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Book review

The State of Food and Agriculture 2003/04, Agricultural Biotechnology: Meeting the needs of the poor?, by Food and Agriculture Organization of the United Nations. Published by FAO, Rome, Italy, 2004, pp xv + 209, ISBN 92 5 105079 1 (pbk), $US65.00.

Generations of farmers have been adapting to successive waves of innovations. For this generation, a major innovation that has forced farmers to re-think agricultural possibility is biotechnology. Whether the world's poor can benefit from this technology is a question that arouses passionate and conflicting views. The 'global war of rhetoric' (Stone 2002) on the vices and virtues of biotechnology has polarised debate, leaving a vacuum in the middle ground. *The State of Food and Agriculture 2003/04* (SOFA) enters this no-man's land with a comprehensive 'view from the middle' of the opportunities and concerns for the poor associated with agricultural biotechnology.[1]

The report concludes that, so far, only farmers in a few developing countries are benefiting from agricultural biotechnology, principally by improving occupational health and the environment with less pesticide use. However, with more targeted investment and better regulation, genetic innovation could do much to alleviate hunger in poor countries. Not everyone will agree with this finding, of course. On the one hand, some will argue that acknowledging potential benefits of biotechnology – including genetically modified crops – endorses a system of poor country dependency on rich countries and multinational companies (MNCs). On the other hand, some may feel that the qualified conclusion does not go far enough in emphasising the potential of biotechnology to benefit the world's poor.

Although not everyone will agree with the conclusion, the comprehensive and accessible nature of the report makes it essential reading for anyone interested in an interdisciplinary (socio-economic and scientific) analysis of biotechnology issues in the context of the rural poor. The lucid comparison between the current gene revolution and the green revolution of the 1960s is instructive for those seeking to view biotechnology in a broader historical perspective. The contrast with the green revolution made in the book – which includes a contribution from Nobel laureate, Norman Borlaug – identifies the substantive differences with today's gene revolution. The 1960s paradigm involved a co-ordinated international effort to undertake public research for public goods. Nowadays, private sector research develops proprietary technology that is traded for a price through the market. This paradigm shift means that private research alone will often neglect the needs of the poor. This trend is highlighted by the fact that the top biotech multinationals outlay $US3 billion each year on

[1] SOFA is the flagship publication of the Food and Agriculture Organization of the United Nations (FAO). SOFA consists of three sections. The first section – reviewed here – presents a thematic analysis of a specific issue of relevance to poor people in developing countries. The second and third sections provide FAO's latest statistical data on food and agriculture around the world.

agricultural research, compared to the Consultative Group for International Agricultural Research's expenditure for poor country agriculture of barely $US300 million.

The report offers two broad recommendations in response to this glaring disparity. The first recommendation is predictable. There needs to be greater focus of public resources on needs of the poor. This includes more public research on poor country crops (e.g., wheat, rice, sorghum) and poor country traits (e.g., drought, salinity, disease, pests, nutrition). The second recommendation is more novel, namely, there should be an assessment of public/private partnerships to develop pro-poor technologies. Do incentives exist, or can they be created, to allow the private sector to target its innovations for the poor? If so, intellectual property and licensing agreements should be designed to allow private innovations to be used by the public sector.

The consideration of public-private partnerships will no doubt raise the hackles of those who oppose biotechnology on political-economy grounds. Some non-governmental organisations (NGOs) may have felt that the report should have used the opportunity to chastise MNCs, rather than consider their role as partners for the poor. In the eyes of some NGOs, the concept of public-private partnership stands in stark contrast with the perception that MNCs are the problem with biotechnology, not part of the solution.

One of the issues not stressed in the report is in relation to market access and technical barriers to trade by some rich countries. For example, Anderson and Jackson (2004) found that when poor countries impose bans on GM crop imports in an attempt to maintain access to EU markets for non-GM products, the loss to poor consumers is far more than the small gain in market access to the EU for poor farmers. For poor countries – where food security is more important than perceptions of food safety – protectionist barriers to adopting crop technologies sacrifice potential advances in agricultural productivity, and cost lives.

While some oppose biotechnology outright, others contend that if its potential benefits are exaggerated alternative innovations may be overlooked. SOFA recognises that biotechnology should '... form part of an integrated and comprehensive agricultural research and development programme that gives priority to the problems of the poor. Biotechnology can complement but not substitute research in other areas.' (p. 22). Furthermore, it warns that 'biotechnology cannot overcome gaps in infrastructure, markets ... and extension services that hinder all efforts to promote agricultural growth in poor remote areas.' (p.106).

The message that emerges is that agricultural biotechnology is not a panacea for farming viability or world hunger but it is a potentially valuable tool to have in an overall toolkit for alleviating rural poverty. In the context of a generational debate driven more by emotion than evidence, *The State of Food and Agriculture 2003/04* stands out as an invaluable fact-based review for anyone with an interest in alleviating hunger and poverty.

References

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The Dynamics of Innovation Clusters: A Study of the Food Industry, by Magnus Lagnevik, Ingegerd Sjöholm, Anders Lareke and Jacob Östberg. Published by Edward Elgar, Cheltenham, UK, 2003, pp. X + 213, ISBN 184376 367 2 (hdbk), £55.00.

The focus of this book is innovation and its encouragement and facilitation. The domain is the European food-producing sector. The empirical work reported in the book has been financed by the Knowledge Platform for the Food Industry (KLIV), which is funded jointly by the Swedish food industry and the Swedish Government.

The authors argue that developments impacting on the food market and food chain signal the coming demise of food producers in Europe who persist with a commodity orientation. It is argued that various combinations of low labour costs, good natural conditions for farming and scale economies mean that commodity production is the province of some developing countries, Eastern Europe, North America and Australia. Instead, Europe needs to pursue high-value-added food products.

The challenge for European producers is that, according to the EU Green Paper on Innovation, product and process innovation has been low across all sectors of the (European) economy and the food industry is a clear instance of a key weakness: the poor adoption and commercialisation of new knowledge.

Little economic analysis informs this context-setting material. Because the book is mainly to do with optimal processes and institutions for lifting innovation, rather than incentives for doing so, perhaps this does not matter. It is assumed, as noted above, that the incentives are irresistible.

The book is grounded in selected innovation strategy literature, with a good dose of the sociology of consumer behaviour, rather than economics. This fact, coupled with the intensely detailed narratives of three food innovations, will frustrate many AJARE readers. Indeed, it is not clear for which readership the book is intended. My judgement is that the book would be of most interest to those managers of food-processing firms who share the authors' perception of significant contextual change and consequent need for major strategic re-orientation in the food sector in Europe.

A central theme in the book, and the element suggested to be the 'main contribution' of the book, is the proposition that innovation and product development are different processes and that different structural/institutional contexts seem to be optimal for each. This posited distinction is not apparent in mainstream marketing and strategy literature and, away from the food sector, the distinction is unlikely to travel well. The food sector is more bounded in its possibilities for product innovation by the nature of its inputs than most other sectors. (Marketers may suggest that this is more perceived than real and is simply a function of firms in the sector defining themselves in terms

of inputs rather than outputs. They might be unkind enough to suggest, as well, that persisting in this mode of thought bounds unhelpfully the exploration of new futures.)

'Product development' is an unusual term to use. 'New product development' is the rubric usually employed, with the possibility of various degrees of innovativeness being manifest in the outcomes of the process. The theme seems, as a result, to have a straw-man character to it (with product development defined as being free of any innovation that is new to the firm). This categorical, rather than continuous, approach helps the linking of different structures to the two processes but undermines its credibility. The essence of the claimed structural implications, which are not directly researched here, is that innovation inevitably struggles within the boundaries of a single firm.

The reference to clusters in the title should not be inferred to indicate strong promotion of the cluster model. These are networks of organisations, physically close to each other, with diverse relevant capabilities. The case studies are mined to identify what capabilities, and changes in member roles, seem to be most consistent with innovation discovery and commercialisation. The principal interest is strategic leadership through the innovation process. From a broader perspective, one can describe the investigation as an exploration of the detail of operation of one cluster dealing with three different innovations. These are ProViva (a functional food), an oat-based milk and a preservative-free carrot juice with a reasonably long shelf life.

There is a considerable body of literature on the appropriateness of various organisational arrangements for, inter alia, the encouragement of innovation. In this, structural considerations are subordinate to a broader definition of the nature of organisations normally called 'character' (Kast and Rosenzweig 1974). Organic or organismic character is understood to be preferred to mechanistic character where creativity is sought. Structure is one, not necessarily binding, determinant of character. However, there is no reference to organisation character in this book.

As a result, the authors report an investigation that is more exploratory in intent, and less informative in outcome, than it may need to have been. A more general model of productive features of organisational settings where creativity is sought may have been constructed if the cluster-based analysis had been assessed against organisation design criteria derived from existing literature. The focus on strategic leadership may also have been assisted by a grounding in this material as well as mainstream leadership literature.

The authors, as the investigation they report, attempt much in this book. They attempt to reveal the nature and magnitude of the task facing firms seeking to vault from a 'commodity orientation' to a 'product orientation', in the current argot in food marketing circles. Appropriately, they identify institutional changes needed to achieve this, but arguably, overstate the case.

Innovation is defined in the book as, paraphrasing, a product or process that is new to the world. That is, it is new both to customers and the producer. This is not mandatory for a shift to product orientation, value-adding or market niching. It is one approach but a risky one. The emphasis on innovation within a cluster (rather than a single organisation), and the classification of product development as pedestrian activity, rather implies that radical innovation is inevitably the focus here. It can be argued, though, that radical innovation is quite rare and that, mostly, 'imitative

innovation' is what firms do: existing knowledge is employed in new ways that create valued differentiation.

Ultimately, this reader is left pondering the problem that is sought to be addressed by this study. I believe it is the maximisation of the openness of food firms to relevant invention. Or one might say 'ensuring the commercial exploitation of value-adding innovation'. To an economist this begs a few questions. To a manager it does as well. In both cases, the salience of objective functions (or how do profit and innovation connect) and maximisation versus optimisation are central.

At times the authors fall to admonitions that firms 'must' or 'must not' do this or that. This didactic tone is consistent with the weak awareness of current organisation theory through the work; 'must' bespeaks a level of knowledge yet to be attained. It reveals excessive confidence in the generalisability of the results of the case study analyses.

The value of ethnographic work such as this relies a lot on the appropriateness of the conceptual frameworks that are laid out for the work to inform. Those employed here seem to cause the work to focus on one, quite narrow, path among a number that are available for food firms wishing to detach themselves from the current commodity character of their throughput. Patentable innovation is a much less common source of added value in products than is synthesis of existing ideas

Moreover, there is a market reality that may give pause to those who seek better futures for commodity producers: many previously branded products, both food and non-food, in the mundane everyday consumption category are becoming commodities. This has resulted from value-adding innovation, principally by wholesalers and retailers. This indicates that the market returns from innovation and product development may not be as large or as durable as the authors appear to assume.

Reference

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Economia: New Economic Systems to Empower People and Support the Living World, by Geoff Davies. Published by ABC Books, Sydney, Australia, 2004, pp. xiv + 498, ISBN 07333 1298 5 (pbk), $A39.95.

Economia is an ambitious and courageous book. Ambitious because its twin objectives are to demonstrate the defectiveness of contemporary economic systems and to demolish neoclassical economic modelling of these systems. And courageous because the author is a geophysicist (but, then, Marshall was a physicist). A passing acquaintance with *Economia* is worthwhile because it will undoubtedly become a fashionable means to berate neoclassical economists.

The objectives of Part 1, 'Pseudo-Science', are to dispute 'that unfettered competitive markets provide the best mechanism for running an economy', that GDP is 'a valid

measure of our quality of life', and that the 'banking and monetary system is part of the natural order of things' (p.15). These are also constant themes throughout *Economia*. The ideological support for a capitalist economy is argued to be 'neoliberalism', which 'advocates values that accord fairly closely with the neoclassical [economics] approach' (p.14); indeed the latter 'supposedly justifies neoliberalism' (p.15). Neoclassical economic theory is first identified with perfect competition, and subsequently with general equilibrium theory of the Arrow-Debreu kind (p.34). Davies' agenda is to demolish general equilibrium theory thereby dealing a fatal blow to neoclassical economics and consequently neoliberalism (chapter 4). His attack focuses on demonstrating the existence of general economies of scale.

Part 2, 'Complexity and the Web of Life', is an extended discussion of systems, focusing primarily on natural (especially physical) systems, which are non-teleological, rather than human systems, which are purposive. Part 4, 'Learning from Life', is partly an amplification of Part 2 and partly metaphysics. Part 3, 'Global Dysfunction', combines eclectic observation of some of the shortcomings of contemporary economies, and variables that are used to analyse them. Part 5, 'Stressed Planet', is a short (27 pages) review of global anthropogenic environmental impacts.

Part 6, 'First Steps', contains pleas to acknowledge that further improvements in efficiency are always possible, that values are important in economies ('Thus an economic system should be an expression of a society's collective spirituality', p.271), and that economies have positive and negative incentives (feedback loops in systems language). Part 7, 'Malign Money', is a relatively long (70 pages) discussion of money and banking systems. A flavour of the thinking is revealed on pages 315–316 where it is asserted that lending against (bank) deposits – 'debt-burdened, fractional reserve money' – is a fraudulent practice. Part 8, 'Living in Gaia', is first, a discussion of how changing monetary systems will lead to improved economies and, second, how better incentive systems (which may involve eliminating perverse incentives) may improve economies.

What might be made of all this? In Part 1, for example, the attack on general equilibrium (GE) theory through the allegedly fatal flaw of requiring constant returns to scale seems to me to flounder because Davies does not carefully distinguish between diminishing marginal returns, returns to scale, returns to size and scope, and the effects of technological change.[1] He also asserts that '*the effects of economies of scale are excluded from the standard theory* of free-market economics' (p.13, original italics), which is not quite how I remember my undergraduate economics. Even if Davies' demolition of GE were successful, all neoclassical economics does not necessarily stand or fall with GE. Like Grand Unified Theory in physics,[2] GE is a holy grail; there is much pragmatic neoclassical economics beyond GE,[3] comparable to the pragmatic physics, which Davies approvingly notes (p.74). In discussing 'Self-organisation' in

[1] '... the wreckage strewn by pervasive economies of scale is 'that of the greater part of general equilibrium theory'. On this ground alone, the neoclassical theory fails, and fails comprehensively, as a useful description of a modern economy.' (p.46).

[2] For example, http://pdg.web.cern.ch/pdg/cpep/grand.html

[3] Of approximately 700 *Journal of Economic Literature* classifications, not all of which are neoclassical, few mention GE nor depend on it.

Part 2, only in the last three pages of Chapter 7 does Davies acknowledge that Adam Smith's 'invisible hand' is a self-organising system. However, while neoclassical economics 'only describes the simplest form of self-organisation' (p.99), none of the other social systems described in Part 2 involves a model with anywhere near this degree of complexity.

There are several oddities in Part 5 ('Stressed Planet'). One concerns 'escape routes' from the impact of growing populations on natural resources (pp.252–253) where there is no mention that population growth rates are lowest (and may be negative) in developed economies. Of course, pressure on resources also arises from rising per capita consumption and waste disposal; Ehrlich had that down pat. A second is that, in approvingly quoting the 1997 economists' statement on climate change (pp.259–260), Davies overlooks that the organisers and Nobel Laureate signatories were neoclassical economists. Indeed, two of them – Arrow and Debreu – were principal objects of his attack on general equilibrium theory in Part 1.

In Part 6 it is not recognised that – while many options for improving efficiency are possible *ex ante* – retrofitting existing capital can be very expensive, and information itself is a costly economic good. Chapter 23 is an extended discussion of the iniquities of the national accounts system, without acknowledging that (a) national accounts are simply accounts and do not measure economic values, and (b) economists and statisticians have recognised these deficiencies and have been investigating how to better account for all resource use.

Finally, it is ironic that in Part 8 one cited example of the desirability of eliminating perverse incentives concerns European agricultural subsidies, given the enormous effort by neoclassical economists in organisations like the Australian Bureau of Agricultural and Resource Economics to highlight the perverse economic effects of these subsidies (and those in other western developed countries). Similar ironies include the approving references to Pigouvian taxes (p.427) invented by arch neoclassical economist A. C. Pigou, and to tradeable emission quotas, which are also firmly within the neoclassical economics canon.[4]

None of these criticisms of *Economia* should be taken as implying that (market) economies or (neoclassical) economics are perfect. Far from it. However, it seems to this reviewer that the ambitious program Davies set himself is ultimately unsuccessful for two reasons. First, insufficient care is taken in distinguishing between economies and economics. Second, the (neoclassical) economics literature of the past two centuries is simply too vast on which to land a single killer blow.

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Institutional Change for Sustainable Development, by Robin Connor and Stephen Dovers. Published by Edward Elgar Publishing, Cheltenham, UK, 2004, pp. ix + 251, ISBN 184376 569 1 (hdbk), £59.95.

[4] See also 'Conventional economics considers clean air to be worthless, so polluting wastes can be released into it with impunity' (p.27), which confuses 'economy' with 'economics'.

The title of this book captures the key issues to be reviewed. These include questions about whether sustainable development is only achievable with institutional change, whether current institutions are appropriate, and what role institutions play in achieving sustainability. Robin Connor and Stephen Dovers address these issues by providing a comprehensive historical background and emphasising the importance of establishing the right institutional mix to achieve sustainable development. Illustrated with five international case studies that detail how different countries have attempted to address sustainable development, they reason that achieving the ideal that is sustainability is not so much a destination but a process– and a long-term process in that.

The notion of institutional change and the importance of appropriate institutional arrangements have had a prominent place in policy debate over the past decade, but it has not been clear whether the body of sustainability literature has framed a coherent plan of action for governments and other policy-making bodies. There is an inherent assumption that current institutions have not achieved the desired or promised sustainability outcomes, and hence, require change.

The book is divided into three parts that comprise eight chapters. Part 1 commences with a definition of 'institutions' and outlines a systems perspective, which can be used to evaluate how particular institutional arrangements may or may not be more effective in addressing sustainability policy and implementation. The interdependence of normative and institutional change and the role of legal change are also highlighted. The notion of bounded rationality is presented, with some discussion on the concept of ecologically sustainable development in the Australian context. The importance of learning from past experiences and the manner of judging successful examples of institutional reform based on selected case study examples is also raised. The authors develop a framework and criteria for the choice of case studies in institutional change and explore the potential lessons that may be learned from them.

In part two, the authors present the background, historical context and discussion on five case studies that lie at the heart of the discussion on institutions and sustainable development in the book. The first case outlines the European Union's (EU) contribution to environmental policy and reforms. The authors detail the various Environmental Action Programmes (EAP) and constitutional affirmations of sustainable development (in the Maastricht Treaty in 1992 and the Amsterdam Treaty in 1996). They argue that European environmental policy has evolved around the acceptance of sustainability as a process rather than a goal to be reached in a given time frame. The current EAP6 (2000–10), together with the EU Sustainable Development Strategy, are presented as evidence that the EU is progressing the environmental agenda by providing leadership for normative change. There is a good discussion of the role and linkages between the EU governance institutions including the European Parliament, Council of Ministers, and the Commission of the European Communities. Other issues covered include the critical issue of how sustainability goals will be maintained with expanded EU membership, when disparate levels of economic development are involved and concerns exist about translating EU policy intent to national laws of member states.

The second case study presented New Zealand's Resource Management Act 1991 (RMA), which represented a significant attempt to develop a legislative instrument for integrating the management of land, air and water resources under a single law. The

authors discuss the Resource Management Law Reform process taking into account the historical significance of the Treaty of Waitangi (New Zealand's founding Constitutional document), followed by an overview of the local government reforms. The complexity associated with integrated environmental administration is examined, and problems of inconsistent interpretations of the integrated environmental management provisions of the RMA, coupled with a lack of central government guidance, are also discussed.

The third case study involves a review of different country experiences with establishing National Councils for Sustainable Development (NCSD) resulting from the World Commission on Environment and Development Agenda 21 initiatives. The authors classify NCSD as relatively recent phenomena, with not many countries establishing such a body, and some countries such as Australia and the USA disbanding their equivalent body after a relatively short existence. A summary on the background and current role of equivalent bodies in Belgium, Canada, Ireland and the UK is also presented.

The next case study involves discussion of Strategic Environmental Assessments (SEA) as a mechanism for policy integration for achieving sustainable development. They were developed as a consequence of perceived inadequacies of project-specific Environmental Impact Assessments. An overview of the development of Australian legislation to incorporate environmental protection in planning is outlined, highlighting the discretionary provisions for undertaking SEA that are often not used. The authors state the importance of a political environment conducive to promoting policy integration through SEA and cite how it took over a decade in the EU for SEAs to move from being a proposition to a directive.

In the final case study, the authors investigate property-rights-based policy reform to transform the nature of relations between individuals and resource use. They are cautious about property rights being a suitable vehicle to achieve sustainable development. The role and influence of social parameters such as culture and history in the development of stable and adaptable institutions is outlined to emphasise the complex issues that might impact on property rights. The authors also illustrate theoretical concepts such as public trust doctrine as applied to fisheries and the problems and constraints to achieving and maintaining socially optimal pollution. They argue that it is important for policy makers and wider stakeholder groups to understand all the implications of transforming property rights before using these as mechanisms to achieve sustainable development outcomes.

The final part of the book comprises a concluding chapter that provides a synthesis and overview of the many issues raised in the case studies, and explores their application to the conceptual framework established in Part 1. Conceptual and practical principles are drawn from the case studies and positive themes presented that may facilitate institutional change for sustainability.

Given the consensus the authors draw from the literature that sustainable development requires significant institutional reform to drive changes, and that inappropriate institutional arrangements are themselves a major barrier to achieving desired sustainable development objectives, the authors present a logical and adaptable conceptual framework for understanding the complex institutional dimensions of sustainability,

underscoring the linkages between institutional change and policy-relevant learning. The authors call for a reiterative process such as the European EAP model, which comprises an interim review of progress and reaffirmation stages. They advocate constitutional commitment to the sustainability agenda followed closely by active implementation of provisions as the key mechanisms to achieve desired outcomes.

A key difficulty with the arguments presented is that there is little critical appraisal of the net benefits available from pursuing sustainable development goals, particularly when the centralised mechanisms used to achieve it may be very expensive. Sustainable development is presented more as a normative ideal than a clearly defined objective, which helps to explain why there is more emphasis on process rather than outcomes. The endorsement of centralised government controls to achieve sustainable development outcomes, as in the EU model, reflects the authors' acceptance of sustainable development as always being a desirable outcome no matter the costs involved.

There is some tacit acceptance of the problems involved in using centralised government controls to achieve sustainable development processes. The authors admit that a reiterative process occurs over a long-term horizon, but argue that there is generally wide acceptance of the ideals of sustainable development internationally. However, while endorsement is one thing; serious implementation is another. Putting sustainable development into practice is more difficult than just agreeing with the policy principles, as is demonstrated in the case studies presented in this volume.

In summary, this book is valuable as it promotes further reflection on the institutional dimensions of sustainable development and the reiterative relationships between policy and institutional domains, which are usually difficult to identify accurately. The comparisons between case studies allow the authors to develop a broader picture on the current and future role of institutions in sustainable development. The book provides excellent material that will be of interest to students and policy-makers interested in environmental resource management and the broader sustainability discourse. However, readers should maintain some critical reserve about the key thrust of the book that current institutions need major reform to achieve sustainability outcomes.

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Nonlinear Time Series: Nonparametric and Parametric Methods, by Jianqing Fan and Qiwei Yao. Published by Springer-Verlag, New York, USA, 2003, pp. xix + 551, ISBN 0 387 95170 9 (hdbk), $US89.95.

This book offers a modern coverage of parametric non-linear and non-parametric time series models and methods geared toward researchers in a range of disciplines. The book will particularly appeal to those in the economic sciences and financial engineering who have a solid background in linear time series models and methods. The authors provide an excellent guide to the application of non-linear time series models and methods in different disciplines, including climatology, economics, finance and medical sciences, focusing on models and methods that are of current interest to practitioners.

This book is also valuable as a reference, mainly because the theorems and their proofs are written in an extremely clear manner. Except for Chapters 1 and 3, each chapter of the book includes useful bibliographical notes. This makes the book easy to read. It may be appropriate for postgraduates with a graduate-level background in linear time series, but is not appropriate for undergraduates.

The book has 10 chapters. Each chapter begins with an introduction that provides a very good summary of the main models and methods introduced in the chapter.

Chapter 1: the 'Introduction' provides some popular time series data to demonstrate both the form of the data and possible non-linearity issues. The authors include a summary of some simple but important parametric linear and non-linear as well as non-parametric time series models.

Chapter 2: 'Characteristics of Time Series' focuses on the inclusion of some probabilistic concepts and definitions for stationary and mixing processes. The authors then include conditions for the verification of stationary and mixing properties of some important models, such as certain autoregressive conditional heteroscedastic (ARCH) models. Estimation procedures of autocorrelation and partial autocorrelation functions are discussed and illustrated through using simulated examples. The authors also briefly discuss the estimation of spectral density functions of short-memory and long-memory processes using the periodogram approach. The chapter concludes with a useful central limit theorem for partial sums of stationary and mixing processes and its application in proving certain asymptotic properties of the proposed estimators.

Chapter 3: 'ARMA Modelling and Forecasting' gives an account on existing model estimation and selection procedures for autoregressive moving average (ARMA) models. The conventional Gaussian maximum likelihood estimation procedure is discussed in some detail. For modelling and forecasting purposes, the authors summarise the famous Akaike's information criterion and Bayesian information criterion and then implement such criteria using simulated and real sets of data. Particular emphasis is given to linear forecasting.

Chapter 4: 'Parametric Nonlinear Time Series Models' provides a quite comprehensive summary of both traditional parametric non-linear models, including threshold models, and some recent developments in parametric non-linear ARCH and generalized-ARCH (GARCH) models. The account of modern ARCH and GARCH processes and their corresponding probabilistic properties is excellent. Both the estimation and testing procedures for the proposed ARCH and GARCH models are discussed in detail and then illustrated using simulated and real sets of data. The chapter concludes with some useful bilinear models as well as relevant properties of the models and their estimation procedures.

Chapter 5: 'Nonparametric Density Estimation' summarises useful results in nonparametric density estimation for both independent observations and dependent time series, which is useful background for the material on kernel smoothing of time series in Chapter 6.

Chapter 6: 'Smoothing in Time Series' applies recently developed non-parametric techniques to the estimation and testing of both conditional-mean and conditional-variance functions of non-linear time series. Both the traditional kernel method and modern local linear kernel approach are introduced, together with a good summary

of some other non-parametric estimation techniques, such as spline methods. The chapter includes detailed discussion and comparison among the use of the different non-parametric techniques, such as kernel, local polynomial and spline methods.

Chapter 7: 'Spectral Density Estimation and Its Applications' looks at dealing with time series from a point of view of spectral density estimation. The authors discuss several estimation methods, such as the periodogram approach, automatic estimation, least-squares estimation and local-maximum-likelihood estimation of spectral density. The proposed estimation methods are studied theoretically and also implemented using simulated and real examples.

Chapter 8: 'Nonparametric Models' extends the discussion in Chapter 6 to more advanced models and techniques. The inclusion of some recently proposed non-parametric models, including varying-coefficient models, is particularly interesting and useful. To the best of my knowledge the authors are among the first to present such a comprehensive review of the newly proposed models and corresponding estimation procedures. The chapter demonstrates how these models can be used in practice to provide solutions to problems that may not be solved using existing models and techniques.

Chapter 9: 'Model Validation' gives a recent account of various model specification and validation procedures. This chapter will be useful to the reader interested in non-parametric inferences. It introduces several non-parametric specification procedures for the validation of particular parametric non-linear models.

Chapter 10: 'Nonlinear Prediction' complements Chapter 3 in the field of time-series forecasting and prediction from a non-linear point of view. The authors look at three types of predictors: point predictors, predictive intervals and predictive distributions. They establish some asymptotic properties of the proposed prediction procedures and demonstrate their implementation in practice using simulated and real examples.

Apart from using this book as a reference for research, I would use some parts of it for postgraduate teaching, particularly, Chapters 6 and 8. I would recommend it to postgraduate students who are interested in learning about recent developments in non-linear and non-parametric time series modelling as well as in understanding the use of complex parametric non-linear and non-parametric time series models in practice.

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