

*Growth Theory and Sustainable Development.* By BRETSCHGER (LUCAS). (Aldershot and Lyme, NH: Edward Elgar, 1999. Pp. xiv+244. £55.00 hardback. ISBN 1 84064 135 5.)

This is a very impressive volume destined to become a standard treatise in the latest attempts to combine growth theory with the issue of sustainable development. It is intended as a text for first year graduate students but the students in question would have to be highly competent in quantitative techniques for despite claims to the contrary the mathematics involved goes well beyond the norm expected of undergraduate courses in Mathematics for Economists. It is

remarkably well written combining clarity with conciseness and giving no indication that the volume has been translated from the original German. There are two main focal points. Firstly, it attempts to demonstrate how modern growth theory can contribute to an understanding of the vast differences in living standards coexisting in the world economy. Secondly, the limited supplies of natural resources carries implications for the question of whether the present rate of development will be sustainable in the future. The book's emphasis seeks to relate the theory of economic growth to predictions about this key issue. Although essentially a book on economic theory, considerable empirical evidence is included which emphasises the need for theory to be at least consistent with the stylised facts.

The starting point for the formal analysis of growth theory is the Harrod-Domar model extended to allow for a Leontief production function and consideration of the conditions necessary for a steady state solution. A critique of the unrealism of the model and the fact that none of the parameters of the model are determined endogenously paves the way for an analysis of the neoclassical model. The Solow model is invoked to demonstrate the steady state solution and exogenous technical progress. This is standard enough but very clearly done and leads on to a distinction of Hicks, Harrod, and Solow neutrality and the policy implications implicit in the Golden Rule of capital accumulation. Two excellent chapters follow on intertemporal optimisation (in which the Keynes-Ramsey rule and the Ramsey-Cass-Koopmans model are formally derived) and on positive spillovers whereby various economic activities generate (essentially as a side product), a cumulative process with positive impacts upon the overall growth rate. In this way growth becomes more of an endogenous variable, being dependent in part upon economic policy.

This naturally leads into the primary focus of the book, namely the new growth theory where long term growth is endogenously determined. The role of the public services and human capital is then analysed and integrated into growth theory. Considerable attention is given to the importance of positive knowledge diffusion stemming from the research sector. The analysis is extended to the open economy with consideration being given to the scale effects of international trade. Further extensions take account of financial markets, interdependencies between business cycles and growth, multiple equilibria, and poverty traps. This is all comprehensively dealt with on both a micro and macro level in a manner which emphasises the evolution of economic doctrine as an historical process. The final chapters of the book culminate in its pioneering conclusion which is to demonstrate how endogenous growth theory provides an appropriate framework for the analysis of sustainable development. The essential conclusion is that a profound study of sustainable growth is not possible without a sound thesis of endogenous growth theory. Development is deemed sustainable if it meets the needs of the current generation without compromising the ability of future generations to meet their own needs. This broad definition leads to quite different conclusions when distinguishing between renewable and non-renewable resources but the criterion remains firmly grounded in promoting or maintaining

individual welfare. Accordingly, environmental variables have to be added to the theory and the quality of the natural environment has to be included in the utility function one is seeking to maximise. A very pleasing feature of this volume is the use of one-page boxes included in the relevant chapters summarising recent theoretical controversies and the relevant empirical evidence. These complement the chapters in which they appear admirably and reinforce the central message in a remarkably concise manner. Sustainable development has become a key area in the development literature in recent years. This volume succeeds in integrating it with modern growth theory in a way which brings out the importance of institutional and environmental factors and highlights the relevance of the policy implications.

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