UNIVERSITY OF CAMBRIDGE

DEPARTMENT OF
APPLIED ECONOMICS

TWENTYFOURTH REPORT

ACTIVITIES IN THE PERIOD
OCTOBER 1983 to SEPTEMBER 1984
Committee of Management, January 1984

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Company finance and performance
Stagflation: a macroeconomic policy in conflict
full employment and price stability
Debt and the recession
Supervision of growing businesses: roles and responsibilities
Adjustment problems and policy in an integrated world economy
The impact of import restrictions in the inter-war period
Industrial structure and economic performance: Britain and France in the 1930s
Agricultural reform in China
Risk, information and quantity signals in economics
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II. RESEARCH ACTIVITIES

This section outlines the work done in 1983-84 on the research projects being conducted in the Department.

A. ECONOMICS

GROWTH AND FLUCTUATIONS IN THE BRITISH ECONOMY: PROJECTIONS FOR PLANNING

Project members

Swami Amrit Terry
(Chair T.S. Barker)
Senior Research Officer

Dr. V.K. Borooah
Senior Research Officer

Mr. A. Chaplin
Research Student on ESRC linked studentship

Dr. M. Landesmann
Research Officer

Dr. A.W.A. Peterson
Senior Research Officer

Mr. R.G. Pierse
Research Officer

Mr. A. Snell
Junior Research Officer

Professor Sir Richard Stone
Professor of Finance and Accounting
University of Cambridge

Mr. M.R. Weale
Junior Research Officer
Associate members

Mr J.A. Beath:
Department of Economics, University of Bristol

Mr A. Goudie:
Department of Applied Economics, University of Cambridge

Ms Linda Hesselman:
Cambridge Econometrics Ltd

Mr A. Lawson:
Faculty of Economics and Politics, University of Cambridge

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Faculty of Economics and Politics, University of Cambridge

Dr H. Pesaran:
Faculty of Economics and Politics, University of Cambridge

Dr D. Sharpe:
Wolfson College, Cambridge

Dr L.A. Winters:
Department of Economics, University of Bristol

Visitors to the Project:

Philippe Cuneo, Department of Enterprises, INSEE, Paris, France

Professor Dong Ho Rhee, Department of International Economics, Seoul City University, Korea

Pini Graziano, Faculty of Law, University of Modena, Italy

Dr Pavle Petrovic, Faculty of Economics, Belgrade, Yugoslavia

Professor J. Rattsé, Institute of Economics, University of Trondheim, Norway

Funding

The present basis for funding the project is that 75% of the direct costs are financed by the ESRC whilst the remainder comes from Cambridge Econometrics (a company set up to provide a commercial service using the project's model), and from other sources.

The objectives and organisation of the research

The aim of this project, which is under the direction of Swami Amrit Terry (Dr T.S. Barker), is to study quantitatively, in as great detail as practicable, the present structure and future prospects of the British economy and the possibilities of influencing these prospects by means of economic policy. To do this, the project has developed a multisectoral dynamic model of the economy (MDM).

The research activity of the project is organised around this model. Each member of the project is expected to contribute towards the improvement of existing relationships in the model, the introduction of new ones and the examination of the overall performance of the model and its projections. During the period of this report, responsibility for research into various aspects of the model was allocated as follows:

Swami Amrit Terry
(T.S. Barker)
co-ordination of research; exports, imports and their prices; complete model simulations

Vani Borooah
consumers' expenditures

Michael Landesmann
stockbuilding and production

Tony Lawson
wage rates; expectational variables in the model

William Peterson
industrial investment and employment functions; energy submodel; complete model simulations

Richard Pierse
income, spending and portfolio allocation of the personal sector; econometric methods; solving the model over the past

Andrew Snell
the exchange rate

Martin Weale
the financial model; industrial pricing
Progress of the research
The main developments in the model during the year have been the inclusion of the 'real wage resistance' equation to explain money wage rates in the forecasting version and the estimation and testing of an exchange rate equation as an alternative to the assumption of fixed rates. A major effort has gone into completing the re-estimation of the equations and writing up the results in the book on the model and its properties. This book, now in draft form, will appear in the series Cambridge Studies in Applied Econometrics. The main additional areas of research on particular aspects of the economy have been in financial behaviour, consumption and the distribution of income, industrial pricing, the external sector and employment.

Relationship with the Macroeconomic Modelling Bureau
The 1983 version of MDM6, together with the forecast produced by Cambridge Econometrics in June 1983, was supplied to the Macroeconomic Modelling Bureau and Institute for Employment Research at Warwick in July. William Peterson visited the Institute in September 1983 to help in the implementation of the model on the Warwick University Burroughs computer. The incompatibilities between Burroughs and IBM dialects of FORTRAN, together with the large amount of data which must be transferred with the model, means that some problems were encountered in the implementation. We hope to reduce these in future by recoding the model solution program in FORTRAN 77, which is now available on both Warwick and Cambridge machines. Members of the project attended the two meetings organised by the Bureau during the academic year 1983-84, and William Peterson presented a paper entitled 'Policy Analysis using a Large Econometric Model' at the July conference.

Other activities
The project has run a full programme of seminars and workshops during term-time in Cambridge and in addition members of the project have presented papers at seminars and conferences elsewhere.

Publications
The following books and papers reporting the work of the project have been published during the year or have been accepted for future publication.


Barker, T. forthcoming (c). Forecasting the economic recession UK 1979-82: a comparison of model-based ex ante forecasts, Journal of Forecasting


Barker, T., F. van der Ploeg and M. Weale forthcoming. A balanced system of national accounts for the United Kingdom, Review of Income and Wealth


Lawson, T. forthcoming (a). Keynes, prediction and economics, in T. Lawson and H. Pesaran (eds), Keynes’ Economics: Methodological Issues, Croom Helm

Lawson, T. forthcoming (b). The context of prediction (and the paradox of confirmation), British Journal for the Philosophy of Science


van der Ploeg, F. 1984 (a). Generalized least squares methods for balancing large systems and tables of national accounts, Review of Public Data Use, forthcoming


van der Ploeg, F. 1984 (d). Risk and linear-quadratic stabilisation, Economics Letters, vol. 15, pp. 73-78

van der Ploeg, F. 1984 (e). Implications of workers’ savings for economic growth and the class struggle, in R.M. Goodwin, M. Krugman and A. Vercelli (eds), Nonlinear Models of Fluctuating Growth, Springer-Verlag, Berlin

van der Ploeg, F. forthcoming. Optimal control methods for the formulation of economic policy, Systems Science, Poland

Stone, R. 1982. How accurate are the British national accounts? To be published


Weale, M. 1984 (b). Quantity and price effects in a model of world trade based on an accounting matrix, Review of Income and Wealth, March

Weale, M. (with Vince Cable) 1983. The economics of import controls in the UK, World Economy, December

Conference Papers and Seminars

The following papers have been presented at conferences during the year.

Conference on the Analysis and Forecasting of Economic Structural Change, IIASA, Laxenburg, Austria, May 1984

Swami Amrit Terry
(T.S. Barker)
The Cambridge MDM and forecasting structural change for the UK economy


Martin Weale
(with James Meade and David Vines)
Financial policy and the exchange rate: a model for use in the investigation of new Keynesian policies

1st International Conference in Banking and Monetary Economics, Orleans, June 1984

Martin Weale
Modelling the financial economy (also given to London Business School, April 1984)

6th Conference of the Society for Economic Dynamics and Control, Nîmes, France, June 1984

William Peterson
Policy analysis using a large econometric model

Cambridge Growth Project/Cambridge Econometrics Conference on The Economy and Industrial Change, Cambridge, July 1984

Richard Pierse and Irwin Fairclough
Properties of MDM

Martin Weale
The properties of the Financial Model

Andrew Snell
MDM8 with an endogenous exchange rate

Vani Borooah
Projections of consumers' expenditure

William Peterson
Responses to policy changes

Martin Weale
Price formation in MDM

William Peterson and Colin Hughes
Beyond 2000

1st Conference of the ESRC Macroeconomic Modelling Bureau, Warwick, July 1984

William Peterson
Policy analysis using a large econometric model


Swami Amrit Terry
(T.S. Barker) and William Peterson
Forecasting and policy analysis with a large-scale macroeconomic model of the UK economy

Regional Science Conference, Canterbury, September 1984

Richard Stone and Martin Weale
Two populations and their economies

The European Meeting of the Econometric Society, Madrid, September 1984

Martin Weale
The structure of personal sector short-term asset holdings (also given to Cambridge Growth Project, October 1983)

The following seminars have been given:

Terry Barker
UK export and import functions: estimates and tests of restrictions (given to the Cambridge Growth Project, February 1984)

Vani Borooah
The interaction between economic policy and political performance (The Lister Lecture given at the British Association meeting, Norwich, 11th September, 1984)

Michael Landesmann and Richard Pierse
The effects of industrial policies in the UK (given to the Cambridge Growth Project, November 1983)

Michael Landesmann
UK exports and relative industrial performance (given to the Cambridge Growth Project, November 1983)

Theories of production and technical change (8 lectures given to Part II (Paper 5) of the Economics Tripos, University of Cambridge)

William Peterson
MDM6 with wages endogenous (given to the Cambridge Growth Project, November 1983)

Econometric tests for MDM (given to the Cambridge Growth Project, May 1984)

Implementing the Pesaran-Evans consumption function in MDM (given to the Cambridge Growth Project, May 1984)
Andrew Snell

MDM6 with an endogenous exchange rate
(given to the Cambridge Growth Project,
March 1983)

Martin Weale

The Cambridge Growth Project model and
the financial economy (given to
Universities of Bremen and Oldenburg,
October 1983)

The accuracy and error structure of the
UK national accounts (given to the
Cambridge Growth Project, January 1984)

An introduction to international economics
(6 lectures given to Prelim. year of the
Economics Tripos, University of
Cambridge)

Growth Project Papers (GPP)

544 The structure of personal sector short-term asset holdings -
Martin Weale

545 Does the United States have a current account deficit? -
Martin Weale

546 Policy evaluation and design before the rational expectations
revolution - Andrew Snell

547 Multiple solutions and current practices in simulating models
containing forward rational expectations - Andrew Snell

548 Full information maximum likelihood estimation of rational
expectations models: a new approach - Andrew Snell

549 North Sea oil and the UK economy 1974-1981 - Terry Barker
and Irwin Fairclough

550 The experience of monetarism in the United Kingdom 1979-1983
- Terry Barker

551 The Cambridge Multisectoral Dynamic model and alternative
strategies for full employment in the UK - Terry Barker

552 A dynamic input-output forecasting model of Korea -
Professor Dong-Ho Rhee

553 Oligopoly power in British industry - Vani Borooah and Rick
van der Ploeg

554 Policy analysis using a large econometric model - William
Peterson

555 Household income, consumption and savings in the United
Kingdom, 1966-82 - Vani Borooah and Don Sharpe

556 Modelling the UK exchange rate in the context of a large
macroeconometric model: the single equation approach and the
role of the rate of interest and of intervention (May 1983) -
Andrew Snell

557 Endogenising input-output coefficients by means of industrial
submodels - Swami Amrit Terry

558 Aggregate consumption and the distribution of income in the
United Kingdom - Vani Borooah and Don Sharpe

Sam Unit Papers (SUP)

115 1979 input-output tables - William Peterson

116 The ownership of the public sector debt - Martin Weale

117 Agricultural and food submodel: data. Note on the output
variable; Intermediate output - Andrew Chaplin

118 Agricultural and food submodel: data. Note on the
‘harmonized’ Production Account and SOEC/ESA Economic
Account - Andrew Chaplin

119 Agricultural and food submodel: data. Note on
inconsistencies in accounting bases, input-outout tables and
agricultural accounts, 1953/4-1979 - Andrew Chaplin

Growth Program Manuals (GPM)

6b PHX2 commands for MDM - William Peterson

TRADE, AID AND BRITISH INDUSTRIAL STRUCTURES
Project member: Martin Weale
Associate member: Vince Cable, Commonwealth Secretariat
Sponsor: ESCOR

This project investigated the effects on the British economy of
different trade and aid policies. Use of the Cambridge Growth
Project Model allowed the industrial implications of different policies
to be studied. By focussing on the textile and motor vehicle
industries it was possible to distinguish the effects of tariffs,
quotas and voluntary export restraint. The consequence of such policies were shown to be industry-dependent and to arise as much indirectly, through offsetting movements in tax and exchange rates so as to maintain internal and external balance, as directly.

Aid policies were also investigated. The effects of tied aid were shown to be much stronger than untied aid, with direct impact falling on the industries whose output was supplied as aid. Some work was also done on the world economy. A model to investigate the global effects of aid policies was considered. Perhaps the most striking result to emerge from this was that if Europe, North America and Japan all give an equal proportion of GDP as untied aid, the external balance of Japan can actually improve.

Publications

ASSESSING ECONOMIC POLICY IN THE UK

Project Members
I. Begg
K. J. Coutts
T. F. Cripps

Professor W. Godley
G. H. Gudgin
T. S. Ward

Sponsor: ESRC

This report covers the first year of a four-year programme which developed out of earlier research on the Effects of Economic Policy undertaken at the DAE and which is being sponsored by the Macroeconomic Modelling and Forecasting Consortium. The project aims to integrate the treatment of national issues within a coherent framework of analysis of the world economy and Europe as a whole. The general aim is being pursued at a number of levels simultaneously.

(a) Macroeconomic theory
Professor Godley, K. J. Coutts and G. H. Gudgin have been engaged in the task of extending and refining the analysis set out in Macroeconomics published by Godley and Cripps in 1983, particular attention being paid to the relationship their work bears to that of other writers. The relationship between this analysis and the traditional IS-LM approach (and Tobin's adaptation of this) is to be found in 'Introduction to the synthesis of macroeconomic theory based on Tobin's Nobel lecture'. This analysis is extended to incorporate a representation of 'inside' money and private debt in 'Outline for a reconstituted basis for macroeconomic theory'. Preliminary empirical work with results for the US economy is presented in 'Inflation accounting of whole economic systems' and forms the accounting basis for the work currently in train which concerns the macroeconomic theory of inflation. Work is also proceeding on the extension of the theoretical model to a multi-country, multi-currency system.

(b) Applied macro-models
K. J. Coutts has updated the former CEPG model of the UK economy in a newer, more condensed form. T. S. Ward, with I. G. Begg and K. J. Coutts, has updated the model of Europe in the World Economy and presented a preliminary set of projections at the meeting of the Federation Europeenne pour les Recherches Economiques (FERE) in Paris, September 1984. A paper by L. Cuyvers of the University of Antwerp and G. Leithauer and G. Karl of the University of Bremen, reporting policy simulations using the version of the model installed at Bremen last year, was also presented at the same meeting.

(c) Software and information technology
T. F. Cripps and K. J. Coutts have been organising software for preparing data and processing macro-models on an IBM-compatible
personal computer. The model of Europe in the World Economy is now being implemented in the Department on an IBM PC-XT which can be used as a terminal to the university network, permitting file transfer to and from the university's IBM 3081 installation and, potentially, the Warwick Bureau. It is hoped to make the World Economy Model available on diskettes to run on IBM-compatible PC's (appropriately configured) at other research institutions in the UK and overseas. It seems likely that the PC-based technology will provide a convenient medium for exchange of data and models to facilitate joint research in the future. This an issue now under consideration by the ESRC Centre for Economic Computing at Warwick as well as the Macro-economic Modelling Bureau with whom we are in touch to discuss present and future work in this direction.

(d) Policy analysis
During the year T.S. Ward has been a leading member of an international research group organised by the FERE on the evolution of economic and social institutions in Western Europe during the past decade. This research group, with participation from seven countries, has developed and extended the conceptual framework developed by Aglietta, Boyer and others which was already extensively applied to comparative research on the French and US economies by researchers at CEPREMAP in Paris. The results have been written up in a two-volume report, written in French, which the Commissariat au Plan intends to publish in a special issue of their review and which it is hoped to publish in English sometime during 1985. During the coming year we intend to contribute to a second major report, organised by the FERE with support from the European Commission and the French Ministry of Research, concerning international aspects of European economic problems. This study will draw substantially on past DAE research, including the macro-model of Europe in the World Economy, as well as on theoretical and applied work undertaken at CEPREMAP and other European centres.

Publications and Papers
Coutts, K.J. CEPG Model of the UK Economy, 9th edition 1984, DAE mimeo
Coutts, K.J. and Godley, W.A.H. 'Introduction to a synthesis of macroeconomic theory based on Tobin's Nobel lecture, mimeo
Cripps, T.F. and Begg, I.G.'Indicators for monitoring the Regional Impact of Extra-Community Trade', report prepared for the Commission of the European Communities, November 1983
Cripps, T.F. and Ward, T.S. (with Swami Amrit Terry) Industrial Outlook: A Feasibility Study, report to Industrial Analysis Division of OECB, June 1984
Fothergill, S., Gudgin, G. and Mason, N. The Economic Consequences of the Sizewell B Nuclear Power Station, DAE, Dec. 1983
Godley, W.A.H. 'Outline for a reconstituted basis for macroeconomic theory', mimeo
Godley, W.A.H. and Coutts, K.J. 'Some proposals for the simplification and reorganisation of macroeconomic theory', Department of Applied Economics, revised working paper, June 1984

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Gudgin, G. and Fothergill, S. Geographical Variation in the Rate of Formation of New Manufacturing Firms, Regional Studies, Vol. 18, No. 3


Ward, T.S. FERE Model of Europe in the World Economy, 1983, DAE mimeo


Other Activities

T.F. Cripps and T.S. Ward (with Sw. Amrit Terry) carried out a feasibility study on setting up an industrial forecasting system within OECD, at the request of the Industrial Analysis Division.

I. Begg, T.F. Cripps and T.S. Ward participated in two conferences on European economic problems organised by the European Federation for Economic Research, one in Santiago, Spain in January and the other in Paris in September.

T.S. Ward gave a paper on recent and prospective developments in the UK economy to a symposium on The British Economy in 1984 held in Paris in March at the Universite de Paris - Dauphine.

T.S. Ward contributed to two conferences organised by the European Parliament, one on Problems of Economic Policy held in Brussels in October 1983 and one on Problems of the Mediterranean Economies held in Palermo, Sicily in December 1983.

T.S. Ward gave two seminars to the Economics Department of University College, Swansea in October 1983 on the recent work of the Cambridge Economic Policy Group.

T.S. Ward has continued to contribute policy analyses to the Treasury Committee and was appointed as one of the specialist advisers for the Committee's enquiry into long-term public expenditure trends.

K.J. Coutts attended the international conference on 'Economic Policy and National Accounting in Inflationary Conditions' organised by the European Commission and the University of Bergamo, Bergamo, Italy, January 1984; a conference on macroeconomic modelling of the USA economy, New School for Economic and Social Research, New York, April 1984; a meeting on 'Persistent Decline in Profits in OECD Countries', OECD External Relations Division, Paris, July, 1984; and a seminar and conference on UK macroeconomic modelling organised by the ESRC Macroeconomic Modelling Bureau held at London Business School, March 1984 and at Warwick University, July 1984.

G. Gudgin gave evidence to the Public Inquiry into the Sizewell B Nuclear Power Station on behalf of the National Union of Mineworkers in December 1983. Papers on Employment in the Service Sector were given to the Regional Studies Association In Durham and at the University of Kent. Attended the European Conference Emploi et Crise in Paris, June 1984.
LABOUR STUDIES GROUP

Project Members: Jill Rubery, Roger Tarling, Frank Wilkinson

Associate Members: Christine Craig, Elizabeth Garnsey

1. International Working Party on Labour Market Segmentation

The Labour Studies Group continued its active involvement with the International Working Party throughout the year.

Mr György Sávazs from the Karl Marx University, Budapest, spent six weeks working in Cambridge with the Labour Studies Group in January/February 1984. This visit facilitated the organisation of the Sixth conference of the Working Party which was held in Budapest in July 1984. Jill Rubery and Roger Tarling gave a paper on the State and unions in the labour market in the UK.

2. The Impact of the Retail Trade Wages Councils

This project was commissioned by the Department of Employment with the aim of assessing the effects of changes in statutory minimum wage rates on earnings and employment in the Retail Trades.

The report has subsequently been revised for publication in the Department of Employment Research paper series.

3. Employment consequences of changes in the manufacturing production process

Sponsor: ESRC

This project is designed to explore the qualitative effects on employment structure and organisation of changes in product markets, products, technology, industrial structure and the organisation of work in several industries. Interviews have been carried out with a large number of firms, ranging from small to large, to explore the characteristics of each industry and the inter-relationships between the factors involved. The industries studied are agricultural machinery, heating and ventilating equipment, construction and earth moving equipment, domestic appliances, telecommunications, printing machinery, hosiery and furniture. The work being carried out at present is an analysis of similarities and differences in the experiences within and between these industries.

Publications and Papers


E. Garnsey, J. Rubery and F. Wilkinson, 1984. Labour market structure and workforce divisions, Unit 8 of the Open University Course Work and Society, to be reprinted in a book Work and Society based on selected units from the course

J. Rubery (with J. Humphries), 1984. The reconstitution of the supply side of the labour market: the relative autonomy of social reproduction, Cambridge Journal of Economics, vol. 8, no. 4


F. Wilkinson, 1984A. Worker organisation, State Expenditure and Capitalist Crisis, in the inaugural issue of the journal of the Association d'Economie Politique, Etudes d'economie politique, September


Other Activities

Jill Rubery gave a paper to the ESRC/Warwick University conference on 'Is there a management offensive against trade unions' in March 1984, and a paper to the British Sociological Association conference on Work, Employment and Unemployment in April 1984.

Jill Rubery attended a workshop in Sperlonga, Italy in July 1984 to discuss her chapter on trade unions in the recession in the UK for an international comparative book on trade unions.

Roger Tarling and Frank Wilkinson are acting as Specialist Advisors to the Employment Committee of the House of Commons on the subject of Low Pay. A summary paper is being prepared for the Committee.


Frank Wilkinson and Christine Craig gave a seminar at the Department of Employment in November to present the final report on the relation between employment and legal minimum wages in retailing.

Frank Wilkinson gave a Seminar on the flexibility of costs to the Economic Faculty in Modena, Italy in March 1984.

Frank Wilkinson gave a Seminar on minimum pay to the Law Faculty in Cambridge in May 1984.

Roger Tarling and Frank Wilkinson gave a paper to the Manchester workshop on labour markets and unemployment (organised by the ESRC).
Aims of the Project

This 2-year project, which started in November 1982, comprises two separate but related studies. The objective is to study the Northern Ireland labour market, and the role of the public sector in the Province, and the dynamic relationships between the two, in order to compare and contrast the effects of alternative economic development strategies. Work on the labour market includes an analysis of differential changes in birth rates and activity rates as well as net migration flows, and an analysis of the main influences on employment in agriculture, manufacturing industry, and private and public services. An evaluation of the impact of conventional regional policy and the effects of the political troubles on manufacturing employment in the Province has also been undertaken.

The effect of UK fiscal policy on Northern Ireland is being examined by undertaking a detailed analysis of expenditure 'needs' in the Province for each component of public expenditure and comparing these 'needs' with actual public expenditure. A model has also been developed to simulate the effects of changes in different components of public expenditure on the Northern Ireland labour market.

Most of the empirical work is now complete and the work is being written up.

Publications and Papers


Rhodes, J. 1984. Regional dimensions of de-industrialisation, in R.L. Martin and R. Rowthorn (eds), De-industrialisation in the UK Space Economy, Methuen (forthcoming)

As a member of the Regional Studies Association Panel, John Rhodes collaborated in Report of an Inquiry into Regional Problems in the United Kingdom, Geo books, Norwich, 1983.

Three conference papers have been produced during the year. Two of these were presented at the ESRC Conference in Belfast in December 1983 and the third was presented to an ESRC conference in Glasgow in June 1984.
1983. The main computer programs for this extension are now prepared and the final biographical and consistency checks, necessary before the update is completed, are in progress.

(ii) Company Failure and Rescue Policy
This project, which began in January 1984, aims to extend our model of individual companies with the Cambridge Growth Project’s macroeconomic model so as to include a model of company failure; to use the model in policy evaluation and theory testing; and to draw out implications for policies of rescuing failing companies.

Publications and Papers

1. On the Databank Project
Goudie, A. and Meeks, G. 1983A. 'The Cambridge/DTI Company Accounts Databank', paper presented at the ESRC Industrial Economics Study Group Symposium on Data Sources, Queen Mary College, November

2. On the Failure Project
Goudie, A., Meeks, G. and Meeks, J.G. 'A macroeconomic approach to company failure', paper presented to staff seminars at the Universities of Aberdeen, Dundee and St. Andrews

3. On the Model underlying the Failure Project, using material from the databank


4. Papers arising out of the project or incidental to it
Goudie, A. 1984C. The Dividend Decision in the presence of tax exhaustion, Scottish Journal of Political Economy


STAGFLATION: A MACROECONOMIC POLICY TO RECONCILE FULL EMPLOYMENT AND PRICE STABILITY

Project members: Prof. J.E. Meade and Dr D. Vines
Associates: Dr J.M. Maciejowski, Dept. of Engineering, Division of Control and Management Systems
Martin Weale, DAE
P. Westaway, PhD Student with ESRC research-linked award, Economics Faculty
N. Christodoulakis, PhD Student, Division of Control and Management Systems

Sponsor: ESRC

The purpose of this project is to investigate the administrative and economic feasibility of a two-pronged set of policies:-

monetary, budgetary, and foreign-exchange policies designed to ensure a steady but restrained rate of growth of the total money incomes generated by the production of goods and services in the UK; and

a combination of various reforms of different wage-fixing institutions and arrangements which, against the background of a steady rate of growth in the demand for the products of labour, would promote full employment.
1. Work on Wage Fixing

A book on this work entitled *Stagflation Volume 1: Wage Fixing* was published by Allen and Unwin on 21st January 1982. James Meade has continued to lecture and write on this subject and has prepared an extensive manuscript on wage fixing in capitalist, profit-sharing, and labour-managed economies which develops the model of Professor M. Weitzman in the *Economic Journal* for December 1983.

2. Work on Demand Management

In our book *Stagflation Volume 2: Demand Management* (Allen and Unwin, 1983) we designed fiscal policy to keep the money national income on its target path; exchange-rate control through official intervention to keep the balance of payments on current account on a predetermined path; and monetary policy to keep the real rate of interest constant. The implication was that the authorities would be willing and able to finance any budget balance between revenue and expenditure, and any balance between the demand for and supply of foreign currency by the private sector that might result from these policies.

The basic shortcomings of this exercise amounted to a refusal to consider properly the effects of monetary policy. The reason for this was the absence of any information about the effect of relative expected yields (including expected changes in foreign exchange rates) on the international flow of capital funds. We now propose to reconsider our exercises in the light of the best information on this subject that we can obtain. Work is proceeding in five interrelated directions.

(i) Macroeconomic Simulations

Our aim has been to check the viability of our policies on existing quarterly macroeconomic models. This avoids us having to model for ourselves the speed and extent, for example, of tax effects on consumption, or real exchange rate effects on net exports. The full Treasury model appears to be too large to be our basic research tool. We shall not attempt to refine the shortened version of the Treasury model which was constructed specifically for our Demand Management book. The NIESR model appears well suited for our purposes. We shall however need to reconstruct the financial system of the NIESR model, for no presently available financial model would enable us to answer our questions. This became very obvious at a special conference on Financial Modelling held in May 1984. This conference was convened at the New Centre for Economic Policy Research (6 Duke of York Street, London SW1) for the discussion of these issues.

(ii) Financial Modelling

This empirical work is intended to provide parameter estimates for a capital account model which considers the split between aggregated home and aggregated foreign assets. The reasons for attempting to estimate this model rather than relying on other existing exchange rate work are that

- it is easily integrated into the macroeconomic model (see Meade, Vines and Weale, 1984);
- it is a model which identifies the two instruments of financial policy with which we are interested: the short-term rate and foreign exchange intervention;
- it is more general than models which consider only public sector liabilities and private sector money. Blanchard and Dornbusch (Banca Nazionale del Lavoro, Quarterly Review, March 1984) advocate the investigation of a model with this characteristic;
- it recognises the ability of the financial system to transform home assets (this simplifying assumption is the basis of the aggregation of home assets). The work is thus complementary to other work in this area.
One advantage of a simple model of the type we advocate is that it can be estimated as a system, taking into account observed market-clearing prices during the estimation period. Such an approach is not possible with larger supply/demand models which have not always generated very successful market-clearing prices.

Any model of this type requires the estimation of reaction functions for the policy instruments. We intend to estimate an interest rate reaction function, and also a reaction function explaining the mix between home and foreign assets in the financing of the national debt.

Preliminary analysis has enabled the identification of correctly-signed interest rate effects in UK holdings of foreign assets. But foreign holdings of UK assets are less easily explained.

The initial work implies neutral expectations of exchange rate movements. In order to analyse other expectations regimes we should hope to make use of series for expected exchange rate movements estimated by others and also to investigate estimation under rational expectations.

It is quite possible that the interest rate parameters will be poorly determined, although still better than guesses. But a feature of this portfolio balance model is that a shift from internal to external financing of the national debt has clear consequences; the design of our control rules will reflect this.

(iii) Refining our Proposals

There will be three targets of policy: the money national income, the investment ratio, and the overall balance of payments. The instruments of policy will be taxes, monetary policy (the interest rate), and foreign exchange intervention. This differs from our Demand Management book in which the exchange rate was treated as an instrument: here we shall investigate various policies for intervention ranging from a free float up to a completely policy-controlled exchange rate.

We shall

(a) assign the first, second and third instrument to the first, second and third targets respectively;

(b) investigate cross-coupling between targets and instruments, including differing relative strengths of interest rate and intervention adjustments to control the balance of payments;

(c) to look at the robustness of the control in the face of price compensation in wage setting.

Peter Westaway has worked on cross-linking and on robustness to price compensation in wage bargaining. This lays out the ground rules for investigations (b) and (c).

(iv) Extending the Control Design

Our exercises will concern regulation of the economy around a predetermined trajectory. Such a trajectory can be chosen by means of the optimal control techniques used by the Imperial College, London team and others. Regulation about it is best studied using frequency domain techniques, which pay attention to stability margins, rise time, bandwidth, etc. A synthesis of these methods has been developed by Christodoulakis in his Ph.D thesis (funded by the Greek government). This will enable us to study the two problems simultaneously. By contrast, in the Demand Management volume, we ignored the optimal control aspects and instead regulated about an ad hoc trajectory.

Christodoulakis has made further advances in control techniques which will enable us to derive control rules which are insensitive to model uncertainty (including uncertainties of the financial model). Two procedures are available:

formulation of uncertainty as a multi-representation of the economy and design of multi-model controllers;

minimisation of a criterion function which represents a weighted average of uncertainty according to an estimated probability distribution.
(v) Rerunning History

Our aim here is to use the NIESR model, augmented as a result of
Martin Weale's work on capital market modelling, to re-run history
with our policies in place over the 1970s and 1980s. We are aware
of the potential difficulties in this, in particular:
the assumption of hindsight involved in the use of a model
estimated on data which has emerged from a period over
which we now seek to rerun history; and
'Lucas critique' problems (in particular that consumers might
smooth their consumption response to tax changes if our
policies were in place).

From Martin Weale's work we hope to obtain not a precise
description of exchange rate behaviour in the past but a range of estimates - high, medium and low - of the degree of international portfolio substitutability. We shall then use these to investigate
the robustness of reruns of history to:
different interest rate and intervention rules;
different regimes of exchange rate expectation formation
(including rational expectations, but also including
expectations in which the uncertainty about the degree of
international portfolio substitutability corresponds to our own
uncertainty);
different cross-coupling of fiscal and financial policies and
different degree of success in reforming wage-fixing
arrangements;
different trade elasticities and strengths of real balance
effects in consumption. Christodoulakis has found that, for
our purposes, these are the two most important differences
between the NIESR, LBS and HMT models.

Publications and working papers

Christodoulakis, N. 1984. 'Explicit solutions for Optimal Target
Paths under Fixed Macroeconomic Policy Rules', paper
presented at the Society for Economic Dynamics and Control
Conference, Nice, June

Christodoulakis, N., and van der Ploeg, R. 1984. 'Macroeconomic
Policy Formulation with Conflicting Views of the Economy',
paper presented at the Society for Economic Dynamics and
Control Conference, Nice, June

Christodoulakis, N, and Vines, D. 1983. The Dynamic Properties
of the London Business School Model, in T. Basar (ed.),
Modelling and Control of National Economies, Oxford,
Pergamon Press, 1984

Macroeconomic Model using Frequency Domain Methods,
Journal of Economic Dynamics and Control, Jan. 1984

Meade, J.E. 1983A. A New Keynesian Approach to Full
Employment, Lloyds Bank Review, October

Meade, J.E. 1983B. Full Employment, New Technologies and the
Distribution of Income (T.H. Marshall Memorial lecture,
University of Southampton, 1 November 1983), Journal of
Social Policy, Vol. 13, No. 2

Review, June

Meade, J.E., Vines, A, and Weale, M. 1984. 'Financial Policy and
the Exchange Rate: a Model for use in the Investigation of
New Keynesian Policies', paper presented to Centre for
Economic Policy

Vines, D. 1984A. 'A North South Growth Model Along Kaldorian
Lines', Centre for Economic Policy Research Discussion Paper,
August 1984

Vines, D. 1984B. Open Economy Macroeconomic Analysis in
Historical Perspective, Allen and Unwin, forthcoming

Vines, D. and Kanbur, S.M. Ravi. 1984. 'North South
Interaction and Commodity Control', Centre for Economic Policy
Research Discussion Paper, March

Westaway, P. and Maciejowski, J.M. 1983. A Comparison of
Frequency Domain and Optimal Control Methods for the Design
of a Macroeconomic Feedback Regulation Policy, in Basar, (ed.),
op. cit.
Seminars, Conferences etc.
Lectures given by Meade at Southampton (September 1983) and London School of Economics (January 1984); by Vines at Cardiff (October 1983) and Edinburgh and London School of Economics (January 1984); by Meade, Vines and Weale at the Centre for Economic Policy Research (June 1984); by Christodoulakis and Westaway at Queen Mary College and Warwick (December 1983 and January 1984); and by Christodoulakis at Nice (June 1984).

DESTOCKING DURING THE RECESSION
Project member: C. Pratten
Sponsor: Department of Industry

This study examined the role of, and reasons for, destocking in the 1979/82 recession. The novel feature of the study was the obtaining of information from a sample of companies about the causes of their destocking. A report of the study is being published by Gower Press. The report describes changes in stocks and movements of the ratios of stocks to output and stocks to sales during the recession. The importance of destocking as a cause of recession is assessed and the reasons for destocking are described. The effects of stock relief and inflation on stockholding are described and illustrated.

SUPERVISION OF OPERATING BUSINESSES BY HOLDING COMPANIES
Project member: C. Pratten
Sponsor: ESRC

Information about the methods companies use to monitor and control their operating businesses was obtained from 36 UK and American companies. A paper describing the results of the study has been circulated to the companies which took part in the study. This report compared the different methods used by companies.

Other Activities
A textbook entitled Applied Macro-Economics was completed during the year and accepted for publication by Oxford University Press.

A short study was made of the presentation of economics on TV. It was based on a scrutiny of programmes in the Weekend World series.

ADJUSTMENT PROBLEMS AND POLICIES IN AN INTEGRATED WORLD ECONOMY
Project member: M. Panic
Sponsor: A Sainsbury Family Trust

The year 1983/4 was devoted mainly to the writing and revision of the first of the two books emerging from this project. It is now being prepared for publication by Macmillan, under the title National Management of the International Economy.

This book is a combination of economic theory, applied research and economic history used to analyse the conditions which have to be satisfied in order to achieve a sustainable economic order in a highly integrated world economy. The book, as indicated in the Twenty Third Annual Report, consists of five parts: (i) the process of international integration; (ii) the nature and causes of external disequilibria (with a special emphasis on the 'fundamental disequilibrium'); (iii) the effect of external disequilibria on
I am also working on the material for the second book, *Domestic Policy Options in an Open Economy*. This will be also published by Macmillan.

**Other Activities:**

I have given papers and participated in seminars in Oxford, London and Fontainbleau. I have also given talks on British and International economic developments to senior civil servants, bankers and industrialists. I have continued to participate in an CECD Panel of International Experts; and have been made an Associate Member of the Faculty at Ashridge Management College. I also participated, as a member of an advisory group, on a project on inward direct investment into the UK prepared by the *Royal Institute of International Affairs*

**Working Papers and Papers given at Seminars**


M. Panic: 'A Quantitative Analysis of Changes in International Integration since 1950', mimeo.

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**The Impact of Import Restrictions in the Inter-War Period**

**Project members:** Professor Lord Kaldor

Michael Kitson

**Associate member:** John Rhodes

**Sponsor:** ESRC

This two-year project aims to test the hypothesis that the imposition of import restrictions in inter-war Britain increased the demand for the products of British industry and stimulated the expansion of manufacturing output.

The preliminary part of the project has been concerned with the development of three areas of analysis. First, there is comparison of the UK performance with the other main industrial nations. Second, we shall evaluate the components of domestic economic growth. Both these areas are being analysed with the use of published secondary sources. The third area of investigation concerns an inter-industry evaluation: comparing the performance of those industries that were newly protected with those that were not. Data on output employment and productivity have been assembled for approximately 100 industries from the *Census of Production* (1924, 1930, 1935), and trade data aggregated according to the same industrial classification have been acquired from the *Annual Statement of Trade of the UK* (published annually, 1924-1938). Initial results confirm that the strength of the UK recovery in the 1930s was due to the growth of the manufacturing sector. Preliminary analysis of the disaggregated data also indicates that the change in the growth rate of the newly-protected industries was substantially greater than that of the non-protected industries, following the imposition of import restrictions.
Publications


INDUSTRIAL STRUCTURE AND ECONOMIC PERFORMANCE: BRITAIN AND FRANCE IN THE 1970s

Project member: Dr E.H. Lorenz
Sponsor: ESRC Postdoctoral Fellowship Scheme

This three-year project, which commenced in October 1983, investigates recent changes in industrial structure and work organisation in British and French manufacturing. Industrial structure is taken to mean not only the size structure of industry and industry mix, but also the nature of inter-firm relations in a region or district. The project focuses on the impact on structure and economic performance of emerging alternatives to the dominant corporate strategy of the 1950s and 1960s: vertical and horizontal integration combined with the rationalisation of productive units towards mass production of standard products. The following developments have been identified, not necessarily in order of importance:

(i) large firms adopting 'neo-fordist' strategies based on the use of flexible microelectronic technologies and the introduction of more flexible divisions of labour;

(ii) vertical disintegration of large firms associated with increased reliance on outwork and homework;

(iii) the emergence of small scale high technology firms concentrated in particular regions or districts;

(iv) small firms adopting sweat-shop strategies based on 'traditional' technologies, low pay and high work intensity.

These new developments may be interrelated in a particular way. The search for greater flexibility by large firms can lead them to 'put out' work as well as alter their internal division of labour. This in turn can improve the market position of small subcontracting firms who may be encouraged to invest in new technology. Small subcontractors may further diversify their production to lessen their dependence on the orders of particular firms. However, in the absence of trade-union or institutional constraints a low-wage strategy may appear a viable alternative for small firms operating in a competitive environment.

A number of factors help account for these organisational shifts. First, greater market uncertainty during the 1970s has increased the risks of pursuing a mass-production strategy and has encouraged a search for more flexible alternatives. Second, the practical development of computer-based technology, by allowing for greater flexibility without loss of productive efficiency, has acted to reduce the minimum efficient scale of production. Technical developments include computer numerical control (CNC), computer-aided design and manufacture (CAD/CAM) and robots. Third, an increase in trade-union or legal controls at the plant level during the 1960s and 1970s has encouraged large firms to
subcontract work and possibly has enhanced the competitive position of small firms, which can more easily evade such restrictions.

A regional approach was adopted to investigate these relations. In each country an 'old' industrial region in relative decline is being contrasted with a relatively expanding 'new' industrial region. This approach is justified by the fact that variations in the mix of industries between regions cannot explain adequately differences in performance. Moreover, the power of this explanatory variable has progressively decreased over the post World War II period. This suggests that variations in company strategy and inter-firm relations may be important in differential performance. Furthermore, the power of this explanatory variable has progressively decreased over the post World War II period. This suggests that variations in company strategy and inter-firm relations may be important in differential performance. Particular features of local infrastructure may be significant in accounting for these variations in structure and strategy. The use of international comparison, on the other hand, will allow an assessment of the role of nationally specific institutions and conditions.

Published reports and data are being used to provide a general picture of developments in manufacturing industrial structure in the regions under consideration. In addition, interviews with management, trade-union officials and employer-association representatives are being conducted to provide detailed knowledge of conditions in one sector of manufacturing. The interviews are designed to allow both an assessment of the extent to which firms' product-market and labour-market strategies are changing, and an exploration of the underlying causes.

Initially a review of the literature on regional employment growth was made to determine an appropriate choice of regions for comparison in Britain. The East and West Midlands were chosen. These regions show considerable disparity in terms of employment growth, levels of unemployment, average earnings levels and levels of investment by firms in 'new' technology. The East Midlands is progressively outstripping the West Midlands. In the case of France, the department of the Rhone-Alpes was tentatively chosen for international comparison. The Rhone-Alpes is one of France's major manufacturing centres and has experienced considerable interregional shifts in employment away from the traditional industrial agglomerations of Lyon and St. Etienne. Further, the composition of the Rhone-Alpes manufacturing base is similar to that of the Midlands.

The mechanical engineering sector was chosen for a detailed case study. This choice was based on a number of considerations. Mechanical engineering is composed of a number of industries differentiated in terms of performance and industry structure characteristics and sharing a common technology undergoing rapid transformation as a result of the impact of microelectronics. As a producer of capital goods for the manufacturing sector, mechanical engineering has strategic importance for industrial productivity generally.

Census of Employment and Business Monitor statistics were used to construct a basic description of changes in industry structure in the East and West Midlands. This includes: (a) changes in the distribution of employment by SIC and MLII for each region between 1968 and 1981; (b) changes in the size structure of industry by SIC for each region between 1972 and 1981; (c) contrasts between the regional trends and the national trend.

Census data were also used to describe changes in the structure of the mechanical engineering sector nationally. This description includes changes in the distribution of employment by MLH and region between 1971 and 1981; changes in size structure of the industry by establishment between 1968 and 1981; and changes in industry concentration ratios. Overseas Trade Statistics of the UK were used to calculate import and export ratios and UN statistics were used to calculate Britain's share of world markets.
Survey data published by Metalworking Production were used to describe changes in the stock of NC and CNC machine tools according to MLII, plant size and region. These figures confirm qualitative impressions of the trend in the pattern of investment in 'new' technology. They show that small plants (less than 50 employees) account for a disproportionate share of NC/CNC machine tools installed and that their share has increased from 21 to 25 per cent between 1976 and 1982. The relative dynamism of the East Midlands is confirmed, the region having increased its share of the national stock of NC/CNC machine tools from 8 to 13 per cent between 1976 and 1982 while the West Midlands's share fell dramatically from 21 to 9 per cent.

A preliminary survey of industry archive sources in Birmingham, Coventry, Nottingham and Leicester was made. In most cases this did not prove rewarding due to lack of up-to-date material or problems of access. Coventry sources hold out some promise. The Local Records Office has the extant records of Alfred Herberts Ltd., Britain's largest machine tool firm prior to its recent collapse. An investigation of its records should provide insight into the characteristic problems of large engineering firms located in the Coventry district.

Subsequent effort has been devoted primarily to visiting firms in the East and West Midlands. Generally these have consisted of a two to three hour interview with the managing director or production manager. As of to date twenty interviews have been conducted. Ten of these have been with machine tool producers. The machine tool industry holds a strategic position as a supplier of capital goods to the mechanical engineering sector. An investigation of the product market strategies of machine tool producers provides insight into developments in mechanical engineering more generally. Visits have been made to a range of firm types, including large international exporters with dominant market positions in their product range in Britain as well as smaller specialised firms catering to particular market niches. The remaining interviews have covered a variety of industries in mechanical engineering including press and tool makers, hosiery machinery, textile machinery, footwear machinery and general subcontract engineering. The size of firms has ranged from 800 employees to less than 10 employees. Interviews have also been conducted with trade union officials in Leicester and Coventry and have been arranged with employer associations, including the East and West Midlands branches of the Engineering Employers Federation, the Midlands branch of the Engineering Industries Association and the Machine Tool Trades Association.

Publications


Conferences

'The Decline of British Shipbuilding', paper delivered at the Boston University Conference on the Decline of the British Economy, October 1983.

AGRICULTURAL REFORM IN CHINA

Project member: Peter Nolan
Sponsor: ESRC

The purpose of this research is to examine the nature and impact of rural institutional reforms ('de-collectivisation') in China's villages since 1978.

Publications and Papers


RISK, INFORMATION AND QUANTITY SIGNALS IN ECONOMICS

The aim of this project is to investigate at a fairly general and abstract level the consequences of 'missing markets' for economic theory, welfare and macroeconomics. These missing markets are caused by information deficiencies which generate such features as asymmetric information, quantity signals and constraints. In the last year particular attention has been paid to the labour market, where the standard Walrasian account is least convincing and the macroeconomic implications most obvious. Equally important is imperfect information in the market for loanable funds, where investment and hence capital accumulation are directly affected. Individual research work of project members is briefly indicated below together with a list of discussion papers published this year, conferences attended by members and publications.

Hahn Professor Hahn’s two main research areas have been implicit contract theory and macroeconomic theory. In contract theory he has shown that equilibria may be Pareto ranked by employment (everyone is better off with more employment) and that the indifference principle will not always hold (employees would rather work than be laid-off). Over the last year he has co-operated with Professor Solow on a book on employment theory. His paper on wages and employment has shown that real wages may increase with employment levels.

Bray Dr Bray has completed a major piece of work on the stability of rational expectations equilibrium (Discussion Paper No. 79). She also is in the process of completing an introductory piece on information transmission in capital markets. She has also started to work on a dynamic model of a price setting duopoly with customer loyalty.

Newbery Dr Newbery continues to work on problems of energy policy and the tax policy of developing countries. He has been particularly interested in the taxation of transport in Tunisia. He has continued his work on commodity price stabilisation and implicit contracts with J.E. Stiglitz.
Thomas Jonathan Thomas and Tim Worrall have co-operated in the study of a number of problems in contract theory. They have investigated wage contracts which are self-enforcing, that is contracts in which neither the employer nor employee ever has an incentive to renege. That such contracts exist (non-trivially) is perhaps surprising, but more surprising is the fact that the contracts are very simple in form but make current wages dependent upon past history. Arising out of this work is on-going research on long-term loan contracts under asymmetric information. Jonathan Thomas has also made considerable progress in his study of inventory behaviour. Under certain conditions current output is independent of the aggregate stock of inventories.

Worrall Tim Worrall has concentrated on the research indicated above with Jonathan Thomas. In addition he is interested in Oligopoly Theory and long-term models of moral hazard.

Economic Theory Discussion Papers:
The following discussion papers have been produced in the academic year 1983/84.


69. The Manipulation of Futures Markets by a Dominant Producer by D.M.G. Newbery. October 1983

70. Non-Linear Pricing and the Exclusion of Consumers by Ben Lockwood. October 1983

71. Implicit Contracts and Involuntary Unemployment by Frank Hahn. January 1984


74. Self-Enforcing Wage Contracts by Jonathan Thomas and Tim Worrall. April 1984

75. Wages and Employment by Frank Hahn. April 1984

76. Wages and Employment in a Segmented Labour Market by Ian M. MacDonald and Robert M. Solow. January 1984

77. Risk and Trade Policy by David M.G. Newbery and Joseph E. Stiglitz. February 1984


79. Rational Expectations Equilibria, Learning and Model Specification by Margaret Bray and Gene Savin. June 1984

Quaker Workshops
The 'Quaker' Workshops have been particularly successful this year and their format continues to be widely imitated. The following principal talks have been given:

1. Luca Anderlini
   Interdependence in General Equilibrium Models

2. Margaret Bray
   Convergence to Rational Expectations Equilibrium in Misspecified Models

3. Andrew Capling, Harvard University
   Inventory Policies and Macroeconomic Fluctuations

4. Panikos Demetriades
   The Long Run Costs of Inflation

5. Drew Fudenburg (Berkeley, U.C.)
   The Folk Theorem in Repeated Games with Discounting

6. Frank Hahn
   Wages and Employment in a Keynesian Model

7. Tim Kehoe
   The Use of Index Theory in General Equilibrium

8. Tim Kehoe
   Equilibria in Overlapping Generations Models

9. Tim Kehoe
   A Numerical Investigation of the Multiplicity of Equilibria
In addition to the regular Quaker meetings, the Project held a two-day conference at Churchill College for Project members and invited guests. The following papers were presented.

1. David Levine (UCLA) Is the US Economy an Arrow-Debreu Economy?
2. John Moore (LSE) Involuntary Lay-offs and Unemployment
4. Bob Solow Unemployment in Spacial Models of Imperfect Competition
5. Jonathan Thomas Self-Enforcing Wage Contracts

David Newbery has attended conferences in Tennessee and Bangkok to present papers on 'The Effect of Protection on Manufactured Exports for Developing Countries' and 'Equity, Efficiency and the Pricing of Petroleum Products in Asia'. The former with Gordon Hughes is published as CEPR Discussion Paper.

Margaret Bray, Jonathan Thomas and Tim Worrall attended the European meetings of the Econometric Society to present the discussion papers numbers 79, 73 and 74 respectively.

**Publications**


Hahn, F.H. Equilibrium and Macroeconomics, Basil Blackwell

Hahn, F.H. Wages and Employment, in a volume for Sir John Hicks' 80th Birthday, forthcoming


Newbery, D.M.G. and Hughes, G.A. The Effect of Protection on Manufactured Exports for Developing Countries, in L. Klein and Z.A. Elbersdorfer (eds.), forthcoming


The objective of this research, which forms part of a larger project, is to formulate guidelines for imposing taxes on transport fuels - primarily petroleum products - in developing countries taking account of the impact of such taxes on the distribution of income across households and on non-transport use of fuels as intermediate inputs.

The studies of the impact of fuel taxes on prices and the household distribution of income were completed during 1983-84 with a study of Indonesia complementing previous work on Thailand and Tunisia. In most respects the conclusions of these three studies concerning the impact of fuel taxes were similar, except that the Indonesian study highlighted the adverse distributional effects of taxing kerosene when the price of this fuel has previously been subsidised, thus encouraging its use in rural areas. Further work to update these studies using more recent input-output and household budget data has been delayed by difficulties in obtaining the appropriate data but this is expected to be completed during 1984-85.

Hughes has also been engaged in compiling cross-country data on the consumption and prices of petroleum products and on vehicle stocks, new registrations and car prices. This is now complete and is being used to investigate the response of gasoline demand and car sales to changes in the real price of gasoline. The data have also been used to examine how domestic prices and taxes in different countries were altered following the increases in world oil prices during the period 1970-82.

During the year Newbery has been concerned with the modelling and estimation of the social cost of road damage caused by vehicles, which is a crucial element in assessing road user charges. His results, based on both simulation studies and estimates for Tunisia, suggest that for a wide range of plausible parameter values, the marginal and average costs of road damage are very similar. This is a very important conclusion because it implies that efficient road user charges - designed to reflect the marginal social cost of road damage - should generate enough revenue to cover the full cost of maintaining a road network. However, the best method of collecting these road user charges remains to be settled, since there is a rather poor correlation between fuel use and the appropriate road user charge over different types of vehicles.

Bibliography

A. Dixit and D. Newbery - 'Setting the Price of Oil in a Distorted Economy', Economic Journal (forthcoming)

G.A. Hughes (1984a) - 'The Impact of Fuel Taxes in Indonesia'

G.A. Hughes (1984b) - 'The Distributional Impact of Fuel Taxes in Developing Countries'


D. Newbery (1984a) - 'Equity, Efficiency and the Pricing of Petroleum Products in Asia'

D. Newbery (1984b) - 'Estimating Road User Charges'

Seminars, Conferences, etc.

Papers based on the work of the project were given at the AUTE Conference, an ESCAP Workshop on Energy Pricing Policy in Bangkok, the World Bank, the Universities of Warwick and Lancaster, and at a Workshop on Energy Policy in LDC's at the Surrey Energy Economics Centre.
COMPUTER SOFTWARE FOR ESTIMATING QUALITATIVE RESPONSE MODELS

Project members: Dr G.A. Hughes and Dr N.E. Savin
Associate member: A. Guilfoyle
Sponsors: Nuffield Foundation and U.S. Forest Service

This project was established with the objective of developing computer programs capable of performing maximum likelihood estimation for models with qualitative or limited dependent variables using large datasets.

During the 1970s numerical analysts developed a number of algorithms for performing the numerical optimisation of large or complex functions. These have, until now, not been adopted in widely-used econometric packages, so that the first stage of the project work was devoted to a comparison of the efficiency of these new algorithms with the older ones on econometric problems of the type encountered in analysing large cross-section surveys. At the same time we investigated alternative methods of approximating the Hessian of the valuation function which is required to provide the variance-covariance matrix of the estimated coefficients. Our results showed that for almost all problems with large datasets or complex likelihood functions the quasi-Newton method using first derivatives combined with the BFGS update was superior to all other methods, even in cases where a full Newton-Raphson procedure is conventionally used.

The algorithms developed in the first stage of the project have been incorporated in a computer package titled MLPACK. This is designed to enable econometricians and others to estimate a wide variety of models using either maximum likelihood or non-linear least squares estimation. As well as conventional facilities for handling data the package currently incorporates the following commands:

(i) PROBIT - to estimate the probit model for a binary dependent variable
(ii) LOGIT - to estimate the multinomial logit model for a binary or multinomial dependent variable using the conditional, classical or mixed specifications
(iii) MAXLIK - to perform maximum likelihood estimation for a likelihood function supplied by the user
(iv) FIML - to estimate a non-linear system of simultaneous equations using full information maximum likelihood, where the system of equations is specified by a subroutine supplied by the user
(v) NLLS - to estimate a non-linear system of equations using various non-linear least squares procedures including NL0LS, NL2LS, NL3LS and NLSUR

The algorithms have also been incorporated in a new version of the package SHAZAM.

The preliminary version of MLPACK is being tested at the World Bank, the U.S. Forest Service and the University of British Columbia as well as at Cambridge. A revised version of the package will be made available to other universities early in 1985.

In Cambridge the package has been used for the estimation of systems of demand equations using 10,000 observations, for the investigation of the effects of insecticides and for the analysis of joint decisions concerning housing movement and labour mobility.

Papers
G.A. Hughes, J. Robertson and N.E. Savin - 'A Multinomial Logit Analysis of Pesticide Effects on Western Spruce Budworm'.

Seminar
A paper based on the work of the project was given to the Cambridge Statistics Group.
INSTITUTIONAL INVESTMENT, MERGERS AND PUBLIC POLICY
CONGLOMERATE ORGANISATION AND ECONOMIC EFFICIENCY

Teaching Officers directing the project: A. Hughes, A. Singh
Project member on DAE Research Staff: M.S. Kumar
Associate member: A.D. Cosh
Sponsor: Office of Fair Trading

These two projects started in May 1982 and will be completed in March 1985. They extend the authors' earlier work on the impact of mergers, and investigate a range of new issues. The aims and methods of research for the two projects, and the progress made in each, are examined in turn.

1. Institutional investment and mergers

Although there is broad agreement over the facts as well as the reasons for the increasing domination of industrial companies by institutional holdings, the implications of these facts arouse great controversy. The implications are, indeed, far reaching and extend to several areas: from the general social theory of the nature of contemporary capitalist society, to narrow, but extremely important, issues in the economic theory of the firm, and to questions of public policy. In relation to the economic issues, a major reason for these controversies has been the lack of systematic empirical research, particularly at the microeconomic level.

The purpose of the research being undertaken is to shed some light on the influence of institutional investors on company performance and behaviour, and in particular their role in the merger process. The huge merger wave which has engulfed UK industry during the last two decades has been the subject of a large academic literature; the effects of these mergers on industrial performance and economic growth rightly continue to be matters of serious public policy concern. In summary, the results of the academic research so far suggest that at the microeconomic level, the effect of mergers on company profitability has most likely been neutral, i.e. on average mergers have neither raised, nor lowered, profits of amalgamating firms. There is unambiguous evidence that in perhaps half the cases mergers reduced microeconomic efficiency. A central question which arises with respect to the role of institutional investors is whether or not the post-merger performance of companies where such investment is important has been markedly different from that of other companies. To what extent, if at all, do institutional investors use their influence and professional knowledge to discourage mergers which they believe are unlikely to be successful.

The central questions on which the research project - which is certainly among the first of its kind - focuses are the following:

(i) What is the nature and extent of the degree of institutional control of non-financial companies in the UK economy and how has it changed over time?
(ii) Through what channels and in what ways could institutional control affect corporate behaviour?
(iii) Is there any difference in the economic performance of companies in which institutions have greater 'control' or involvement compared with those where they have less or no control?
(iv) Do institutions play a distinct role in the corporate merger process compared with other kinds of holders of shares?
(v) Are the pre-merger characteristics of either the taken-over or the acquiring companies in which institutional shareholdings are 'important' different from similar companies where such shareholdings are not so important? Is the post-merger performance of acquiring companies with sizeable institutional holdings different from that of other amalgamating companies?
The issues are being studied in two complementary ways. First, by means of ex post statistical data and observed outcomes, and second, by means of interviews. With regard to the first, very detailed research has been done, based on data on company characteristics and performance, and on data on company stockholdings, which were collected from share registers and other sources. An analysis has been undertaken into the extent of institutions' involvement in over 300 large companies, and its effect on companies' performance, in particular on the post-merger performance. A comprehensive report based on this work has been submitted to the OFT.

With regard to the second approach detailed interviews are being conducted with representatives of a selected sample of Pension Funds, Insurance Companies, Shareholder Protection Committees and other relevant institutions, with valuable assistance from the Industries division of the Bank of England. It is hoped that when the project is completed the OFT will give permission for the publication of the results of the research in the form of a monograph.

2. Conglomerate organisation and economic efficiency

This research has two main aims: first, to answer some basic questions about the internal organisation and economic performance of large diversified firms in the UK; second, to consider the implications of these results for the development and implementation of industrial and competition policy. Particular attention is paid to questions of investment appraisal and the allocation of capital funds within companies, and a distinction is drawn between investment in new capital equipment and the purchases of subsidiaries. As for the institutional investment project, the research is being carried out using questionnaires and interviews with management, as well as using published information on ownership, diversification, and other characteristics of firms, and their performance. A large body of data collected on the diversification and ownership of companies is being combined with the DI Databank to examine the relevant issues, and the statistical analysis has been completed.

Papers and Publications


SOCIOLOGY

REPRODUCTION OF SOCIAL INEQUALITY

Project Members: Dr R.M. Blackburn
Dr K. Prandy
Mr A. Stewart

Associate: Dr L. Miller-Bernal, Wells College, New York

Sponsor: ESRC

This project, which commenced in May 1978, was designed to continue and extend the work of the group, and earlier projects (described in previous Annual Reports) were incorporated.

The project is concerned with the general area of social inequality and social change, addressing a number of problems of theoretical and practical importance. A basic feature is the attempt to move towards a more dynamic model of social stratification which takes account of processes of reproduction of societies.

The research involves a number of themes relating to social stratification, including white-collar unionism, the labour market, careers, and perceptions, understandings and evaluations of social inequality. Current work is focussed on the last of these themes.

Publications and Papers

Stewart, A., 'Gender, Households and Employment', ESRC Symposium on Labour Markets, Manchester


Stewart, A., 'Theory and Measurement; New Approaches to Social Data', DAE Sociology Seminar, November

THE IMPORTANCE OF SOCIAL STRATIFICATION

Project members: Dr K. Prandy
Dr R.M. Blackburn

Sponsor: ESRC

The project examines the argument that there is greater coherence in stratification arrangements than has previously been shown to exist. It will re-analyse existing data sets to test our contention that relationships are stronger than previously found and evaluate the results, rather than seek to uncover new relationships. The main areas to be considered are inter-generational transmission of advantage, marriage, friendship, income, education, home and car ownership and, to a lesser extent, attitudes and beliefs. An essential step has been the production of a more adequate measure of stratification which will be made available for general use. This is continuous, but one aim of the project is to explore its relationship to possible groupings into discrete classes. The project is intended both to benefit those concerned with empirical research, and also to have significant theoretical implications.

The bulk of the work on construction of a revised scale has now been carried out. The scale cannot yet be regarded as finalised, because a certain amount of modification is likely as a result of experience in its use. This is especially true where there are small numbers involved in a group and hence a greater possibility that those in our sample may not be representative.

Certain other issues also require further examination in the light of the proposed analyses. Towards its upper end that scale shows a marked increase in the average interval between points, and while this is almost certainly in part a consequence of the methods used in its construction it may also reflect a social reality. Also there are indications that certain situational effects may be operating, so that for example skilled workers in construction are coming out with lower scale values than might have been expected.
One area where scale development and analysis necessarily go together is that of gender and occupation. Our major datasets are comprised solely of males, and the scale could thus be described as one of male occupations. We have begun to examine the validity of this description by looking at marriage patterns, using our own data and, of others so far, the 1979 British General Election Survey. A paper based on this work was presented at the ESRC Symposium on Gender and Stratification. Precisely how gender should be incorporated into the scale, or even whether this is absolutely necessary, is not yet decided. Further analysis and theoretical clarification are required. However, we have found our analyses do demonstrate greater consistency in stratification arrangements, in the case of marriage, than have previous approaches.

Papers
'Ideologies of Work' (paper given by Dr Blackburn to the BSA Conference University of Bradford, April 1984)
'Similarities of Life-Style and Occupations of Women' (paper given by Dr Prandy to ESRC Symposium on Gender and Stratification, University of East Anglia, July 1984)
'Measurement and Its Relation to Theory' (lecture given by Dr Prandy at BSA Summer School, University of Exeter, September 1984)

OTHER ACTIVITIES OF THE SOCIOLOGY GROUP

The group has maintained its association with colleagues in other institutions. In particular Mr J. Holmwood of the University of Edinburgh and Dr L. Miller-Bernal of Wells College have collaborated in our work. Mr Angelo Pichierri and Dr Tibor Erhart were visitors to the Department.

As in previous years the group was host to the ESRC Social Stratification Seminar.

Dr R.M. Blackburn acted as external examiner for the Hatfield Polytechnic and continued to act as the local sociology representative for the ESRC Survey Archive.

The monograph series Cambridge Studies in Sociology is edited by the group.

The group continued to organise its own seminar series.

This series includes articles by authors representing the Department in journals, conference proceedings and elsewhere. It is distributed free of charge to interested schools and academic institutions. The following titles were added in the series during the year:

No. 76 After Classrooms and Labs
No. 77 Government Policy: A Study of Formulation of Targets
No. 78 A Review of Models and Data in the Norwegian system of Economic Planning
No. 79 Propelling Economic Structure with a Large-Scale "Tension Motor"
II. PUBLICATIONS

DAE OCCASIONAL PAPERS

This series, published for the Department by the Cambridge University Press, is designed for the rapid publication of research results.

One new title appeared in the Series this year. No. 55, Political Aspects of the Economy, by V.K. Borooah and F. van der Ploeg, was published in December 1983. A second title, No. 56, Growth, Acquisition and Investment, by Mannohand S. Kumar, was prepared for press.

CAMBRIDGE STUDIES IN SOCIOLOGY

This series includes works of theoretical and social interest based on the findings of empirical sociological investigations. The books may originate anywhere, but those arising from the sociological work of the Department will normally be included.

The editors are Dr R.M. Blackburn and Dr K. Prandy and the series is now published by Macmillan.

During the year the following title was published:

OTHER DAE PUBLICATIONS

FRE Model of Europe in the World Economy by T.S. Ward (1983)
The Economic Consequences of the Sizewell 'B' Nuclear Power Station by S. Fothergill, G. Gudgin and N. Mason (December 1983)

DAE ECONOMICS REPRINTS

This series contains articles published by members and associates of the Department in journals, conference proceedings and elsewhere. It is distributed free of charge to interested libraries and academic institutions. The following titles were added in the series during the year.

No. 74 Do Mergers Reduce Corporate Investment: Evidence from the United Kingdom Experience Mannohand S. Kumar
No. 75 International Direct Investment in Conditions of Structural Disequilibrium: UK experience since the 1960s M. Panic
No. 76 After Chayanov and Lenin David Lehmann
No. 77 Government Policy, Real Wage Resistance and the Revolution of Conflict Rick van der Ploeg
No. 78 Long-Term Recovery: A return to Full Employment? Terry Barker
No. 79 A Review of Models and Data in the Norwegian System of Economic Planning Terry Barker
No. 80 Projecting Economic Structure with a Large-Scale Econometric Model Terry Barker
No. 81  De-Collectivisation of Agriculture in China, 1979-82: a Long-Term Perspective  
Peter Nolan

No. 82  A New Keynesian Approach to Full Employment  
James Meade

No. 83  Industrialisation in Africa: A Structuralist View  
Ajit Singh

No. 84  Foreign Aid for Structural Change: Lesotho  
Ajit Singh

No. 85  Hypotheses about Mergers  
Alan Hughes, Dennis C. Mueller and Ajit Singh

No. 86  Competition Policy in the 1980s: The Implications of the International Merger Wave  
Alan Hughes, Dennis C. Mueller and Ajit Singh

No. 87  The Causes and Effects of Takeovers in the United Kingdom: an Empirical Investigation for the Late 1960's at the Microeconomic Level  
Andrew Cosh, Alan Hughes and Ajit Singh

DAE SOCIOLoGY REPRINTS

The following title was added to the series during the year.

No. 10  The Role of Contradictions In Modern Theories of Social Stratification  
J. Holmwood and A. Stewart

III OTHER ACTIVITIES

DAE LIBRARY

During the period October 1983 to September 1984 the Department received 153 periodicals: 16 of these were in exchange for the Department's Reprint Series and 51 were gifts, the remainder being purchased. The library has acquired 134 books, 987 pamphlets and 305 government publications.

COMPUTING UNIT

During the period from October 1983 to September 1984 the Computing Unit have successfully transferred the Department's programs and files to the MVS-based operating system which was introduced in June 1984. Advantage has been taken of the opportunity to rewrite and extend some of the programs concerned.

Diana Day, Mavis Barnett and Shirley Seal have continued to provide computing assistance to the Department projects, in particular by providing graphs using the flat-bed plotter and associated programs; Bobbie Coe has acted as the main source of advice and help to Department staff generally.
TEACHING FOR THE UNIVERSITY

During the year members of the Research Staff gave lectures for Tripos examination courses in the following fields:

- Series production and technical change
- International economics
- Applied macro-economics
- Industrial relations and the economics of the labour market
- Current economic problems
- Women in the labour market
- Competition, growth and structural change
- Growth in the world economy
- Industrial management
- Statistics
- Theory of statistics

They also gave courses for the M.Phil. in Economics, and supervised and examined post-graduate students for the degree of PhD in this and other Universities.

TEACHING FOR THE COLLEGES

Nearly all members of the Research staff also undertook undergraduate teaching for the Colleges. It was estimated by the Working Party on the Economics Tripos that Department members carried out 35 per cent of all such teaching. Ten members were Directors of Studies in Economics and two in Social and Political Sciences.

SERVICE ON UNIVERSITY COMMITTEES

Members of the Department's research staff served on the following University Committees during the year:

- The Committee of Management of the Department, and its Appointments Sub-Committee
- The Faculty Board of Economics and Politics, and its sub-committees dealing with Appointments; Lecture List and Future Needs; Admissions
- The Social and Political Sciences Management Committee

IV - FINANCE

During the financial year (1 August 1983 to 31 July 1984) the Department's annual expenditure was £677,076 compared with £637,728 in 1982/83. 89.9% of the expenditure was on stipends, salaries and wages.

The University Grant rose from £225,135 in 1982/3 to £237,889 in 1983/84, an increase of £12,754. Expenditure went up by £39,348.

The following are the principal new or additional payments by outside bodies which have been accepted during the year for payment over various periods:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic and Social Research Council</td>
<td>£435,067</td>
</tr>
<tr>
<td>Leverhulme Trust</td>
<td>£57,056</td>
</tr>
<tr>
<td>Total</td>
<td>£492,117</td>
</tr>
</tbody>
</table>
RESEARCH STAFF

DIRECTOR
Professor W.A.H. Godley, MA (Cantab)
MA (Oxon), Fellow of King's College

ASSISTANT
B.M. Deakin, MA (Cantab), MA (Oxon),
Fellow of Magdalene College

SENIOR RESEARCH OFFICERS

Swami Amrit Terry (T.S. Barker), MA (Edinburgh), MA PhD
(Cantab), Downing College

B.M. Blackburn, MA (Cantab), PhD (Liverpool), Fellow of
Clare College, Head of Sociological Research

V.K. Borooah, MA (Bombay), MA (Southampton), MA
(Cantab), PhD (Southampton), Fellow of Queens' College

R.J. Coutts, MA (Cantab), Fellow of Selwyn College

T.F. Cripps, BA (Cantab), Fellow of Darwin College

G.H. Cucchi, BA (London), BA (Open University), MA
(Cantab), PhD (Leicester), Fellow of Selwyn College

B.C. Moore, MA (Cantab), MSc (Econ) (London), Fellow of
Downing College

M. Panic, MA (Cantab), MA (Econ) (Sheffield), PhD (Cantab)
(under Special Regulations)

A.W.A. Peterson, MA (Cantab), MA (Essex), PhD (Cantab),
Fellow of Christ's College

K. Prandy, BA (Open University), BSc (Econ) (London), MA
(Cantab), PhD (Liverpool), Fellow of Fitzwilliam College

C.F. Pratten, BA (Bristol), MA (Cantab), Fellow of Trinity Hall

J. Rhodes, BA (Liverpool), MA (Cantab), Fellow of Wolfson
College

A. Stewart, MA (Cantab), BSc (Econ) (London), Emmanuel
College

R.J. Tarling, MA (Cantab), Fellow of St. Catharine's College

D.A. Vines, BA (Melbourne), MA (Cantab), Fellow of
Pembroke College

T.S. Ward, BA (Wales) MA (Cantab), MA (Econ)
(Manchester), Fellow of Fitzwilliam College

S.F. Wilkinson, MA (Cantab), Fellow of Girton College

RESEARCH OFFICERS

I.G. Begg, BA (Strathclyde), MA (Cantab), Darwin College

A.W. Goudie, MA (Cantab), Fellow of Robinson College

M.S. Kumar, PhD (Cantab), Fellow of Sidney Sussex College

M.A. Landesmann, MA (Vienna), Fellow of Girton College

R.G. Pierse, BA (Oxon)

J.C. Robery, MA (Cantab), Fellow of New Hall

JUNIOR RESEARCH OFFICERS

D.J.H. Canning, BA (Belfast), PhD (Cantab), Darwin College

M. Kitson, BA (Cantab)

A.J. Snell, BSc (Econ) (Hull)

J.F. Thomas, BA (Cantab), DPhil (Oxon), St. John's College

M.R. Wente, MA (Cantab), Fellow of Clare College

T.S. Worrall, BA (Econ), (Liverpool), MA (Econ) Essex, PhD
(Econ) (Liverpool)

PUBLICATIONS SECRETARY

Mrs A. Newton, MA (Cantab)

RESEARCH ASSOCIATES

Dr A.D. Cosh, Department of Engineering, Fellow of Queens'
College

Professor F.H. Hahn, Faculty of Economics and Politics,
Fellow of Churchill College

Dr E. Garnsey
Mr A. Hughes, Faculty of Economics and Politics, Fellow of Sidney Sussex College
Dr G. Hughes, Faculty of Economics and Politics, Fellow of Churchill College
Professor the Lord Kaldor, Fellow of King's College
Professor T.J. Kehoe, Massachusetts Institute of Technology
Mr T. Lawson, Faculty of Economics and Politics
Professor J. Meade, Fellow of Christ's College
Dr B. McCormick, University of Southampton
Dr G. Meeks, Faculty of Economics and Politics, Queens' College
Dr J.G. Meeks
Dr D. Newbery, Faculty of Economics and Politics, Fellow of Churchill College
Dr P. Nolan, Faculty of Economics and Politics, Fellow of Jesus College
Dr H. Pesaran, Faculty of Economics and Politics, Fellow of Trinity College
Mr P. Pettit, CEPREMAP, Paris
Dr N.E. Savin, Faculty of Economics and Politics, Fellow of Trinity College
Dr A. Singh, Faculty of Economics and Politics, Fellow of Queens' College

VISITING SCHOLARS, OCTOBER 1983 - SEPTEMBER 1984

Dr G. Bjerkholt, Central Bureau of Statistics, Oslo, Norway
Mrs V.K. Borooah, University of Southampton
Mr P. Cuneo, INSEE, France
Mrs E. Desai, Institute of Applied Manpower Studies, Dehli, India
Mr E. D'Oliveira, Coimbra University, Portugal
Dr T. Erhart, National Planning Office, Budapest, Hungary
Mr P. Jaszi, American University, Washington, DC, USA

Mr T. Mackay, City of London Polytechnic
Dr L. Miller-Bernal, Wells College, Aurora, New York, USA
Mr E. Offerdal, Central Bureau of Statistics, Oslo, Norway
Professor L. Osberg, Dalhousie University, Halifax, Nova Scotia, Canada
A. Pichieri, Torino University, Italy
Professor B.P. Philpott, Victoria University of Wellington, New Zealand
Mr G. Rampa, University of Pavia, Italy
Professor J. Ratté, Trondheim University, Norway
Mr G. Serafetinidis, Panteios School of Political Science, Athens, Greece
Mr S. Stroem, University of Oslo, Norway
Mr G. Sziraczki, Karl Marx University, Budapest, Hungary

ASSISTANT STAFF, OCTOBER 1983 - SEPTEMBER 1984

Mrs I. Bailey
Mrs M.J. Barnett
Mr E.D. Bougourd
Ms M.V. Clark
Mrs R. Coe
Miss D.M. Day
Mrs S.L. Douglas
Ms T.C. Gurner
Miss C.A. Hudson
Mrs M. Martin
Miss A. Mason
Miss S. Metcalf
Mrs S. Moore
Mrs O.E. Peppercorn
Miss S.D. Seal
Mrs E.L. Scott
Ms S. Sibson-Turnbull
Mr R. Smith
Mrs B.P. Watson
Mrs K.M. Wilson