

BOOK REVIEWS

Development Economics: From the Poverty to the Wealth of Nations by Yujiro Hayami, Oxford, Clarendon Press, 1997, xx + 316 pp.

A keyword punctuating this work is the concept of "induced innovation." This reviewer understands the concept as follows: The sort of technological innovation that comes about depends on the factor endowment at the time that the technological innovation occurs. Technological innovation comes about because of a need to economize on relatively scarce resources. The relative price of relatively scarce resources rises which stimulates some appropriate technological innovation to economize on the scarce resources. The concept of technological innovation as used here is broad and includes institutional changes. Examples of such institutions are those of ownership over natural resources and the rights over the usage of land and water. The establishment and strengthening of these institutions comes about as land, water, and other natural resources grow relatively more scarce.

Chapter 1, "A Theoretical Framework for Economic Development," discusses the development processes of social systems, the theory of induced innovation, and the insufficient supply of public goods. The chapter also seeks to explain the transition from a hunting-gathering economy to an agricultural economy as one brought on by induced innovation. The basis of an agricultural economy rests on property rights which become established and strengthened as natural resources grow relatively more scarce. The securing of property rights in turn brings assurance of capital accumulation. The author also argues in this chapter that the undersupply of public goods tends to be a given. If these public goods (such as the distribution of private property rights) are essential for economic development, he argues that their undersupply can become a bottleneck restricting development.

Chapter 2, "A Comparative Perspective on Development Economics," presents an international comparison of economic growth, structural change, investment, savings, commodity prices, human resources, foodstuffs, and resources.

In Chapter 3, "Population Growth and the Constraint of Natural Resources," the author discusses demographic transition and presents the Malthusian and Ricardian models. Population growth is limited by the diminishing returns of the agricultural sector. These diminishing returns impede the continuous growth of the economy causing it to stagnate and fall into the Ricardian trap. The author also introduces the Lewis and Fei-Ranis models as dual economy models which incorporate the characteristics of the Malthusian and Ricardian models.

Chapter 4, "Breaking the Resource Constraint," deals for the most part with the possibility of technological innovation that can remove the limitations on economic growth. The author presents numerous examples of innovations in agriculture, and here he displays some of his best scholarship. He demonstrates the fullness of his knowledge as he depicts episodes in a variety of countries where technological advances (such as chemical fertilizers) economized on the use of land.

In Chapter 5, "Capital Accumulation in Economic Development," a number of economic growth models, such as the Harrod-Domar model and the "low-equilibrium trap" model, are set forth. Of particular interest is the author's argument that the Marxian model can explain to a large degree the economic growth that takes place during the early stage of industrialization. The chapter also carries out growth accounting tests for different countries, and the results show that at the early stage of industrialization in the developed countries, the rise in capital intensity brought an increase in labor productivity along with a rise in the capital coefficient and capital share, meaning that a Marxian form of economic growth took place. Thereafter the usual course was for a transition from growth dependent upon physical capital accumulation to one dependent on technological advances.

Chapter 6, "Patterns and Sources of Technological Progress," provides a more detailed discussion of the two phases of modern economic growth set forth in the previous chapter. Following a review of Gerschenkron's theory of borrowed technology and Schumpeter's theory of entrepreneurship, the author endeavors to explain in economic terms the concept of induced technological progress.

Chapter 7, "Income Distribution and Environmental Problems," discusses problems of income distribution and the environment which arise from the process of economic growth. The author presents results substantiating Kuznet's inverted-U-shape hypothesis, and he argues that such things as the rise in capital share, the duality in the economy, and land reform are major causes of income inequality. A particularly interesting point is that the degree of pollution demonstrates the same inverted-U-shape hypothesis as found with income distribution.

Chapter 8, "Market and State," looks at development strategy and the structural adjustment policies followed by the World Bank and the IMF. This study consistently takes the view that public goods play an important role in economic development, and that there is a justifiable place in this role for active government intervention. In this chapter, however, the author emphasizes that government can also fail, and overall he does not express a high regard for industrial policy.

In Chapter 9, "The Role of Community in Economic Modernization," the author discusses the possibilities for nongovernment organizations to supplement the functions of the market and the government. The author uses examples from villages in the Philippines and Java to show that these organizations and institutions can change as their environment changes.

Chapter 10, "Tradition and Modernization: A Concluding Remark," provides an overall summarization and presents two final points. One is the importance of borrowed technology in the economic development of developing countries. What technology should be borrowed has to be determined in light of a society's factor endowments. The other point is that there can be diverse paths to economic development.

The author's perception of economic development backed by an abundance of factual analyses is very persuasive and made a deep impression on this reviewer. But before closing I would like to make several specific comments.

One concerns the concept of induced innovation as set forth in Chapter 6. The technological conditions for innovation have not been clearly presented. Given the relative price of factor endowments and inputs, the sort of technological innovation that occurs will depend not only on the technological conditions (labor saving, capital saving, etc.) associated

with the production of the innovated product, but will also depend on the technological conditions (what could also be called the production function of technology) of technological innovation itself. To put it more specifically, if the innovation of capital-intensive goods could be carried out labor-intensively, then the development of such goods would not be limited to capital-rich countries (but production after the innovation would probably be carried on in capital-rich countries). A number of growth models that expressly consider such technological conditions of innovation have been devised.¹

A second comment concerns the author's divided pattern of using the Marxian model for the early stage of industrialization and the Kuznets model for the advanced stage of industrialization, then showing this pattern's suitability for the developed countries and the Asian NIEs. It is a very interesting hypothesis; however, it seems to me that the author still needs to provide more theoretical and factual support for his argument. It has yet to be seen if the East Asian NIEs will follow the course that the developed countries took for economic growth which has come to depend on technological progress. There is also room for closer examination of the sort of mechanisms that bring about change in the pattern of the variables shown in Table 6.1 (such as the case in the Marxian model where real wages remain unchanged while per capita income and labor productivity rise).

Thirdly, the author needs to confirm through empirical analyses whether the degree of market failure in public goods, in externalities, or in economies of scale which bring imperfect competition and externalities is sufficiently large that it cannot be ignored. There are a number of research studies showing that at present economies of scale at least in connection with the business cycle cannot be seen in U.S. manufacturing.²

These few specific comments aside, it is fortunate for the field of economic studies to now have Yujiro Hayami's broad research and expansive perception of economic development brought all together into this single new volume. The author's admirable achievement is sure to be a primary source for future development studies research.

(Tatsufumi Yamagata)

¹ In particular see: Paul Roamer, "Endogenous Technological Change," *Journal of Political Economy* 98, no. 5, part II (1990); Phillippe Aghion and Peter Howitt, "A Model of Growth through Creative Destruction," *Econometrica* 60, no. 2 (1992).

² Craig Burnside, Martin Eichenbaum, and Sergio Rebelo, "Capital Utilization and Returns to Scale," in *NBER Macroeconomics Annual, 1995*, ed. Ben S. Bernanke and Julio J. Rotemberg (Cambridge, Mass.: MIT Press, 1995); Susanto Basu and John G. Fernald, "Are Apparent Productive Spillovers a Figment of Specification Error?" *Journal of Monetary Economics* 36, no. 1 (1995); Craig Burnside, "Production Function Regressions, Returns to Scale, and Externalities," *Journal of Monetary Economics* 37, no. 2 (1996).