Preface

Professor Lim Chong Yah's S-Curve hypothesis is a simple yet highly insightful theory. By augmenting the mathematical and econometrical sophistication of the hypothesis, this book extends the S-Curve hypothesis to provide further insights into economic growth and transition. The four core chapters in this book are closely related yet distinctly different, each dealing with a separate aspect of the S-Curve hypothesis.

Chapter 2 constructs a stochastic growth model that provides the microeconomic foundation for the S-Curve hypothesis. The model is based on the technological diffusion model by Barro and Sala-i-Martin (1997) with two significant extensions: the (productivity) parameter in the model, which represents social infrastructure, is being endogenized and the probability of adverse shocks is being incorporated into it. The stochastic technological diffusion model is able to explain the various transition points outlined in the S-Curve hypothesis. The model is also able to explain why some developing economies experience economic take-off, while others do not. The model highlights the importance of lowering the cost of technological absorption in enhancing growth rates of developing countries, and lowering the cost of innovation in achieving technological leadership. The model also highlights the importance of good governance in economic development and identifies negative shocks to governance as the main cause of slow growth in the poor developing countries.

Chapter 3 employs the economic transition parameter and the variance ratio test, developed by Phillips and Sul (2003, 2005), to test for convergence of the world economy under the framework of the S-Curve hypothesis. The results show that there is no evidence of overall convergence of the world economy. In addition, while there is evidence of subgroup convergence among the elephant economies, the horse

economies and the turtle economies outside the African region, there is no sub-group convergence among the African turtle economies. While this is insufficient to conclude that there would be no ultimate convergence of the world economy, the results show that the poorest countries (especially those in the African region) are not catching up at all in the last 40–50 years.

Chapter 4 hypothesizes the accumulation of capital in an economy as it develops follows that of an S-Curve. A newly industrializing economy (NIE) would experience rapid accumulation of capital, with the growth of capital outstripping that of output, while a maturing economy would face a slow-down in capital growth. As a result, the incremental capital-output ratio (ICOR) and the average capital-output ratio (ACOR) would first increase and then gradually decline when a country ascends the development ladder. A rapidly developing economy would have high and increasing ICOR and ACOR. Cross-country data from 60 countries provides support to the hypothesis of the S-Curve of capital accumulation. In addition, a case study using Singapore's capital stock data from 1960 to 2006 also concurs with the hypothesis. The long-term causal relationship between Singapore's capital stock and its GDP was tested and found to be positive and bi-directional.

Chapter 5 applies the S-Curve hypothesis to the case studies of Japan and Singapore. Using Chow test, it is shown that Japan underwent a structural change in 1974 while Singapore underwent a structural change in 1997, as both countries began their transformation into an elephant economy. The case study of Japan concludes that the S-Curve hypothesis is able to explain the rapid growth of the Japanese economy in the 1950s and 1960s, and its eventual slow-down since the late 1980s. By comparing the macroeconomic indicators of Japan and Singapore, it is deduced that Singapore is at the initial phase of a gradual transformation to an elephant economy; the real per capita GDP of Singapore is expected to grow at an annual average of 3.5% to 4% in the next 20 years and slow down to 1.5% to 2% thereafter.