

Jati Sengupta

# Understanding Economic Growth

Modern Theory and Experience

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Jati Sengupta  
University of California, Santa Barbara  
College of Letters & Science  
Dept. Economics  
North Hall 2024  
Santa Barbara, California 93106-9210  
jatisengupta@yahoo.com

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*Once I asked my dad: How should I lead my life?  
He replied: Life is a dream, make it real.  
I asked my mom the same question.  
Came the reply: God overhead, heart within.  
I dedicate this volume to my parents for all they  
taught me in life.*

*–Jati Sengupta*



# Preface

Modern economies today have undergone a dramatic change. There has been a shift from large-scale material manufacturing to the design and application of new technology with R&D and human capital. The new information age has introduced significant productivity gains through increasing returns and learning by doing. This has challenged the traditional growth models based on competitive market structures. Institutions outside the traditional markets and the genetic principle of survival of the fittest have dominated the current theory of industry growth. This volume coordinates and integrates the two strands of economic growth and development: the endogenous theory of growth and the extra-market models of evolutionary economics dominated by innovation efficiency.

A systematic treatment of the new paradigms of growth and development is attempted in this volume. The discussion is nonmathematical and nontechnical but analytic and synthetic. New paradigms of growth theory today have emphasized three basic features of endogenous growth: technology and innovations, institutions and extra-market dynamics, and core competence of evolutionary dynamics. This volume presents this new paradigm in terms of both theory and historical experiences.

Four key features of this volume are: role of innovations and human capital, impact of information technology, institutions as mechanisms of evolutionary economies, and the experiences of Asian growth miracles. Two extra-market forces are discussed here in some detail. One is the dynamic role of institutions and agencies of governance, which can reduce the large transaction costs and facilitate economic change. The second is the view of economic growth as an evolutionary process, where dynamic flexibility and creative competence play crucial roles. Traditional economic theory of growth has neglected these institutional and evolutionary systems of economic change. The present volume integrates the endogenous growth theory with the evolutionary models of economic change.

We attempt here a synthesis of modern economic theory of growth and recent models of evolutionary economics, which emphasizes the structural process of development. Growth and development complete the two phases: one complements the other.

The volume developed out of my long research in the area of economic growth and development. The microtheoretic foundations of economic growth are integrated here with the macroscopic foundations of economic change. Here nonmarket



institutions play roles as important as the capitalistic markets. The new innovations disrupt the traditional static equilibria and bring new profits, which then augment further innovations. Growth is viewed as a cumulative process. The miracles can be repeated. The mantra is to learn, coordinate, and integrate.

Santa Barbara, CA

Jati Sengupta

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# Chapter 1

## Development

How does a nation grow? What causes development? This is the basic question economists attempted to answer since 1776, when Adam Smith published the volume: *An Inquiry into the Nature and Causes of the Wealth of Nations*. Since then the theory on economic development has moved forward from the classical and neoclassical to modern schools. On the empirical side we have now available diverse cross-section data of a significant number of countries, which provide a global picture of the process of development.

Excluding the oil-rich countries economic development has followed diverse trends over time for different countries. The cross-section data of real income in these countries reveal some important characteristics of the development process.

One of the most important conclusions of modern growth theory in economics is that capital investment is key to economic growth measured in terms of real income. The Harrod–Domar model predicts this trend, and if we include both physical and human capital in the composite concept of capital, then it yields the central hypothesis of modern endogenous growth models, where it is called AK model in one variant. The AK model is called so due to the linear production model  $Y=AK$ , where  $Y$  is real output,  $K$  is composite capital, and  $A$  reflects the technology. This production function exhibits constant returns to scale. This simple AK model of endogenous growth predicts that permanent (long-run) changes in capital investment rates should lead to permanent changes in a country's growth of gross domestic product (GDP) per capita. Jones (1995) tested this central hypothesis of the AK model for 15 OECD countries over the period 1950–1938 and found no empirical evidence of this hypothesis.

In fact growth rates of GDP per capita show little or no persistent increases in the post-World War II era for OECD economies; what change has occurred is down rather than up. Two possibilities are suggested: either by some astonishing coincidence all of the movements in variables that can have permanent effects on growth have been offsetting, or the hallmark of the endogenous growth models, that permanent changes in policy variables have permanent effects on growth rates, is misleading (Jones 1995).

A second stylized fact is the East Asian miracle. Lucas (1993) called it a growth miracle and suggested policies for making such miracles. East Asia has a remarkable record of high and sustained economic growth. From 1965 to 1990 its 23 economies

grew faster than those of all other regions. Most of the achievement is attributed by a World Bank study to the seemingly miraculous growth in just eight high-performing Asian economies, e.g., Japan, the four tigers: Hong Kong, South Korea, Singapore, and Taiwan, and the three newly industrialized countries (NICs) of Southeast Asia: Indonesia, Malaysia, and Thailand. The average growth rates of GDP per capita over the period 1968–1998 are 6.9 for China, 6.7 for Taiwan, 6.6 for South Korea, 6.0 for Singapore, and 4.9 for Indonesia. This may be compared to 2.6 for India, 2.0 for Brazil, and 0.2 for Argentina. For the last 3 years, China's GDP growth rates exceeded 10%, whereas the USA achieved less than 4.5%. What are the causes of the remarkable growth episode of the NICs in Asia?

A third stylized fact is the widening gap between rich and poor countries of the world. Helpman (2004) has termed it as one of the mysteries of economic growth. In 1960 there was a bunching of regions, with East Asia and the Pacific, South Asia, the sub-Saharan Africa, and the less-developed countries (LDCs) having an average per capita income around 1/9 to 1/10 of that in high-income OECD countries. Helpman has noted an important reason for the widening of the gap.

It is encouraging how much less-developed countries benefit from R&D in the industrial countries. These benefits are even larger when measured in consumption rather than GDP units, because larger levels of R&D in the industrial countries bring about terms-of-trade improvements in the less-developed countries. Nevertheless, these results also have a discouraging side: they show that investment in innovation widens the gap between rich and poor countries. The output gains of the industrial countries exceed the output gains of the less-developed countries. We therefore conclude that investment in innovation in the industrialized countries leads to divergence of income between the North and the South (Helpman 2004).

Despite a reduction in the relative differences between many countries, absolute gaps in per capita income have increased according to the World Bank reports. Even for the NICs in Southeast Asia the absolute difference in income with high-income OECD countries widened from about \$6,000 in 1960 to \$13,000 in 1998 in terms of 1985 US dollars. The technology gap studies have shown that the domestic capability to absorb knowledge spillovers and R&D processes from abroad is a key factor in explaining growth rate differentials over the space between rich and poor countries.

Another important characteristic of the development process is income inequality. A World Bank study of 77 countries with 82% of the world's population shows that between the 1950s and the 1990s inequality rose in 45 of the countries and fell in 16. Latin-American and Caribbean countries have the world's highest income inequality. World inequality is very high. In 1993 the poorest 10% of the world's population had only 1.6% of the income of the richest.

The NICs of Southeast Asia have low Gini coefficients in the 30s, where Gini coefficient is a measure of inequality, high value indicating high inequality. China and India, the two countries with low but rapidly growing per capita incomes and large populations deserve some special mention. In China income inequality has followed a U-shaped pattern with inequality falling until the mid-1980s and rising since. The story is better in India with inequality falling until 2005 and then coming to a halt.