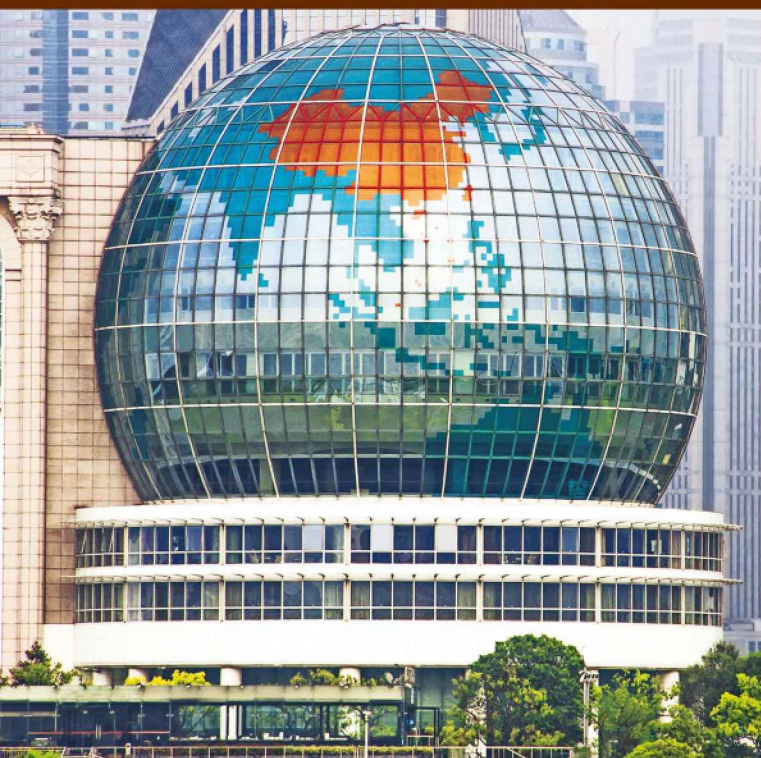




DEVELOPMENT ECONOMICS

GÉRARD ROLAND



DEVELOPMENT ECONOMICS

This page intentionally left blank



DEVELOPMENT ECONOMICS

G rard Roland

University of California, Berkeley

 **Routledge**
Taylor & Francis Group
LONDON AND NEW YORK

First published 2014 by Pearson Education, Inc.

Published 2016 by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN
711 Third Avenue, New York, NY, 10017, USA

Routledge is an imprint of the Taylor & Francis Group, an informa business

Copyright © 2014 Taylor & Francis

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Notice:

Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

Credits and acknowledgments borrowed from other sources and reproduced, with permission, in this textbook appear on the appropriate page within text.

Chapter opener photo: Ssguy/Shutterstock

Cover Designer Jonathan Boylan

ISBN-13: 9780321464484 (hbk)

Library of Congress Control Number: 2013942162

Brief Contents

Chapter 1	The Development Gap	1
Chapter 2	Poverty and Inequality	27
Chapter 3	Population Growth	55
Chapter 4	Economic Growth	82
Chapter 5	Structural Change and Development Strategies	113
Chapter 6	International Trade and Exchange Rates	145
Chapter 7	Institutions and Economic Development	175
Chapter 8	Markets and Hierarchies	203
Chapter 9	Political Institutions	232
Chapter 10	Legal and Fiscal Institutions	264
Chapter 11	Culture	288
Chapter 12	Rural Land Rights and Contracts	312
Chapter 13	Property Rights and Efficiency in Urban Areas	340
Chapter 14	Market Development	366
Chapter 15	The Role of Credit Markets in Development	394
Chapter 16	Health Care Delivery in Developing Countries	422
Chapter 17	Delivering Education in Developing Countries	455
Chapter 18	Delivering Infrastructure in Developing Countries	485
Chapter 19	Corruption	508
Chapter 20	Conflict	537
Appendix	Econometric Appendix	561
	Glossary	581
	Index	593

This page intentionally left blank

Contents

Chapter 1 The Development Gap 1

- Facts about the Development Gap** 4
 - The Income Gap 4
 - The Poverty Gap 6
 - The Health Gap 7
 - The Education Gap 10
 - The Urbanization Gap 11
 - Why Is There a Development Gap? 13
- The Evolving Development Gap** 13
 - Differences in Economic Growth 14
 - Population Growth 16
- Stories of Economic Catch-Up and Decline** 17
 - The Historical Catch-Up of Japan and Germany 18
 - Economic Decline 21
 - Important Questions 24

Chapter Summary 25 • Key Terms 25 •
Review Questions 25

Chapter 2 Poverty and Inequality 27

- Poverty Measurement and Comparisons** 28
 - Measuring Poverty 28
 - How to Compare Poverty Levels 33
 - Poverty Rates in Practice 36
- Measurements and Comparisons of Income Inequality** 38
 - Measuring Income Inequality 38
- Economic Determinants of Inequality** 44
 - Education and Income Inequality 44
 - Land Ownership and Income Inequality 45
- Inequality, Growth, and Development** 46
 - The Kuznets Hypothesis 46
 - Income Inequality and Economic Growth 49
 - Inequality over Time 50

Chapter Summary 53 • Key Terms 53 •
Review Questions 54

Chapter 3 Population Growth 55

- Population over Time and the Demographic Transition** 56
 - An Exponentially Growing Population 56
 - The Evolution of Population Growth Rates 58

- The Determinants of Population Growth** 60
 - Fertility, Mortality, and Birth and Death Rates 60
 - Age Distribution 61

- The Determinants of Fertility Rates** 63
 - The Economics of Fertility Choices 63
 - Fertility Choices and Institutions 69
 - Fertility Choices and the Demographic Transition 73

- Family Planning and Population Growth** 77
 - Family Planning Policies 77
 - Externalities and the Economics of Family Planning 78

Chapter Summary 79 • Key Terms 80 •
Review Questions 80

Chapter 4 Economic Growth 82

- Growth and Factors of Production** 83
 - Factors of Production 83
 - The Production Function 84
 - Factor Productivity 85
 - Factor Shares 86
 - Growth Accounting 87
- The Neoclassical Solow Growth Model** 88
 - Constant Returns to Scale and Diminishing Marginal Products 89
 - Equilibrium in the Solow Model 90
 - The Steady State in the Solow Growth Model 91
 - Growth Inside and Outside the Steady State 92
 - Technological Progress and the Steady State 93
 - The Effect of Different Savings Rates 94
 - Differences in Human Capital 95
 - Income Convergence 96

- Endogenous Growth Theory** 97
 - Boundless Knowledge-Based Growth 97
 - Knowledge as a Non-Rival Good 98
 - Basic Equations of the Romer Model 100
 - The Romer Model versus the Solow Model 100
 - Intellectual Property Rights and Technology Transfers 101

- Empirical Analysis of Economic Growth** 102
 - Geography and Growth 104
 - Institutions and Growth 105

Chapter Summary 111 • Key Terms 111 •
Review Questions 112

Chapter 5 **Structural Change and Development Strategies** 113

- Structural Change** 114
 From an Agricultural to an Industrial Economy 114
 From an Industrial to a Service Economy 114
 Structural Change across Industrial Sectors 115
- The Lewis Model of Structural Change** 116
 The Traditional and Modern Sectors 116
 Transfer of Labor from the Traditional to the Modern Sector 118
 The Lewis Model in Practice 120
 The Role of Institutions 122
- The Harris-Todaro Model of Rural to Urban Migration** 123
 The Harris-Todaro Model and the Migration Equilibrium 123
 The Implications of the Harris-Todaro Model 126
- Development Strategies: Sectoral Growth** 128
 Balanced and Unbalanced Growth 128
 Big Push Theories 130
- Development Strategies: Import Substitution versus Export Promotion** 132
 Import Substitution and the Prebisch-Singer Hypothesis 133
 Industrialization and the Protection of Infant Industries 134
 Export Promotion and the Asian Miracle 135
- The Foreign Aid Controversy** 139
 Sachs and the Argument for Foreign Aid 140
 Easterly and the Skeptics' View 140
 What Conclusions Should We Draw about Foreign Aid? 141
- Chapter Summary 142 • Key Terms 143 •
 Review Questions 143

Chapter 6 **International Trade and Exchange Rates** 145

- World Trade Evolution and Developing Countries** 145
 The Increased Openness of Developed and Developing Economies 146
 A Diverse Trade Performance across Regions 147
 The Evolution of Trade Specialization in Developing Countries 148
- The Theory of Comparative Advantage** 148
 The Benefits of Exchange and Specialization 150

- Japanese DVD Players and Chinese Shirts: Comparative Advantage in Action 151
 Factor Endowments and Comparative Advantage 152
 Comparative Advantage and Patterns of Trade 154
 Trade Specialization and Export Price Risk 154
- The Politics of Trade** 156
 Winners and Losers in International Trade 156
 Collective Action Failure 157
 "Give and Take" 157
- The Costs of Trade Barriers** 158
 Protectionism and Tariffs 158
 Nontariff Barriers 159
- Trade Institutions: Bilateral versus Multilateral** 161
 Multilateral Trade Avoids Trade Diversion 161
 Multilateral Trade Agreements Are Politically Easier to Achieve 162
 The World Trade Organization 163
- Exchange-Rate Policies in Developing Countries** 165
 Degrees of Convertibility 166
 Fixed and Floating Exchange-Rate Regimes 168
- Chapter Summary 172 • Key Terms 172 •
 Review Questions 173

Chapter 7 **Institutions and Economic Development** 175

- What Are Institutions?** 176
 Formal Institutions 176
 Informal Institutions 177
 Interactions between Institutions 178
- What Do Institutions Do?** 178
 Informational Problems 179
 The Hold-Up Problem 185
 The Commitment Problem 187
 The Cooperation Problem 190
 The Coordination Problem 195
- The Persistence of Inefficient Institutions** 198
 The Functionalist Fallacy 198
- Chapter Summary 200 • Key Terms 201 •
 Review Questions 202

Chapter 8 **Markets and Hierarchies** 203

- The Central Planning Debate** 204
 The Theoretical Argument against Central Planning 205
 Lange's Rebuttal 206
 Hayek's Fundamental Criticism 207

The Central Planning Experiment	208
Managerial Incentives under Central Planning	208
Central Planning and Shortage	213
Economic Behavior under Shortage	215
Worker Behavior	220
Complexity, Coordination, and the Slow Demise of Central Planning	222

Prices versus Quantities	224
Coordination Mistakes Using Price and Quantity Signals	224

Institutions and the Boundaries of the Firm	228
The Trade-Off between Efficiency and Holdup	229
Less Vertical Integration with Better Institutions	229

Chapter Summary	230	•	Key Terms	230	•
Review Questions	231				

Chapter 9 Political Institutions 232

Political Regimes 233

Economic Effects of an Autocracy versus a Democracy	235
The Theory of Autocracy	236
The Theory of Democracy	238
Autocracy and Democracy Compared	240

Political Institutions in a Democracy	244
Presidential and Parliamentary Democracies	244
Electoral Rules	245
The Economic Effects of Democratic Institutions	246

Political Institutions in an Autocracy	249
Communist Regimes	249
Nazism and Fascism	250

Waves of Democratization 251

Theories of Democratization	254
Income and Democracy	254
Education and Democracy	255
Inequality, Social Conflict, and Democracy	257

Chapter Summary	262	•	Key Terms	263	•
Review Questions	263				

Chapter 10 Legal and Fiscal Institutions 264

Legal Institutions	264
Differences between the Common-Law and Civil-Law Systems	265

The Economic Effects of Different Legal Systems	268
Controversies over the Importance of Common and Civil Law	272

Fiscal Institutions	275
Taxation in Developing Countries	275
Determinants of Tax Structure	280
Why Does Taxation Differ between Developed and Developing Countries?	283

Chapter Summary	285	•	Key Terms	286	•
Review Questions	286				

Chapter 11 Culture 288

Measuring Culture	289
The World Values Survey	289
Schwartz's Cultural Mappings	293
Hofstede's Index of Individualism and Collectivism	294

Culture's Effect on Institutions	297
Culture and the Quality of Democracy	297
Culture and Norms of Governance	300
Culture and Contract Enforcement	301

Cultural Obstacles to Economic Development	303
Egalitarian Norms and Development	303
Religious Taboos on Interest	304
Islam and Inheritance Laws	305

The Effects of Culture	307
Religiosity and Growth	307
Religious Beliefs and Trust	308
Culture and Thrift	308
Pitfalls to Avoid in Research on Culture	309

Chapter Summary	310	•	Key Terms	311	•
Review Questions	311				

Chapter 12 Rural Land Rights and Contracts 312

Worldwide Land Distribution and Land Contracts 313

Properties of Land Contracts	316
Farmer Ownership	317
Communal Ownership	318
Fixed Land Rental	318
Sharecropping	320
Labor Contracts	320

Economic Effects of Land Contracts	323
Communal and Private Ownership	324
Sharecropping Compared to Privately Owned Farms	326
Sharecropping Compared to Fixed Rental Contracts	327

- Plantations and Slave Labor 327
- Plantations and Privately Owned Family Farms 328
- Institutions and Patterns of Land Inequality and Land Contracts 329

Land Reform 330

- The Experience of Land Reform 330
- Obstacles to Land Reform 333
- Effects of Land Reform 335

Chapter Summary 338 • Key Terms 338 •
Review Questions 339

Chapter 13 **Property Rights and Efficiency in Urban Areas** 340

Property Rights and the Informal Sector 341

- The High Transaction Costs in the Informal Sector 342
- Institutional Obstacles to Entry in the Formal Sector 343
- The Economic Effects of Titling 345

Institutions and Property Rights Protection: Lessons from Transition Economies 347

- The Informal Sector and Institutional Quality 347
- Property Rights, Investment, and Market Development 349

Privatization 352

- From Nationalization to Privatization 352
- Privatization Goals and Problems 353
- Methods of Privatization in Developing Countries 356
- Privatization Outcomes 357

Chapter Summary 364 • Key Terms 364 •
Review Questions 364

Chapter 14 **Market Development** 366

Institutions and Market Development 367

- Taking Markets for Granted 367
- Specific Problems of Market Development in Poor Countries 368
- Business Networks in Development 370

The Emergence of Markets in Transition Countries 371

- The Output Fall in Central and Eastern Europe 372
- China and the Dual-Track System 374
- Lessons from the Effects of Transition on Market Development 376

Rural Markets and the Monopsony Problem 376

- Monopsony and the Hold-Up Problem 377
- Monopsonies in Developing Countries 378
- Possible Solutions to the Monopsony Problem 379

Market Integration 381

- Communication Obstacles to Market Integration 382
- Transportation Obstacles to Market Integration 384
- Regulatory Obstacles to Market Integration 386

Famines 388

- Amartya Sen's Analysis of Famine 388
- Famines and Democracy 390

Chapter Summary 391 • Key Terms 392 •
Review Questions 392

Chapter 15 **The Role of Credit Markets in Development** 394

The Demand for Credit in Developing Economies 395

The Theory of Credit Markets in Development 396

- Financing an Entrepreneur in Mumbai 396
- Adverse Selection and Credit Rationing 398
- Moral Hazard and Collateral 400
- Moral Hazard and Monitoring 401
- Monitoring and Variation in Interest Rates 402
- Dealing with Default 403

Credit Constraints in Developing Countries 404

- The Difficulty of Measuring Credit Constraints 404
- Exploiting the Indian Priority Lending Reform 405

Microfinance 409

- How Does Microcredit Work? 409
- Incentive Properties of Microcredit 410
- Other Forms of Microfinance 413
- Is Microfinance Profitable? 415
- Evaluating Microfinance 418

Chapter Summary 419 • Key Terms 419 •
Review Questions 420

Chapter 16 **Health Care Delivery in Developing Countries** 422

A Historical Perspective: The Epidemiological Transition 423

Measuring Health 424

- Self-Reported Health Status 424
- Self-Reported Symptoms 425
- Reporting Daily Activities 425
- Nutrient Intake 425
- Anthropometric Measures 426
- Disability Adjusted Life Year (DALY) 427

Diseases and Development 428

- HIV 429

Diarrheal Diseases	432
Malaria	433
Worms	437
Tuberculosis	440

Cheap Drugs and Development	441
Why Pharmaceutical Companies Spend So Little on Developing Countries	442
An Advance Market Commitment	442
The Costs of Vaccine Commitments for Developing Countries	443

Health and Income	444
Does Better Health Lead to Higher Incomes?	444
Does More Income Improve Health?	446

Institutions and the Provision of Health Care	447
Variable Quality of Health Care Systems	447
Corruption in the Health Care Sector	448

Chapter Summary 452 • Key Terms 453 • Review Questions 454

Chapter 17 Delivering Education in Developing Countries 455

Measuring the Education Gap	456
The Primary School Gap	456
The Secondary-School Gap	458
The Educational Gender Gap	458
Educational Achievements	459
The Issue of Education Quality	462

The Returns to Education in Developing Countries	464
Externalities of Education	465
The Role of Government in Education	466
Empirical Estimates of the Returns to Education	467

Institutions and Education in Developing Countries	470
Why Is There Child Labor and Should It Be Banned?	470
The Indian Caste System and Educational Choices	473

What Reforms Can Improve Education?	476
Fighting Teacher Absenteeism	476
Are Incentives for Teachers Effective?	477
Decentralization	478
Vouchers	479
Reducing Education Costs	480
Reducing the Educational Gender Gap	481

Chapter Summary 482 • Key Terms 483 • Review Questions 484

Chapter 18 Delivering Infrastructure in Developing Countries 485

The State of Infrastructure in Developing Countries	486
Inequality of Access to Infrastructure	486
Institutions for Infrastructure Provision	488

Development Effects of Infrastructure Investment	489
The Effect of Infrastructure Investment on Growth	490
The Benefits of Transportation Infrastructure	491
The Costs and Benefits of Dams	494
White Elephants	497

Investment Risk and the Cost of Capital in Infrastructure	498
The Cost of Capital	499
Estimates of the Cost of Infrastructure Investment	500

Geography and Infrastructure	501
Institutional Aspects of Infrastructure	502
Regulatory Reform	502
Decentralization	503
Fighting Corruption in Road Construction	504

Chapter Summary 505 • Key Terms 506 • Review Questions 507

Chapter 19 Corruption 508

What Is Corruption?	509
Measuring Corruption	510
Objective Measures of Corruption	511
Subjective Measures of Corruption	513

Greasing the Wheels or Rotting the Fruit Basket? 515

Corruption and Growth 517

Why Are Some Countries More Corrupt than Others? 518

Development and Corruption	519
Political Institutions and Corruption	520
Legal Institutions and Corruption	522
Natural Resources, Trade, and Corruption	522

Culture and Corruption	523
Different Cultures, Their Various Social Norms, and Corruption	523
Disentangling Culture from Other Institutional Causes of Corruption	525

The Difficulty of Fighting Corruption 527

Few Success Stories, but Can We Generalize?	527
---	-----

Higher Pay for Civil Servants: Does It Work?	528
Why Is Fighting Corruption So Difficult?	529
Chapter Summary	530 • Key Term 530 •
Review Questions	531 • Appendix 532
Chapter 20 Conflict	537
Theoretical Explanations of Conflict	538
Misjudging Your Rival	539
Deals That Aren't Worth the Paper on Which They Are Written	540
The Empirical Determinants of Conflict	541
Why Do Civil Wars Start?	542
Greed versus Grievance	545
What Is the Causal Link between Conflict and Development?	550
The Economic Effects of Conflict	551
The Long-Term Effects of War	552
The Long-Term Effect of Hiroshima and Nagasaki	553
The Long-Term Effects of Bombing Vietnam	554
Sierra Leone's Civil War	556
Chapter Summary	559 • Key Terms 559 •
Review Questions	559

Appendix **Econometric Appendix** 561

Some Basic Statistical Concepts	562
Mean, Variance, and Standard Deviation	562
Covariation between Two Variables	564
Bivariate Regression Analysis	565
Causal Inference	567
The Treatment Effect and Selection Bias	568
Randomized Evaluations	569
Ordinary Least Squares and Causal Inference	569
Bias from Omitted Variables	570
Panel Regressions	571
Fixed Effects and Difference-in-Differences Estimation	572
Instrumental Variables	574
A Regressions Table	577

Glossary 581

Index 593

Introduction

The economics of development is one of the most exciting fields in economics. It asks the same questions Adam Smith raised when he founded the study of economics: Why do some countries develop earlier than others? Why do some countries fail to develop while others are successful?

While we have learned a lot about what the wrong answers to those questions are, we have also made progress in recent years in finding the correct answers. Some of the most innovative advances in economics in the past 15 years have been in development economics and they have changed this field tremendously.

Two New Research Directions in Development Economics

Two notable research directions have reshaped the way we think about economic development. The first of these focuses on the fundamental role of institutions in understanding development and growth. Institutions, or the rules of the game in society and the economy, play a big role in determining how costly or inexpensive it is to pursue economic transactions such as buying or selling goods and services, or getting a loan to start a business. In some countries, institutions make economic transactions easier and establish a climate in which property rights are protected and the rule of law prevails. Such institutions have a positive effect on development. In other countries, institutions make economic transactions very difficult: property rights and investments are not protected, corruption is rife, abuse of power by politicians is the norm, and laws are either flawed or not well enforced. These institutions have a negative effect on economic development.

This undergraduate textbook is the first that comprehensively takes stock of the exciting new research that has taken place in recent years to gain an understanding of the role of institutions in economic development. We devote special chapters to particular sets of institutions—legal, political, and fiscal—as well as cultural and social norms. We examine the effect of institutions on growth, property rights, market development, and the delivery of public goods and services. Finally, we explore issues of institutional change such as democratization or property rights reform.

The second research direction that has completely changed the face of development economics is the rapid introduction of randomized evaluation of development projects. Randomized evaluation, now widely used in medical research, initially faced resistance from the medical community: people objected that if a new treatment existed, researchers should not randomly choose who might benefit from it, but give everyone access to the therapy. The disadvantage of this approach was that often only those who were the most

health conscious chose to follow the new treatment. As health-conscious people are generally healthier than individuals who are less concerned with their own health, the studies based on that population therefore tended to overestimate the effects of a particular medical treatment. Randomized evaluation is necessary to evaluate medical treatments scientifically.

In recent years, development economists have wholeheartedly adopted the randomization approach to program evaluation in development projects. Entrepreneurial development economists such as Michael Kremer at Harvard, Abhijit Banerjee and Esther Duflo at MIT, Edward Miguel at UC Berkeley, and many others have convinced nongovernmental organizations (NGOs) to use randomized evaluation to assess the effects of various development and aid programs, and answer such questions as: What is the effect of deworming drugs on school participation and learning? What are the best methods for keeping water clean and preventing diarrheal diseases? How effective are bed nets in fighting malaria? What are the most successful tools to enhance the quality of education in poor countries, textbooks, school meals, smaller class sizes, or scholarship programs? Program evaluation enables researchers to figure out which programs are most effective and which policies have the best cost-to-benefit ratio in terms of achieving the goals of health, education, and social welfare, among other measures of development. This book provides a comprehensive study of the recent research in program evaluation in development economics.

The spread of randomized evaluations in development economics has also been associated with great improvements in empirical analysis. For obvious ethical reasons, researchers cannot analyze issues such as assessing the effects of abduction and the horrors of war on child soldiers or understanding the causes of armed conflicts using randomized evaluations, nor can they use these methods to answer the “big” questions about the effects of institutions on development. Nevertheless, researchers in recent years have developed very rigorous and innovative empirical methods for answering these and other questions about the causal effects of economic, social, and political variables.

While different in their focus, research on the role of institutions and on the use of randomized controlled trials to evaluate development policies are quite complementary. Randomized controlled trials are focused on precisely measuring the effect of particular policy interventions in local settings. Research on the role of institutions is more often done in a wider setting and analyzes differences in institutions across countries and, sometimes, across regions in large countries. Knowledge of a particular country’s history is often crucial to understanding the origin and evolution of that country’s institutions. However, both of these new directions in research share a common dedication to using the highest econometric standards and appropriate empirical methods to measure causal effects.

In this book, we take a broad view of economic development. The field is not confined simply to the study of poverty and underdevelopment, but it also examines how countries become successful in development. In the last decades, parts of East Asia followed by China and India, have been experiencing significant success in economic development. It is crucial that we try to understand the reasons for their success. We pay particular attention to development in

China and we also examine various aspects of economic history to provide a historical perspective on development successes and failures.

Organization of the Book

The comprehensive and flexible nature of the book's contents is designed so that instructors may pick and choose topics according to their specific interests and they can teach chapters in the order that works best for their students.

Part I introduces all the main issues in economic development and covers traditional contributing factors such as poverty and inequality, demographic issues, economic growth, structural change, development strategies, trade, and foreign aid and debt.

Chapter 1 presents data about the development gap, the huge difference in income per capita as well as in other measures of development, between the world's rich and poor countries. It presents the core focus of the book: why some countries grow out of poverty while others do not. It includes a number of maps to present the data so that students can visualize where poverty and underdevelopment are prevalent.

Chapter 2 considers poverty and inequality and how to measure these conditions. In addition, we discuss the evolution of poverty and inequality in the world over time and some of the underlying factors that drive changes in poverty and inequality.

Chapter 3 examines population growth, which has traditionally been an important issue in development. We examine trends in population growth in developing countries and discuss the theory of fertility choices and how it applies to development. We discuss family-planning policies and the reasons why population growth has begun to slow down in developing countries, a phenomenon called the demographic transition.

Chapter 4 covers growth theory. We consider the main theories of growth, both the Solow model and the model of endogenous growth. We also discuss the empirical literature on growth, a subject that many development textbooks do not address. A very important topic in this chapter is the role of institutions in explaining long-term growth. We also discuss alternative explanations for growth such as human capital and geography.

Chapter 5 focuses on issues of structural change. We discuss the traditional Lewis model of structural change as well as the Harris-Todaro model of rural-to-urban migration. We discuss some of the development strategies from the past 50 years such as big-push theories, balanced versus unbalanced growth theories, and import substitution and export promotion strategies.

Chapter 6 discusses globalization and the important international economic issues relevant to development. We offer a simple and thorough explanation of the theory of comparative advantage, and we discuss the political economy of trade and the critical role of multilateral institutions such as the WTO in maintaining free trade agreements. We explain how the WTO's basic rules of reciprocity and nondiscrimination help to sustain and expand multilateral agreements. We also cover exchange-rate issues as well as the topics of foreign debt and aid. In particular, we discuss recent controversies about how useful foreign aid actually is for development.

Part II focuses on institutions and their role in economic development.

Chapter 7 provides precise definitions of various institutions and explains in detail how they help solve a number of important problems that occur in economic transactions. These may be informational problems relative to the quality of goods and services or the reliability of the parties participating in a transaction; commitment problems and incentives to cheat or to renege on promises; collective-action problems and the difficulties faced by communities that attempt to make decisions or take actions that benefit their members as a whole; and coordination problems and the difficulties encountered by economic agents in developing common, efficient norms of behavior. This chapter is critical to understanding, at the microeconomic level, the role that institutions play in solving the various problems that arise in transactions between individuals and within communities.

Chapter 8 examines a topic important for the role of institutions in economic development: the role of markets versus hierarchies in the allocation of resources. In all economies, some goods and services are provided through the market while others are rendered through a hierarchical command system usually run by the government. In the 20th century, some countries even tried to achieve faster development by relying on central planning instead of free markets to allocate most resources in the economy. We discuss the incentive problems in central planning and large bureaucracies, and explain why central planning proved inferior to the capitalist market system.

Chapter 9 compares political institutions in the context of development. We compare the basic political institutions of democracy and dictatorship as well as different forms of both. Political institutions have an important effect on many indicators of economic performance such as growth or the delivery of public goods and services. This chapter also discusses theories and studies of democratization.

Chapter 10 covers legal and fiscal institutions. We present comparative research on legal systems, in particular common- and civil-law systems, and their effect on the development of financial markets. Fiscal institutions are also important because it is more difficult to raise tax revenues in developing countries than in developed countries. This is particularly the case in many countries where a large part of the economy operates in the unofficial sector.

Chapter 11 studies the role of culture in development. Students are introduced to the different methods by which researchers attempt to measure culture, understood as values and beliefs. We also present results from emerging research on the effects of culture on an economy.

Part III covers the core issues that development economists have been working on. The chapters on property rights, corruption, and conflict are unique to this text.

Chapter 12 examines issues of property rights and contracts in rural contexts. It analyzes the types of land contracts that exist on different continents and their economic effects, as well as how a country's institutions can influence these contracts. We also consider the history of land reforms and their economic effects in developing countries.

Chapter 13 discusses issues of property rights in urban contexts and it explores both the effects that result from the absence of legal titles to property in many developing countries and the differences across countries in terms of

the protection of property rights. We also provide a detailed analysis of the issue of privatization policies in developing countries.

Chapter 14 considers market development in poor countries and the link between institutions and the development of markets in those countries. An important problem for rural market development is monopsony; farmers often face a single buyer who will only pay a very low price for their goods. This leaves farmers with little incentive to make investments that would increase their agricultural productivity. We also study the experience of transition economies; because free markets did not exist under central planning, the experience of these economies is useful to our understanding of how markets develop. We analyze issues of market integration as well as the obstacles to it in developing economies, and we consider famines and the market problems associated with these devastating events.

Chapter 15 looks at the role of credit markets in development. Here, we build on the issues discussed in Chapter 7. Informational and commitment problems are crucial issues in credit markets. In developing countries, the low levels of collateral and high costs of monitoring loans make these problems more serious. We discuss issues of credit constraints that firms can face and we also study microfinance, an innovative institution that has emerged to deal with some of the specific transaction costs of credit in developing countries.

Chapter 16 presents pertinent facts about health issues in development and how they have evolved over time. We explain the different ways economists measure health and we examine the relationships between health and development, health and income, and health and long-term growth. We also survey the results provided by randomized evaluations of health interventions in poor countries. In addition, this chapter discusses the issue of how to create access to cheap drugs in poor countries as well as the institutional factors relevant to the provision of healthcare services in developing countries.

Chapter 17 discusses the provision of education in developing countries and offers an overview of its progress and failures. We also survey the results of all the different randomized experiments undertaken to improve the quality of education. We discuss the various institutional problems in education such as the allocation of funds between the private and public sector; the allocation of funds to primary, secondary, and tertiary education; the persistent effects of corruption; and the educational gender gap and the programs designed to deal with this problem.

Chapter 18 examines the delivery of infrastructure in developing countries. It is difficult to attract infrastructure investment in poor countries because of their weak protection of property rights. Infrastructure decisions by politicians are not always efficient and scarce funds are often used to finance “white elephant” projects that are economically inefficient, but bring benefits to politicians. We also discuss various other problems developing countries face in relation to infrastructure investment, such as the economic effects of dams or the allocation of responsibility over infrastructure between different levels of government.

Chapter 19 focuses on corruption in the context of development. We explain the pros and cons of the measures of corruption that economists use. There is

a direct link between the quality of institutions and the level and persistence of corruption, with cultural aspects playing a significant role. We survey the research on the causes and consequences of corruption and discuss policies to prevent and eradicate it.

Chapter 20 covers the issue of conflict in development. This is an important topic that is often neglected in other textbooks. Because most conflicts since World War II have taken place in developing countries, we present both theoretical and empirical analyses of the causes and consequences of these conflicts.

For those instructors who have a strong preference for traditional development themes, we recommend beginning with Part I, Chapters 1–6, which cover standard development issues. We then recommend Part II, Chapters 7–11 for those who are not very familiar with the economics of institutions. Finally, we recommend concluding with Part III, Chapters 12–20.

For an institutional approach, you may move from Chapter 1 directly to Chapters 7–11. After covering Chapters 12–15, add one chapter from Chapters 16–18, then return to Chapters 4, 2, and 6, and end with Chapters 19 and 20.

For those most interested in microeconomic issues of development, we recommend Chapters 1–4, Chapter 7, one chapter from Chapters 8–11, and then Chapters 12–20.

For those interested in a comparative approach to development, all chapters should be of interest, but if they cannot all be covered, a possible course could be Chapters 1, 2, and 4 followed by Chapters 7–15, and ending with Chapters 19 and 20.

For those instructors who would like to focus on the political economy of development they should also be interested in all chapters, a possible order could be Chapters 1–4, Chapters 6–11, and Chapters 16–20.

There are obviously other ways to structure a course using this textbook and we have made every effort to provide ample material for a variety of approaches.

Other Specific Features

Each chapter contains boxes on numerous topics related to the chapter's content. There are end-of-chapter summaries and review questions, many of which ask students to gather and analyze relevant data using critical thinking skills.

The book contains a wealth of data and figures on all the issues covered in the chapters. It is important for students interested in development economics to become familiar with these types of data in order to develop a quantitative grasp of the main issues in development such as poverty, differences in income per capita across the world, literacy rates, and infant mortality among others.

In order to understand development issues, undergraduate students not only need to be able to read descriptive tables, but they must also be familiar with regression tables. While they need to know the basic econometric methods used in economics, they do not need to know how to perform econometric analysis (this is reserved for graduate school). They must, however, learn to

read and understand econometric tables that report results based on the most frequently used econometric techniques. We try to make this reading of econometric tables as easy as possible. In the chapters that include econometric tables, we explain the results in an intuitive way so that students can understand them as such. The book provides a special Econometric Appendix that explains some of the principle econometric concepts and methods. All the methods used in the book's various tables are included in this appendix, which is useful for students who want to know more about the concepts and methods, and a better understanding of them will be both illuminating and rewarding. However, this text was written to present frontier research in development economics in an accessible way to students studying traditional economics or other social sciences, as well as to anyone interested in understanding development.

As far as theory is concerned, our general approach has been to include mathematical models in text boxes and to provide explanations in the main text. The models in the text boxes also help students to achieve a more rigorous understanding of the economic theory and we strongly encourage students to read these boxes. Chapter 4 on economic growth is the only chapter in which models are included in the main text because it is usually difficult to understand growth theory without the use of production functions and basic models such as the Solow model. Even in this chapter, however, we try to focus on the essential components of theory and devote sufficient space to discuss the empirical literature on growth, which has delivered many new insights about economic development in the last 20 years.

Supplements

Please visit the Companion Website at www.routledgetextbooks.com/textbooks/9780321464484.

The Companion Website, by Sandra Trejos, Clarion University, features key concepts, multiple-choice quizzes, and graphing and quantitative exercises for each chapter.

The book's PowerPoint® presentation, by Jeff Werling, University of Maryland, provides instructors with a set of comprehensive lecture slides.

Acknowledgments

I am very grateful to Oleksiy Shvets who has provided extremely helpful assistance to me since I started working on this book. Oleksiy did tremendous work in helping me with data collection and presentation as I worked on the first version of the book. I would also like to thank James Zuberi, who provided great research assistance and helped me with the preparation of the overall manuscript. I also received research assistance from Brian Scholl and Sarath Sanga.

I benefited tremendously from all those who read and commented on various parts of the manuscript. Particular thanks go to my colleague Pranab

Bardhan who went through all chapters and gave me many useful suggestions. I am also very grateful to my colleague Fred Finan who helped me to improve the econometric appendix. I wish to thank the many reviewers solicited by Pearson who commented on various chapters:

Berhanu Abegaz, College of William & Mary	Michael A. McPherson, University of North Texas
David A. Anderson, Centre College	Hiranya K. Nath, Sam Houston State University
Raj Arunachalam, University of Michigan	Camille Soltau Nelson, Oregon State University
Robert Beekman, University of Tampa	Quynh Nguyen, University of Maryland
Valerie R. Bencivenga, University of Texas–Austin	Ozgur Orhangazi, Roosevelt University
Jeffrey T. Bookwalter, University of Montana	Oluwole Owoye, Western Connecticut State University
Kristie Briggs, Creighton University	Stephen Pollard, California State University–Los Angeles
Lisa D. Cook, Michigan State University	Michael A. Quinn, Bentley University
Christopher J. Coyne, West Virginia University	Bee Y. Roberts, Penn State University
Ian Coxhead, University of Wisconsin–Madison	Rati Ram, Illinois State University
Eleanor D. Craig, University of Delaware	Margarita M. Rose, King’s College
John Deal, Manchester University	Naveen Sarna, University of Maryland
Can Erbil, Brandeis University	Yochanan Shachmurove, University of Pennsylvania
Erwin F. Erhardt, III, University of Cincinnati	Stephen L. S. Smith, Gordon College
Evangelos M. Falaris, University of Delaware	Christodoulos (Chris) Stefanadis, University of Piraeus
Amanda J. Felkey, Lake Forest College	Radoslaw (Radek) L. Stefanski, University of Oxford
Andrew D. Foster, Brown University	Emma C. Stephens, Pitzer College
Andres Gallo, University of North Florida	Gordon Streeb, Emory University
Ira Gang, Rutgers University	Vasant A. Sukhatme, Macalester College
Godfrey Gibbison, Georgia Southern University	Radek Szulga, Carleton College
Chris D. Gingrich, Eastern Mennonite University	Simge Tarhan, Colby College
Abbas P. Grammy, California State University–Bakersfield	Sandra Trejos, Clarion University of Pennsylvania
Kwabena Gyimah-Brempong, University of South Florida	Evert Van Der Heide, Calvin College
Denise Hare, Reed College	Randal Verbrugge, Georgetown University
Andrew Healy, Loyola Marymount University	Nancy Virts, California State University, Northridge
Norman Hicks, George Washington University	Jeffrey Werling, University of Maryland
Seema Jayachandran, Stanford University	Lisa Wilder, Albright College
Vibha Kapuria-Foreman, Colorado College	John Willoughby, American University
Elizabeth Katz, University of San Francisco	Dean Yang, University of Michigan
Sherif Khalifa, California State University–Fullerton	Bassam Yousif, Indiana State University
Tung Liu, Ball State University	
Ricardo A. Lopez, Brandeis University	
Frank McIntyre, Rutgers Business School	

Roxanne Hoch-McCarley convinced me to write this book with Pearson. At a later stage, I received great help from Adrienne D’Ambrosio, Deepa Chungi, and Sarah Dumouchelle. Deb Thompson edited the whole manuscript in the final stage. I am grateful to all of them and all those at Pearson who worked on the book.

Finally, I wish to thank my wife, Heddy, and my entire family who put up with me and my anxieties as I was working on the various versions of the book. They are also glad that it is finished. I wish to dedicate this book to the memory of my parents Yves Roland and Mimy Leclercq, who passed away during the final revision of the book, as well as to the memory of my brother Damien Roland who worked tirelessly in his short life to defend the interests of mineworkers on all continents and who had a keen interest in enhancing working conditions in developing countries.

Gérard Roland
Berkeley, May 2, 2013

This page intentionally left blank

The Development Gap

Students who are interested in studying development economics may have various motivations for doing so. They might have idealistic motivations and want to help eradicate poverty and disease in poor countries. They may intend to work for a non-governmental organization (NGO) or an international development aid agency to achieve these goals. Better knowledge of development economics can provide more useful solutions to help the poor in developing economies. Students might also have intellectual motivations and want to understand why poverty can be so persistent and how development economics can contribute to finding solutions to poverty. Why can our planet produce enough food to feed all its inhabitants, yet hundreds of millions of people still suffer from hunger? Which economic policies work best, at the regional, national, urban, and village levels, to help people escape poverty, achieve higher living standards, receive better health care and education, and live longer? How can development economics provide answers to those questions?

There is no better way to introduce the topic of economic development than with some striking pictures. Figures 1.1a, 1.1b, and 1.1c show three different world maps produced by Mark Newman, at the Department of Physics and the Center for the Study of Complex Systems at the University of Michigan. The first map displays the landmass of the world's countries. The second map represents the size of countries as proportional to their population; for example, China and India appear much larger than on standard maps since they have populations, respectively, of 1.3 and 1.2 billion people. Japan and Indonesia also appear larger. Notice how Russia and Canada appear much smaller than on standard maps. On the African continent, South Africa, Nigeria, Egypt, and Ethiopia appear larger, while on the North American continent, Mexico also appears larger.

In the third map, the size of a country appears as proportional to its gross domestic product. Here, the United States, Europe, and Japan appear very large, and Germany appears nearly as large as China. Notice how Central and South America and Africa have become tiny.

These three maps clearly illustrate the challenges of economic development in the world. The overwhelming majority of the world's population lives in developing countries, while most economic activity takes place in a few rich countries such as the United States, Japan, or the nations of Western Europe. Most people on the planet still have very low living standards and roughly one billion people live in conditions of great poverty, surviving on less than a dollar a day. The study of economics should not, therefore, view the issues of economic development as a marginal or exotic subject. It is *the* most important economic problem on our planet and development economics thus has the potential to make a significant positive impact on the lives of people around the world.

1



FIGURE 1.1a The Actual Land Mass of the World's Countries

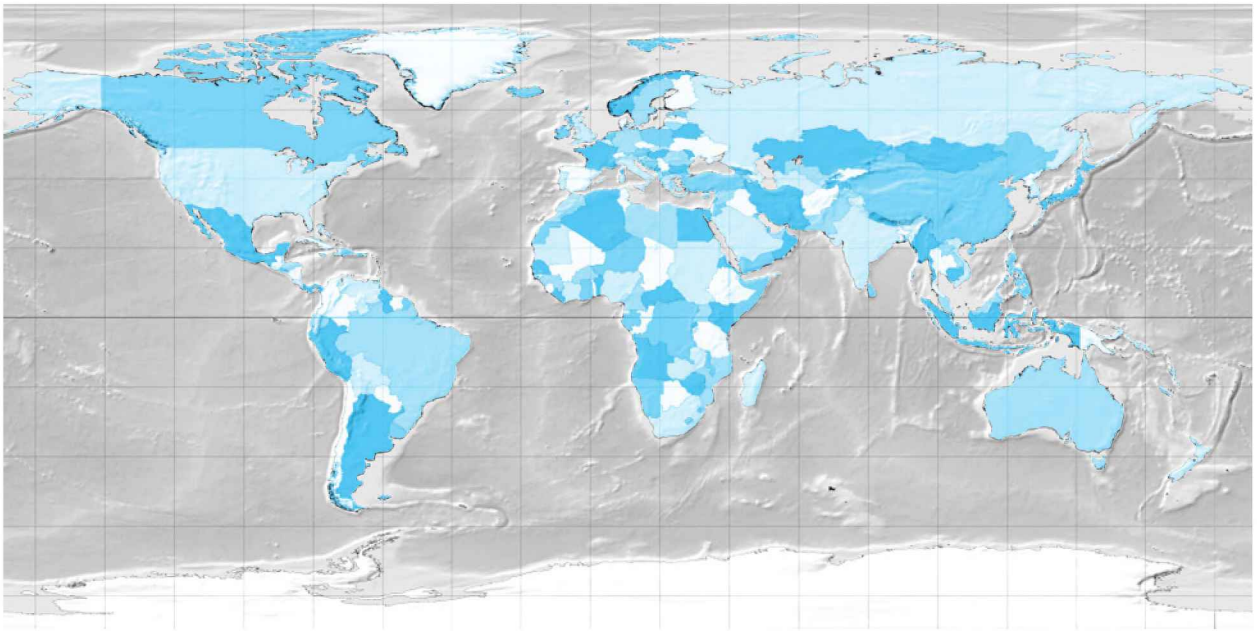


FIGURE 1.1b A World Map Representing a Country's Size as Proportional to Its Population

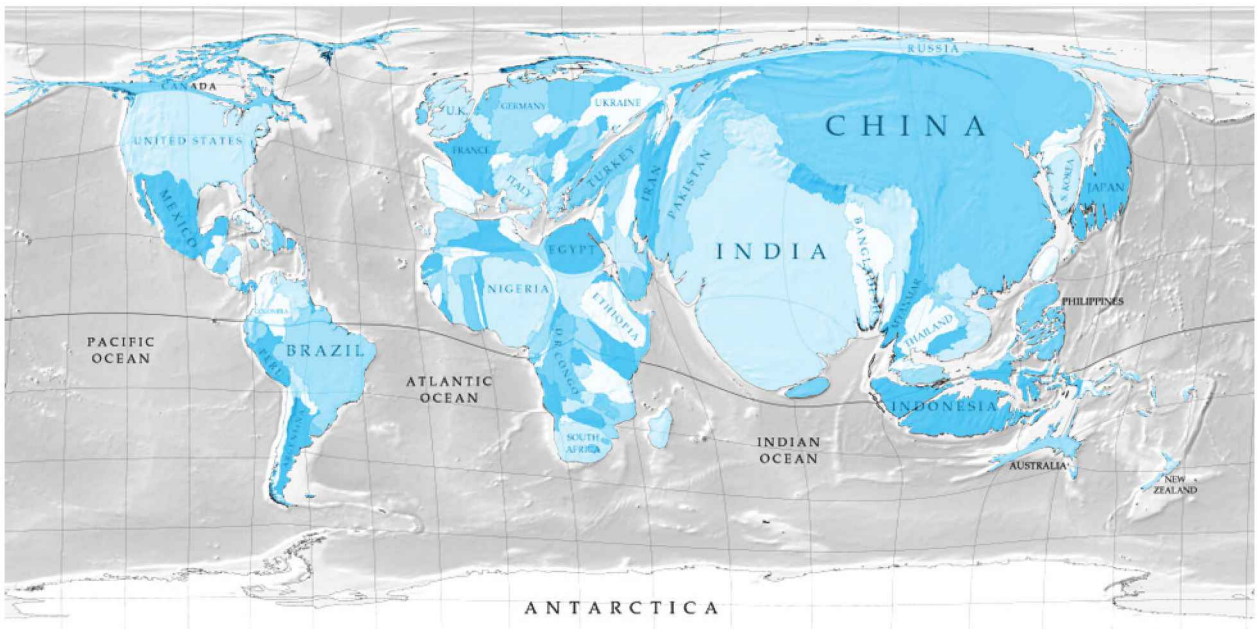
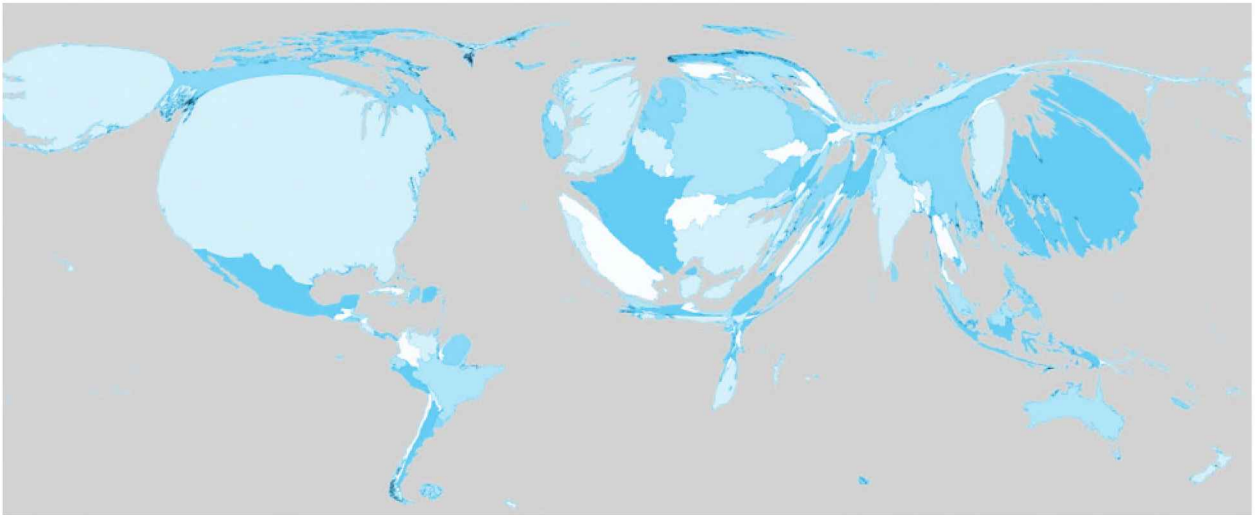


FIGURE 1.1c A World Map Representing a Country's Size as Proportional to Its Gross Domestic Product



In the first map, country sizes are proportional to their landmass; in the second map, they are proportional to their populations; and in the third map, they are proportional to their gross domestic product.

Source: Printed with permission from Mark Newman, University of Michigan. <http://www-personal.umich.edu/~mejn/cartograms/>.

In this chapter, we examine some of the most important facts about economic development and consider some of the main questions studied in development economics. We first learn about the **development gap**, the differences in economic development between the advanced economies of the United States, Japan, and the Western European nations and the poorer economies of Africa, Asia, Latin America, and Eastern Europe. We review measures of the development gap in terms of income, life expectancy, health, education, and level of urbanization, which will provide a fresh and precise perspective on the scope of the development gap between the richest and poorest countries in the world.

This gap has been evolving over time, decreasing for some countries while increasing for others. For example, in recent decades some Asian countries such as China and India have successfully undertaken a vigorous process of development and have begun to close the gap with the richest countries. Obviously there is still a long way to go, but it is encouraging to see that there are some major success stories in developing nations, and they may help us better understand why the development gap has unfortunately increased in many other poor countries. Another important fact we must consider is that development is not irreversible: rich countries can be engaged in a process of

economic decline. Argentina was among the richest countries in the world at the beginning of the 20th century, but over the next 50 years, it experienced a significant downturn in its economy. Development economists have primarily focused on the success or failure of development in poor countries; they have paid less attention to the phenomenon of the decline of countries who had already achieved success in economic development. It is critical to understand economic decline in order to prevent it.

Facts about the Development Gap

There are different ways to measure the gap in economic development between rich and poor countries. We will look at the income gap, the health gap, the education gap, and the differences in rates of urbanization across the world.

The Income Gap

The first and most obvious way to measure the development gap is to measure the income gap between developed economies and poor countries. A common measure of income is **gross domestic product (GDP) per capita**. This is a measure of the value of output produced per inhabitant of a country during a given year. Gross domestic product per capita is a good approximation of average annual per capita income. The only difference is that annual per capita income adjusts for income flowing into or out of the country, as well as for foreign aid and remittances. Of course, these can be significant for poor countries. Nevertheless, GDP is the single most widely used measure of a country's economic size. In order to compare across countries, we need to express GDP per capita in U.S. dollars (or some other common currency). In development economics, it is important to use exchange rates based on **purchasing power parity (PPP)** when converting GDP per capita in the local currency to U.S. dollars. Purchasing power parity exchange rates are based on the prices of all goods and services, and are constructed such that the same basket of goods in one country has the same dollar value in all countries.

Let us look at GDP per capita across countries in 2010 using purchasing power parity. Luxemburg is the richest country in the world with a GDP per capita of \$86,000. The world's poorest country is the Democratic Republic of Congo (formerly called Zaire) with a GDP per capita of only \$350. This is a very large difference, close to 1:250. Other rich countries include the United States, Norway, Singapore, Qatar, and the United Arab Emirates with a gross domestic product (GDP) per capita around \$50,000. Most European countries have a GDP per capita between \$20,000 and \$40,000. In contrast, 12 countries, including Congo have a GDP per capita lower than \$1,000. These include Burundi, Liberia, Eritrea, Niger, the Central African Republic, Sierra Leone, Malawi, Timor-Leste, Mozambique, Madagascar, and Togo. Apart from Timor-Leste in Southeast Asia, all of these countries are in sub-Saharan Africa. Figure 1.2 shows a map of GDP per capita based on purchasing power parity.

Comparing Per Capita Incomes across Countries Using Purchasing Power Parity (PPP) Exchange Rates

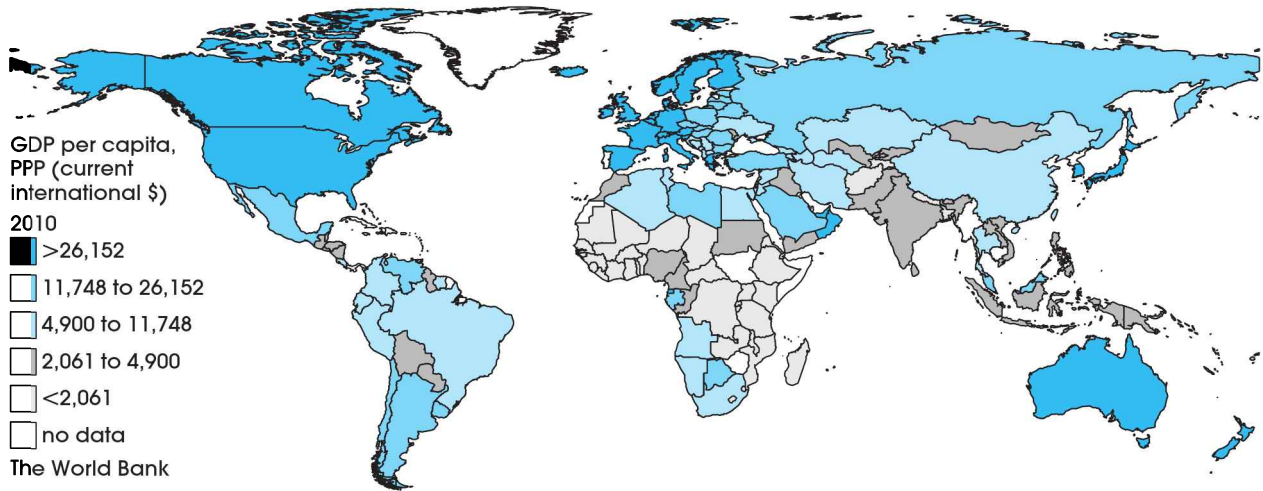
Using PPP to measure a country's GDP (or any other statistical data) means that we must use an exchange rate based on purchasing power parity instead of the market exchange rate to obtain a dollar measure of GDP for that country. The purchasing power parity measure computes exchange rates between currencies of different countries so that *the same basket of goods in any two different countries has the same dollar value*. This is difficult to do but is important for making international income comparisons. One dollar will typically buy less in a rich country than in a poor country if we use existing exchange rates. For example, one U.S. dollar was exchanged internationally in 2012 at roughly 55 Indian rupees. However, 55 Indian rupees will typically buy more things in India than will one U.S. dollar in the United States. The purchasing power parity exchange rate will thus be lower than 55 rupees per dollar, probably closer to 40 rupees or even less. The world's poorest people live on less than

one dollar a day. Even though they live under conditions of extreme poverty, they can typically buy more with one dollar in their country than a resident of New York, Tokyo, or London can purchase with that same dollar.

The reason why market exchange rates do not equalize purchasing power parity is that exchange rates are based only on the prices of tradable goods and do not take into account non-tradables, i.e., goods and services that are not traded internationally. Non-tradable goods are usually less expensive in poorer countries. Many of these non-tradable goods are services and their price is related to the cost of labor, which is lower in poorer countries. For example, the price of a haircut is usually lower in poorer countries. The technology for cutting hair is basically the same everywhere and the cost is essentially the wage of the hairdressers. A haircut is a non-tradable service because people do not typically travel across countries to get a cheaper haircut.

As we can see from Figure 1.2, most of the world's poorest countries are in Africa. South Africa is the richest country on the continent with slightly over \$10,500 per capita. However, most countries in sub-Saharan Africa are much poorer and have a GDP per capita that is closer to the \$1,000 range. Many Asian countries are still very poor; Nepal and Afghanistan have a GDP per capita of roughly \$1,200. Bangladesh and Myanmar are below \$2,000, and Cambodia, Laos, Pakistan, Vietnam, India, the Philippines, Mongolia, and Indonesia are below \$5,000.

Russia and the nations of Latin America and Eastern Europe are among the middle-income countries with a GDP per capita in the range of \$5,000 to \$15,000. Brazil, for example, has a GDP per capita slightly above \$11,000, which is around the Latin American average. Some of the former Soviet republics are quite poor. Tajikistan and Kyrgyzstan have a GDP per capita close to \$2,000, roughly the level of Cambodia. Uzbekistan and Moldova have a GDP per capita slightly above \$3,000 and are poorer than Vietnam or India. During the Communist period of the 20th century, we would not have classified Soviet republics as developing countries. However, since the fall of Communism, it is clear that many former Soviet republics are actually quite poor. Even

FIGURE 1.2 GDP Per Capita in 2010 (Purchasing Power Parity in Dollars)

The world's poorest countries are concentrated in Africa.

Source: The World Bank, World Development Indicators, <http://databank.worldbank.org>.

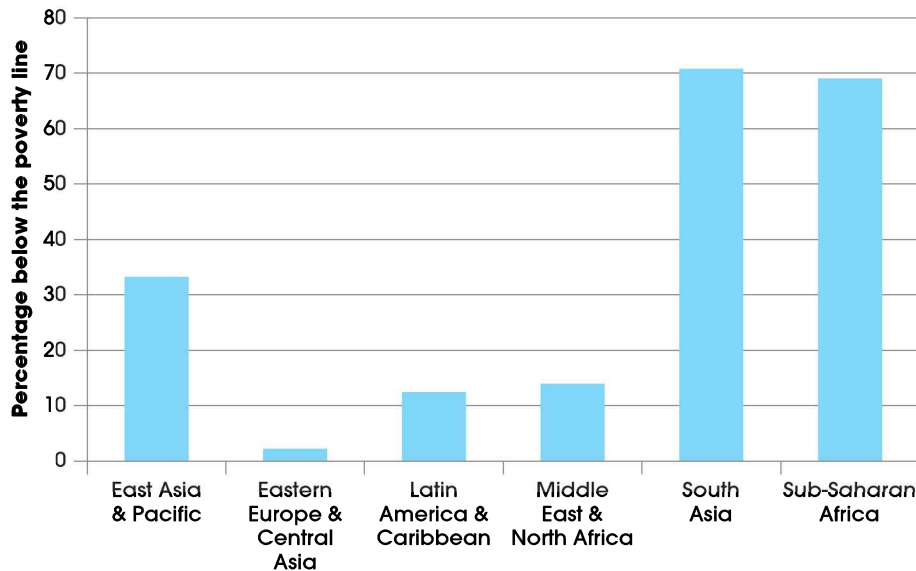
Russia must now be seen as a middle-income country with a GDP per capita of \$19,000, which is closer to that of Mexico (\$14,500) than to that of the United States (\$47,000).

The Poverty Gap

The income gap shows that an overwhelming proportion of the world population lives on less than \$10,000 a year. However, this measure does not give an accurate idea of the extreme poverty that exists in the world. Figure 1.3 shows the poverty headcount ratio at \$2 a day measured in purchasing power parity. This represents the percentage of the population that lives on less than \$2 a day and it is a measure used by the World Bank to gauge extreme poverty. We will talk more about measurement of poverty in Chapter 2. As Figure 1.3 demonstrates, slightly over 70% of the population in South Asia (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka) fits that definition of poverty, while nearly 70% of the population in sub-Saharan Africa lives below that poverty line. As a result, those two regions represent a strong concentration of extreme poverty, with 1.2 billion people in South Asia and 600 million people in sub-Saharan Africa living on less than \$2 a day. In East Asia and the Pacific, 33% of the population, or roughly 730 million people, live below that poverty line. Overall, a bit less than half of the human beings on the planet live on less than \$2 a day.

Measures of income and poverty are crucial indicators of development, but they are not the only ones. We will next look at other factors that can give us an idea of economic development and living conditions.

FIGURE 1.3 Poverty Headcount Ratio in 2008 at Poverty Line of \$2 a Day in 2005 Prices (Purchasing Power Parity)



More than two-thirds of the population in sub-Saharan Africa and in South Asia live on \$2 a day.

Source: The World Bank, World Development Indicators, <http://databank.worldbank.org/>.

The Health Gap

There is an important health gap between rich and poor countries. People in developing countries are more prone to diseases, they do not live as long as people in developed countries, and many of their children die at a young age.

Differences in life expectancy. In 2010, a child born in Japan could expect to live until 83, while a child born the same year in Sierra Leone in Africa could only expect to reach the age of 47. **Life expectancy** is defined as the average number of years a newborn infant would live if health and living conditions at the time of its birth remained the same throughout its life. It reflects the health conditions in a country and the quality of health care its people receive. Life expectancy is closely correlated with income, but it is instructive to look at the numbers on life expectancy in different regions of the world shown in Table 1.1. For each region that includes developing countries, the table identifies the countries with the lowest and the highest life expectancies. Life expectancy in North America is given for comparison.

As the table indicates, life expectancy is the lowest in sub-Saharan Africa by more than 10 years compared to South Asia, and by more than 20 years compared with other regions in the world. All countries outside sub-Saharan Africa have a life expectancy above 50, except for Afghanistan, but 11 African countries have a life expectancy below 50. As we will see in Chapter 16, AIDS is a big factor in reducing life expectancy in many African countries, but it is

TABLE 1.1 2010 Life Expectancy (Years) at Birth in Regions of the World and in Selected Countries

Region, country	Life expectancy	Region, country	Life expectancy
Sub-Saharan Africa	54.2	East Asia and Pacific	73.3
Lesotho	47.3	Timor-Leste	62
Cape Verde	73.77	Japan	83
South Asia	65.3	Latin America and Caribbean	74.1
Afghanistan	48.3	Haiti	61.8
Sri Lanka	74.7	Costa Rica	79.2
Middle East and North Africa	72.5	Europe and Central Asia	75.7
Iraq	68.5	Turkmenistan	64.9
Qatar	78.1	Switzerland	82.2
		North America	78

There are marked differences in life expectancy across the world. It is the lowest in sub-Saharan Africa where poverty is the highest.

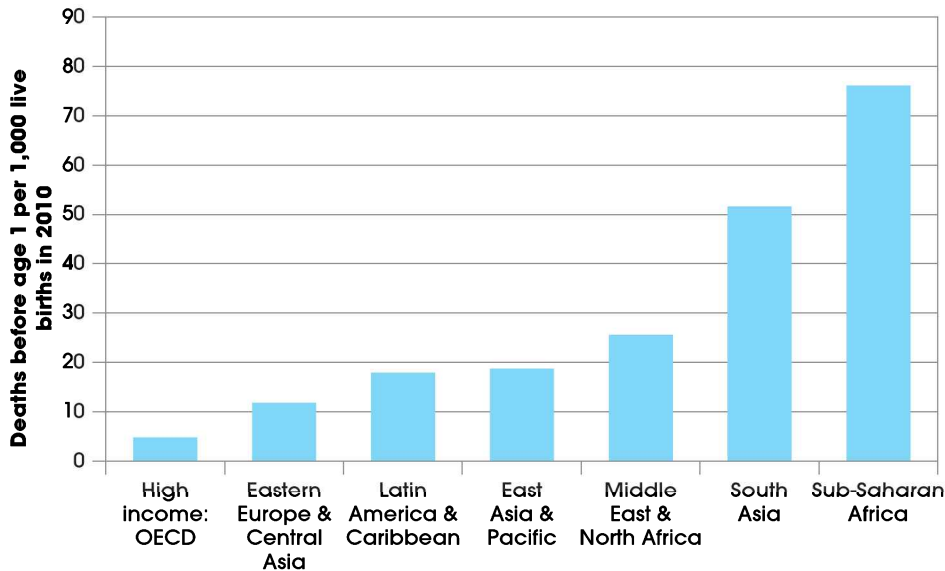
Source: The World Bank, World Development Indicators, <http://databank.worldbank.org/>.

not by any means the only factor contributing to a low life expectancy. Many mothers die giving birth, diseases such as yellow fever and tuberculosis are often fatal, and parasitic diseases and malnutrition make people more vulnerable to illness, leading to an early death.

Outside Africa, other countries with a low life expectancy are Haiti (61.8), Timor-Leste (62), Papua New Guinea (62.4), Cambodia (62.5), Myanmar (64.6), India (65.1), and Pakistan (65.2). Conversely, there are some rather poor countries where life expectancy is quite high. For example, life expectancy in Cuba (79) is higher than in Chile (78.9) and, for that matter, higher than any other country in Central or Latin America. As a comparison, life expectancy in the United States (78.2) is lower than in Cuba or Chile. In China, life expectancy is 73.3 years. Countries from the former Soviet Union have a relatively low life expectancy; Russia's is 68.8, which is lower than Indonesia (68.9). Turkmenistan has a life expectancy of only 64.9, which is below India or Pakistan. Kazakhstan has a life expectancy of 68.3, which is lower than Nepal (68.4) or the Philippines (68.5).

Differences in infant mortality rates. The **infant mortality rate** measures the probability that a child will die before reaching age 1. It is computed as the number of children dying before age 1 per 1,000 live births in the same year. One has to divide this rate by 10 to compute the probability of dying before age 1.

As Figure 1.4 shows, infant mortality rates are the highest in sub-Saharan Africa and South Asia, the regions in the world where there are also the highest poverty rates. For the sake of comparison, the figure shows infant mortality rates for high income countries that are members of the Organization for Economic Co-operation and Development (OECD).

FIGURE 1.4 Infant Mortality Rates in 2010 (Per 1,000 Live Births)

Infant mortality rates are measured as the number of deaths before age 1 per 1,000 live births.

Source: The World Bank, World Development Indicators, <http://databank.worldbank.org/>.

In Africa, Sierra Leone has an infant mortality rate of 134 per 1,000, Congo has 112, Somalia 108, and the Central African Republic has 106. These are the four countries with the highest infant mortality rates in the world. The 20 countries with the highest infant mortality rates are all in Africa, except for Afghanistan (103). Haiti has a mortality rate of 70.4 per thousand, Pakistan 69.7, Tajikistan 52.2, and Myanmar 50.4. Behind all these numbers are human dramas. Every year, 9 million children die before they have reached the age of 5, leaving grief-stricken families. Most of these unnecessary deaths could be avoided by reducing poverty and improving health care in these developing nations.

Some developing countries have low infant mortality rates demonstrating that health care policies can make a difference. Cuba has an infant mortality rate of only 4.6 per thousand, the same rate as the United Kingdom and a lower rate than the United States (6.5). Korea (4.2), Malaysia (5.6), Montenegro (7.2), Chile (7.7), Russia (9.1), Uruguay (9.2), and Thailand (11.2) are some of the other countries with low infant mortality rates.

Policy interventions can be quite effective in reducing child mortality. Between 2005 and 2010, Kenya reduced its infant mortality rate by 8% each year, perhaps the fastest reduction observed among developing countries. A key factor seems to be a policy that encourages the spread of insecticide-treated bed nets as a way to fight malaria, one of the main causes of infant mortality in tropical and sub-tropical areas. In 2003, only 8% of Kenyan households used such bed nets, but by 2008, treated bed nets were used by more than 60% of households.