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978-0-521-10459-3 - UK Tax Policy and Applied General Equilibrium Analysis

John Piggott and John Whalley

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In the last ten years, general equilibrium modelling has become a significant area of applied economic research. Its focus is to develop techniques to facilitate economy wide quantitative assessment of allocative and distributional impacts on policy changes. *UK Tax Policy and Applied General Equilibrium Analysis* presents the first book length treatment of the development and application of an applied general equilibrium model of the Walrasian type, constructed to analyse UK taxation and subsidy policy.

The material splits naturally into two parts. Part I provides an account of the formal structures of general equilibrium models, with and without taxation and describes the procedures used for empirical implementation. This allows actual policies to be realistically analysed. These procedures depend upon the policies that the model is designed to address and for this reason an early chapter is devoted to a description of UK tax and subsidy policies.

Part II presents and interprets the results of a series of model experiments. These include the distorting effects of taxes on household consumption, industry production and factory use. A variety of further model extensions are also described, motivated by consideration of more specific tax policy issues. These include the interaction of taxes on savings and inflation, and the effects of taxes on the appropriate level at which public goods should be provided.

As a whole, *UK Tax Policy and Applied General Equilibrium Analysis* offers the reader two things. First, it gives a detailed account of the development of an applied general equilibrium model of the UK. Second, it provides results of model experiments which have been designed to inform the policy debate, not only in the UK but also in other countries. It should thus be of interest to both researchers and students undertaking research in the applied general equilibrium area, and to policymakers concerned with tax reform.

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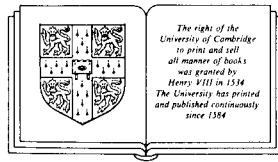
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To our wives, Dorry and Maggie

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PREFACE

This manuscript was originally prepared in camera ready copy in 1981, at which point the original publisher withdrew due to concerns over the small market for such a specialized research monograph. Since this date there have been many developments both within the field of applied general equilibrium analysis, and in UK tax policies.

Recent developments in applied general equilibrium are reflected in two conference volumes [Scarf and Shoven (1983) and Piggott and Whalley (forthcoming)]. A recent survey paper by Shoven and Whalley (1984) provides an up to date summary. On the tax front, developments in the UK have continued with the usual round of budget and other changes.

We decided not to revise our manuscript to reflect all of these developments. Not only does this involve a large volume of work, but we were concerned not to interrupt the flow of the present draft with a series of inserts. Even without any revisions we believe that our book makes a significant contribution to the applied general equilibrium literature by focussing applied modelling heavily towards results, and their ultimate policy applicability. While some of the model structure has been extended in subsequent work (particular in dynamic sequenced models used to analyze taxation and savings issues), there are features of our model which are still not present in other modelling efforts. Among these are the incorporation of public goods as a model variant, and household detail on the demand side.

While the numbers may be a little dated, the approach to tax policy outlined and its ultimate policy applicability seem to be generating increasing interest. Our hope is that, even in its present slightly dated form, this book will help in the process of assimilating these developments.

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ACKNOWLEDGEMENTS

This book has its origins in a model of the UK economy and tax system used in a Ph.D. thesis written by the second author at Yale in the early 1970's (Whalley, 1973). Since then a large number of adaptations and extensions have been made. The original model was of limited dimensionality, with few of the present features, and used data which in places were highly stylized.

During this period of time, help, encouragement, and support have been received from many quarters. The second author would like to acknowledge the excellent thesis supervision he received at Yale from William Brainard and Herbert Scarf, and the help and encouragement of John Shoven. John Shoven's support has been instrumental in this work from the beginning and still continues.

While at LSE (1973-1976) where the present model form developed, a research grant from the Social Science Research Council provided vitally needed support and enabled John Piggott to join the project. At this time, a number of United Kingdom government departments and statistical agencies, too numerous to list here but referred to in the text, dealt with our requests for data and information kindly, courteously, and expeditiously. LSE provided the significant amounts of computer time that model execution required at this stage.

At Western Ontario (1976 to the present), a research grant from the Social Sciences and Humanities Research Council, Ottawa, has enabled work to continue on the model, and for the present volume to be brought to fruition. The University has also generously provided additional computer support.

As our work and drafting has developed, many comments have been received from colleagues, students, and seminar participants too numerous to individually list, but we would nonetheless like to thank them all. We would also like to acknowledge the fine research assistance of France

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St. Hilaire, Jon Fuller, Bob Hamilton and Bernard Yeung. Various drafts have been typed by patient secretaries at the Universities of Western Ontario and Adelaide, and at the Australian National University. Mrs. Jan Anthony expertly prepared the final drafts and camera ready manuscript.

In two previous papers, Piggott and Whalley (1977), Piggott and Whalley (1981), we have discussed the structure of the model we use together with some of the results presented in the present volume. One point for readers to keep in mind is a difference in emphasis on summary statistics used to evaluate income distribution impacts of tax changes between Piggott and Whalley (1981) and the present volume. This is discussed more fully in the text.