Capital Formation Financed from Abroad
- 1.3 Average Tariffs on Dutiable, Nonagricultural Imports
- 1.4 Freight Factors
- 1.5 Wages by Manufacturing Sector: 1975
- 1.6 Composition of Private Consumption Expenditure
- 2.1 U.S. Net Exports of Labor Services by Skill Group: 1962
- 3.1 Cross-Country Correlations of Components with Aggregates, Net Export Data
- 3.2 Classification Problems
- 3.3 Share of Components in Aggregates
- 3.4 Characteristics of Industries
- 3.5 Correlations of 3-Digit Data with Aggregates: 1978
- 4.1 Aggregate Shares
- 4.2 Aggregate Correlation Matrix: 1958
- 4.3 Aggregate Correlation Matrix: 1975
- 4.4 The Ladder of Development: 1958
- 4.5 The Ladder of Development: 1975
- 4.6 Prices and Values of Mineral Resources
- 4.7 International Standard Classification of Occupations (ISCO), Major Group 0/1: 1968
- 4.8 Population Characteristics
- 4.9 Climate Classification
- 4.10 Correlations among Trade/GNP and Endowments/GNP
- 4.11 Correlations among Trade per Worker and Endowments per Worker
- 5.1 Estimates of CEREALS Equation: 1975
- 5.2 Direct and Reverse Regressions, MACHINERY Equation: 1975
- 5.3 Destructive Diagnostics, MACHINERY Equation: 1975
- 5.4 Prior Means and Standard Errors for the GNP Regressions
- 5.5 Prior Means, Net Export Equations: 1958
- 5.6 Prior Means, Net Export Equations: 1975
- 5.7 Bayes Estimates, MACHINERY Equation: 1975
- 5.8 Estimates and Bounds, MACHINERY Equation: 1975
- 6.1 Weighted Least-Squares Estimates
- 6.2 Bounds for Weighted Least-Squares Estimates Formed by Omitting Observations One at a Time
- 6.3 *t*-Statistics of Extreme Countries, Weighted Regressions
- 6.4 Errors-in-Variables Diagnostics

- 6.5 Bayes Estimates
- 6.6 *t*-Values for the Bayes Estimates
- 6.7 Beta Values Based on Bayes Estimates
- 6.8 Bounds for Bayes Estimates
- 6.9a Estimates and Bounds, Nonlinear GNP Equation: 1958
- 6.9b Estimates and Bounds, Nonlinear GNP Equation: 1975
- 6.10 Weighted Nonlinear Net Export Regressions
- 6.11 *t*-Statistics for Nonlinear Terms of Weighted Regressions
- 7.1 Percentage Trade Reduction: 1958
- 7.2 Percentage Resource Change: 1958
- 7.3 Percentage Trade Reduction: 1975
- 7.4 Percentage Resource Change: 1975
- 7.5 Estimated Capital Coefficients and U.S. Net Exports
- 7.6a Most Important Resources: 1958
- 7.6b Most Important Resources: 1975
- 7.7 Estimated Elasticities of Factor Rewards with Respect to Changes in Product Prices
- 7.8 Most Sensitive Factor Returns
- A.1 Effects of Labor Market Distortion
- B.1 Data Set
- B.2 Variables and Sources: Country Attributes
- B.3 Secondary Sources and Notes: Country Attribute Data
- B.4 Occupational Data Availability
- B.5 Correspondence between Original SITC and SITC Revised
- B.6 Trade Data Notes
- B.7 Trade-Reporting Systems
- D.1 Correspondence between Graphed Numbers and Trade Shares
- D.2 Correspondence between Graphed Numbers and Resource Ratios