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This book investigates the way in which tax systems affect economic efficiency and the distribution of welfare. It examines within a unified framework questions that are usually treated in different areas of the literature: institutional economics, positive economics, normative economics, and political economics. It adheres to the rigorous standards of pure theory while paying careful attention to the policy relevance of the arguments. Tax systems are viewed as information extracting devices that generate sets of equilibria of complex geometry. A tax reform methodology is proposed that sheds light on optimal taxes. Social conflicts in the determination of taxes are shown to have effects on social cohesion.

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PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE
The Pitt Building, Trumpington Street, Cambridge, CB2 1RP, United Kingdom

CAMBRIDGE UNIVERSITY PRESS
The Edinburgh Building, Cambridge, CB2 2RU, UK http://www.cup.cam.ac.uk
40 West 20th Street, New York, NY 10011-4211, USA http://www.cup.org
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

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First published 1995

First paperback edition 1998

Printed in the United Kingdom at the University Press, Cambridge

Typeset in 10/12pt Monotype Times New Roman [SE]

A catalogue record for this book is available from the British Library

ISBN 0 521 23689 4 hardback
ISBN 0 521 62956 X paperback

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Foreword

This book attempts to contribute to what Walras called 'théorie pure' (in opposition to 'économie appliquée'). 'Pure theory' focuses attention on stylized models in which some features of the real world are ignored while others are accentuated. Choosing the appropriate idealized features on which to focus attention is a part of the modeller's art: the construction should be amenable to the analysis and attract attention to some key elements of real world mechanisms. Also, the collection of polar models of pure theory should define a set of anchoring points, a basis (in the usual sense of the word as well as in analogy with the sense of linear algebra) for analysing and recomposing the various dimensions of the real world's economic complexity.

With these criteria in mind, this book clearly is (or attempts to be) a 'contribution to the pure theory of taxation'. It analyses an idealized world where public policies in general, taxation in particular, are simply constrained by incomplete asymmetric information. Clearly the understanding of complex realities eventually will have to appeal not only to the teachings of this model, but also to the analysis of other stylized models. But, in line with the pure theory options, attention is here voluntarily restricted to one polar world.

A vivid tradition of normative economics is associated with the names of Dupuit, George, Walras, Pareto, Hotelling, Allais, Samuelson (among others). Along the lines of this tradition, the design of public policies can separate efficiency and equity issues. For example, the most eloquent advocate of this tradition, the second theorem of welfare economics, asserts that an efficient allocation of resources can be obtained via a system of decentralized competitive markets once an appropriate redistribution of income has been achieved. Such a redistribution of income can be achieved however only if the government has access to full information regarding the individuals and firms. In particular, a detailed knowledge of the individual's characteristics that determine both his (her) tastes and the extent and

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profitability of his (her) market activities is required. Observation together with reflection suggest that such a knowledge considerably exceeds the actual knowledge of tax authorities. Indeed the starting point of this book is that the government has only partial information on the agents' characteristics.

The facts retained in the model are primarily the standard stylized facts both of static general equilibrium and of the economics of incomplete information. In an abstract economy à la Arrow–Debreu, the agents' characteristics relevant for taxation decisions are (partly) hidden from the government: technically, they are private information. Our polar world has two complementary features. On the one hand, the organization of the productive activities of the economy is a simple problem in the sense that it could be solved by using the solutions suggested by the second theorem of welfare economics. Then, in the production sector, the model abstracts from the difficulties that parallel the (informational) difficulties emphasized in the household sector. On the other hand, the model adopts a set of rather extreme observability assumptions about transactions.

In a world where the (three) just described ingredients are combined, lump-sum transfers are impossible and the (second) best tax institutions involve the use of commodity and income taxes according to arrangements that are indeed more reminiscent of the actual arrangements of modern economies than of the idealized first-best lump-sum tools. The study of such tax systems, clearly second-best tax systems, is the central subject of this book.

This rather brief assessment of the general perspective of the book suggests that it aims at two different audiences: the audience of theorists and the audience of 'public' economists.

One of the main objectives, and maybe the first one, is to convince theorists, and general equilibrium theorists in particular, that second-best taxation is not only a useful subject for policy makers but also a theoretically sound subject. Both the general construction of the book and the detailed organization of the argument are aimed at this objective.

The general construction follows a strict, and hopefully clear and logical, scheme: the analysis of the basic theoretical status of the model – in chapter 1 – precedes the 'positive' investigation of the subject – chapter 2, the 'normative' analysis – in chapter 3 – provides a basis for the 'political' economics perspective. Indeed, such a basic frame fits the needs of the present study. It is likely to have more general scope and provide useful guidelines to those economic theory studies that have both second-best features and a general equilibrium perspective.

The content also reflects the pure theory option. Chapter 1 contains a

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reflection on the foundations of the tax institutions that are studied in the rest of the book. It is shown that these tax institutions are indeed appropriate in the polar world we are considering. These stylized institutions lead us far away from the polar world of the second welfare theorem but closer to the actual taxation problematic of practitioners. The incentives argument that is developed here will be more familiar to specialists of incentives or contracts than to general equilibrium theorists. However, taxation is a truly general equilibrium subject as chapter 2 shows; the understanding of the structure of tax equilibria requires the full power of the best tools developed for analysing the Walrasian general equilibrium problem. Furthermore, new theoretically attractive problems emerge (as for example the connectedness problem), the solution of which challenges intuition as well as, possibly, actual procedures of practitioners. Chapter 3 adopts a basic perspective in tackling the optimization taxation problem: the tax reform approach provides a local normative analysis that exploits the knowledge of the local structure of tax equilibria; the study of the corresponding tax reform algorithms underline the significance and the limits of optimal tax formulas. The problem of the relationship between social values and prices is lengthily discussed in chapter 4 as a central second-best taxation problem, and, more generally, as a theoretical key second-best problem. Also, the analysis in chapter 5 of the structure of second-best Pareto optima provides insights that have a broad theoretical appeal. Finally the game theoretical analysis of the so-called 'political economics of taxation' within the framework of a very simple model raises points that have specific implications for the analysis of the size of economic organizations, but are also of general theoretical interest.

It is hoped that theorists will find not only a satisfactory framework for analysis, familiar techniques, but also, as just suggested, interesting results. During the 1970s the theory of public economics made substantial advances in our understanding of policy optimization under constraints beyond those of technology and resource availability: the so-called second best. These advances have not been digested by practitioners of public economics or by theorists outside of public economics. Indeed some elements of what can be called the second-best culture have been rediscovered: for example the theory of contracts stresses some normative properties paradoxical to the first-best intuition, but familiar to specialists of optimal taxation. The theory of incomplete markets has reproduced the methodology of local normative analysis of tax equilibria in order to assess the inefficiency of (incomplete) market equilibria. These facts (among others) provide slightly worrying examples of inefficient cross fertilization. This book explicitly aims at favouring the circulation of ideas indispensable to the vitality of the profession.

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The pure theory option of the study is also reflected in the presentation of the argument and the comments: emphasis is put on the coherency and theoretical unity of the whole construction and this option is often detrimental to the recognition of the richness of applications and interpretations. In order to attenuate the effects of such a 'monist' option, a more eclectic view of the content of each of the chapters is offered in the conclusion, that stresses independent interpretations rather than theoretical unity. But until then our comments stick to the initial pure theory option.

Having insisted on the pure theory option (the less obvious when the subject is taxation), I should recall the more obvious: the study is a study in public economics and then, as such, it aims at the audience of public economists. The reasons why public economists should be concerned with the subject of this book are obvious: first the model under consideration is the classical taxation model, the study of which has been pioneered by Diamond and Mirrlees: indeed the second part of chapter 3 gathers a large set of classical results in optimal taxation; also, the same chapter provides a rather comprehensive analysis – within the same framework but with a rather broader ambition – of the tax reform methodology that has often replaced in applied studies the optimal taxation approach. Nowadays, besides optimal taxation and tax reform, alternative methods using computable general equilibrium models have become standard in applied taxation studies. The content of the book also relates with this now most important alternative methodology. Chapter 2 in particular provides a number of insights and results that are of direct relevance to the mastering of computable general equilibrium models.

The pure theory option already emphasized may also be a second reason why public economists should be concerned by the content of the book: it was stressed above that theorists have to learn from the results of second-best theory; one can also safely conjecture that public economists can benefit from confronting their models with the demanding tests of pure theory as they have been set, for example, by general equilibrium theory. My emphasis is not so much here on rigor or generality tests but on what I would be tempted to call 'perspective' tests; by forcing us to assess as exactly as possible the significance and the limits of each result, the pure theory viewpoint helps to put these results in the right perspective. Often, such an assessment of perspective is a prerequisite to prudent and appropriate use. It is also preparation for a better appraisal of the theoretical progresses needed for the development of the field.

It is sometimes argued that public economics is in crisis. It is not the purpose of the present introduction to discuss the extent and reasons of this crisis (if there is such a crisis); one may however conjecture that a better, and hopefully mutually beneficial, dialogue between pure theory and public economics – to which this book attempts to contribute – is most desirable.

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Three more points should be underlined.

The first remark applies to the delimitation of the subject of the book; I have argued above that it was strongly determined by the consistency requirements of the pure theory option; it is also clear that it reflects my own interests: conformably to the rules of the monograph game, the selection of subjects is much influenced by proximity with my own work through personal or co-authored contributions. It will be explained in the conclusion what are, in my view, the main gaps in this book as well as in present theory. Let me only stress here that the two explanatory factors, theoretical consistency and personal interest are not necessarily contradictory.

The second remark concerns the prerequisites of this book's reading. This book has been written as a monograph and not as a textbook; this option is in line with the objectives of the series as well with the initial intellectual contract. Consequently, the book uses mathematical techniques that are not necessarily elementary; also, as stressed by one referee, the discussion often supposes a good deal of intellectual maturity from the reader. A reader's guideline provides however different reading schemes: the first scheme (indicated*) refers to the most elementary – technically or conceptually – parts, providing a broadly accessible introduction to the issues covered in this book. The second scheme (indicated**) retains the central message of the monograph, and can be used as an advanced textbook, which should be accessible to graduate students who have acquired through good education enough conceptual and technical maturity, whatever their field of specialization. The third scheme (indicated***) includes subjects that are closer to research and/or that correspond to ramifications of the central line of argument. A fourth scheme (****) adds subjects that are more distant to our preoccupations and that have been included for the sake of completeness. The letters T or C signal that the corresponding (sub) section has a mainly technical (T) or conceptual (C) character (they are only used for (***) or (****) sections). Finally the indications given in the table of contents provide, when necessary, rough aggregates, for sections, of the different difficulties of subsections.

The last remark concerns the mathematical prerequisites. The book assumes a knowledge of algebra, calculus and topology that is provided by most internationally recognised graduate programs in economics. The Mathematical appendix has two parts: the first one gives definitions and results in differential topology that are outside the scope of standard graduate programs but that are useful in chapter 2. The second one is a selected remainder of results that are either intensively used here or possibly less well known.

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Acknowledgements

The writing of this monograph has been a long venture with which three editors of the series F. Hahn, J.M. Grandmont and A. Dixit have been associated. I am grateful to them for their support. I have a particular debt to F. Hahn and A. Dixit. F. Hahn convinced me to undertake this project, read several early pieces and went on encouraging it all along. I was most sensitive, here as elsewhere, to his intellectual enthusiasm. The pure theory style of the output reflects his initial influence as well as my own inclination. This monograph also owes much to A. Dixit. His warm encouragement and expert suggestions were decisive in triggering the completion of the manuscript. Later, he provided generous and precious advice.

My interest in public economics, which this book exemplifies, certainly reflects an economic education much influenced by the tradition of the French 'ingénieurs économistes'. This tradition goes back at least to J. Dupuit. I was exposed to it directly through the reading of the work of M. Allais, E. Malinvaud and more particularly M. Boiteux and S. Kolm but also indirectly through the intellectual influence of a 'connoisseur' of the tradition, J.H. Drèze.

The pioneering work of P. Diamond and J. Mirrlees, who have applied the second best optimization techniques developed by Samuelson and Boiteux (among others) to taxation problems, is the main starting point of the reflection of this monograph. Indeed the model under consideration here is mainly the so called Diamond–Mirrlees model and Diamond–Mirrlees's early results on optimal taxation are reported, mainly in section 5 of chapter 3.

Although a more complete assessment of the relationship of the content of the book with the literature is postponed to the bibliographical note that appears at the end of each chapter, some direct preliminary acknowledgement of other key intellectual connections should be made at the outset.

First, this book relies much on a number of previous co-authored contributions. I have then a particular debt to my friends and co-authors

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F. Fogelman, G. Fuchs, M. Jerison, C. Oddou, M. Quinzii, K. Roberts and J. Tirole. Working with them was for me both enjoyable and fruitful. They have some responsibility for the content of this book although the usual disclaimer, concerning mistakes, applies.

Second, my understanding of the issues covered here has much benefited from my familiarity with the written work of (but also often from discussion with) A. Atkinson, A. Dixit, J.H. Drèze, J. Stiglitz, S. Kolm for the public economic aspects, P. Dasgupta, J. Green, P. Hammond, L. Hurwicz, J.J. Laffont, E. Maskin for incentives theory, Y. Balasko, G. Debreu, E. Dierker and A. Mas Colell for general equilibrium.

Third, close relationships of the results reported here with the work of P. Hammond (chapter 1) and J. Greenberg–S. Weber (chapter 4) (besides Diamond–Mirrlees in chapter 3) should be stressed.

Thanks are also due to those who read parts or all the manuscript i.e. besides three anonymous referees and the editors, C. Blackorby, P.A. Chiappori, J. Cremer, E. Dierker, P. Hammond, M. Jerison, T. Piketty, J. Tirole. I am also grateful to students of my 1992 course in public economics at EHESS and particularly to S. von Coester and H. Heloui.

Finally, many have contributed to the efficient typing of the manuscript at various stages including C. Eudet, H. Monot, M.T. Pillet but special thanks are due to M.H. Kaufmann and E. Lemeille. I am grateful to A. Rix for editorial and linguistic assistance.

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