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UNIVERSITY OF CAMBRIDGE

DEPARTMENT OF APPLIED ECONOMICS

NINTH REPORT
ACTIVITIES IN THE PERIOD
OCTOBER 1968 TO SEPTEMBER 1969



March 1970



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Director
W.B.REDDAWAY

Committee of Management, September 1969

A.SILBERSTON (Chairman)

R.M.BLACKBURN	Professor N.KALDOR
D.G.CHAMPERNOWNE	H.H.LIESNER
Miss P.M.DEANE	Professor W.B.REDDAWAY
C.H.FEINSTEIN	Professor RICHARD STONE
	Professor H.A.TURNER

Secretary
H.LOSHAK

J.H.GOLDTHORPE and Professor J.R.S.REVELL were also members of the Committee of Management during part of the period covered in this Report.

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NINTH REPORT OF THE DEPARTMENT OF APPLIED ECONOMICS

(covering the year October 1968 to September 1969)

I. RESEARCH ACTIVITIES

1. This section outlines the work done in 1968-69 on the twenty-two research projects being conducted, and lists the seven new ones which started in the current academical year.

(a) Economics and Economic History

Growth and Fluctuations in the British Economy: Projections for Planning

2. Work on this project, under the direction of Professor Stone, has continued along lines described in previous Reports. A further volume, no. 9, entitled *Exploring 1972: with special reference to the balance of payments*, will shortly be added to the series *A Programme for Growth* (London: Chapman and Hall) in which the main results of this research are published.

3. The research staff working with Professor Stone during the period covered by this Report was as follows: Mr A.G. Armstrong, Mr T.S. Barker, Mr M.J. Green, Mr O.T. Hooker (on leave of absence with the Department of Trade and Industry in the Province of Nova Scotia, Canada), Mr J.R.C. Lecomber, Mr C.S. Leicester, Dr L.J. Slater, and Mr K.J. Wigley. Mr J.R.C. Lecomber and Mr M.J. Green left the project in September 1969. Messrs A.G. Armstrong and K.J. Wigley will leave it at the end of December. Messrs M.A. King and D. Livesey joined the project in October and Mr V.H. Woodward will join it in February 1970. Wing-Commander R. Morris of the Ministry of Defence has been associated with the project during the past year.

4. The main areas of research in the last year can be outlined as follows. At the request of the Central Statistical Office: the construction of commodity \times commodity input-output matrices and inverses on a variety of assumptions from the new tables of order 70 for 1963; the construction of 1954 input and output tables comparable with the tables for 1963. The construction of final tables for a publication on social accounting matrices and links between them. The development of programmes for a social accounting data bank and for adding to the facilities of 'A Regression Program for Titan'. The construction of commodity \times destination matrices for British exports over the postwar period. The comparison of the results of linear and non-linear expenditure systems for the analysis of consumers' behaviour. Applications of a form of vintage production function. Preliminary work on a short-term model linking our medium-term projections to the present and on the next set of projections for 1975 and 1980.

5. The following papers have been published since the previous Reports or will be published in the near future:

'The Revision of the SNA: an Outline of the New Structure', by Richard Stone (*National Accounts and Balances*, Central Statistical Office of Poland, Warsaw, 1968).

'A Comparison of the SNA and the MPS', by Richard Stone (*National Accounts and Balances*, Central Statistical Office of Poland, Warsaw, 1968).

Economic Planning in 1972: an Appraisal of 'The Task Ahead', by T.S. Barker and J.R.C. Lecomber (PEP broadsheet 515, 1969).

'A Review of Input-output Applications', by Alan Armstrong and D.C. Upton (*Bulletin of the International Statistical Institute*, forthcoming).

'Aggregation Error and Estimates of the U.K. Import Demand Function', by T.S. Barker (*Proceedings of the Southampton Conference*, forthcoming).

'RAS Projections where Two or More Complete Matrices are known', by J.R.C. Lecomber (*Economic Planning*, forthcoming).

'Estimating the Linear Expenditure System', by M.J. Green (*Bulletin of the International Statistical Institute*, forthcoming).

'Future Manpower Requirements of the British Economy', by Colin Leicester (*Mathematical Models for the Management of Manpower System*, English Universities Press, London, forthcoming).

'Input-Output and the Trading Economy', by J.R.C. Lecomber, paper presented to the 1968 Conference on Input-Output at Manchester, to be published in the Conference Proceedings.

'Production Models and Time Trends of Input-Output Coefficients', by K.J. Wigley, paper presented to the 1968 Conference on Input-Output at Manchester, to be published in the Conference Proceedings.

Financial Aspects of British Economic Growth

6. The project continues to devote a large part of its time to the compilation of statistical data, but is increasingly moving over to more analytical work and to model-building. On the statistical side the work of compiling a set of summary national balance-sheets for the Central Statistical Office was completed in July. The original intention to incorporate these into the Blue Book on *National Income and Expenditure* was changed because of the practical difficulties of incorporating a major set of statistics prepared by an outside body. The understanding now is that the C.S.O. will use the summary tables, together with a short article, in a subsequent issue of *Economic Trends*.

7. The work on the more detailed balance-sheet tables, together with transaction and revaluation tables, is in the process of being partially computerized. When completed this should enable the internal consistency of the estimates to be assessed far more quickly than has been the case in the past. The results of this work will appear in a forthcoming volume in the *Programme for Growth* series in the fairly near future.

8. On the more analytical side a considerable amount of work has now been done on the effects of wealth on personal saving. Mr Deaton read a paper on this subject at a seminar at the Bank of England. Work on this and on the components of saving is continuing. Sub-studies on personal saving through building societies and life-insurance companies are well advanced. A new survey of the owners of ordinary shares is being considered in response to a number of queries from city institutions.

9. The research staff engaged on the project have been Professor J.R.S. Revell (now of the University of Wales and consultant to the project), Mr A.R. Roe, Mr A.S. Deaton, Mr J.P. Moyle, and Mr F.E. Townson. The project is under the general direction of Professor Richard Stone.

10. A paper by Mr J.P. Moyle, 'A Valuation of Land and Buildings for the United Kingdom', appeared in *Chartered Surveyor, the Journal of the Royal Institution of Chartered Surveyors*, vol. 101, nos. 6 and 7, December 1968 and January 1969.

The Growth of Public Companies and its Finance

11. The inception, aims and earlier progress of this project were described in the Fifth, Sixth, Seventh, and Eighth Reports. During the past year work has been almost completed on two studies. These are Mr Singh's study of Take-Over Bids, which will be published in the *Monograph Series*, and Mr Whittington's study of Trade Credit.

12. Mr Whittington has also extended the earlier studies of company profitability, which now cover the full quoted company population from 1948 to 1961 and deal with a wider range of analytical questions.

13. Another aim of the project is to make data available to other research workers. During the year data have been provided to four research students in Cambridge and to the Universities of Stirling and Sussex.

The Economics of Developing Countries

14. Mr Bennathan, now Professor of Economics at Bristol University, is writing up the results of his investigation of ocean transport in its relation to the structure of Asian Trade. He expects to submit a full report to the United Nations Conference on Trade and Development during 1970.

15. Under the arrangement between the Ministry of Overseas Development and the Department, Mr Ward was seconded to the Fiji Government in September 1967 to set up a new statistical organization. During the past year, as the Government Statistician, he has been responsible, among

other things, for the publication of Fiji's first annual statistical abstract and a number of reports relating to the development of tourism in Fiji; the income and expenditure of urban households; and a consumer prices index. He also served on a committee appointed by the Governor to undertake a comprehensive review of the Fiji Customs Tariff and he provided evidence before Lord Denning at the Sugar Cane Contract Arbitration Proceedings. An article by Mr Ward, 'Effects of the United Kingdom Devaluation of Sterling on the Fiji Economy', appeared in the March 1969 issue of *The Economic Record*.

Current Economic Assessments

16. The London and Cambridge Economic Bulletin continued to be published during 1968-69 in *The Times Business News*. The Bulletin appears on two consecutive days in each quarter of the year and makes an assessment of the current economic situation in the United Kingdom. One of the Bulletins in 1968-69 gave an assessment of the state of the U.S. economy and the outlook for the future.

17. Offprints of the Bulletin in a fileable form are issued by the Department and the number of regular subscriptions to the Bulletin has increased since the Department took over this work. Statistical, secretarial and clerical services continue to be provided by the Department. Mrs T. Liesner remained as Secretary throughout the year. Mr M. F. Fuller resigned on 31 July 1969, and was succeeded as Statistician by Mr A. S. Deaton.

Economic Effects of Selective Employment Tax

18. Work on this project, under the direction of Professor Reddaway, continued along lines indicated in the previous Report. The research staff working with the Director during this academic year were as follows: Mr A. B. Atkinson, Dr C. J. Bliss, Mr P. M. Croxford, Mr A. H. M. Fels, Mr C. H. Fletcher, Mr K. D. George, Mr D. E. Moggridge, Mr J. S. O'Donnell, Mr C. F. Pratten, and Mr T. S. Ward. Of these, Mr Atkinson, Dr Bliss, Mr Moggridge, Mr George, and Mr Ward have been associated with the project on a part-time basis.

19. Though there is no strict timetable, it is obvious that the early production of results is highly desirable. It was therefore felt preferable to report the findings as they become available, even though they will be somewhat provisional, rather than postpone publication of results until the whole field of enquiry has been covered. Consequently, the target is to produce a First Report on distribution by the end of 1969. Despite delays in the receipt of information both from firms and from Government Departments, this target remained fairly realistic at the end of the academic year.

20. During the academic year much work was also done on the trades allied to distribution (hotels, catering and public houses, garages, shoe repairing, hairdressing); the results will appear as a second report which should be completed in the first half of 1970.

21. Construction, which the Treasury wished to be the next priority, is still a source of difficulty. Efforts to recruit a senior man for the work have been unsuccessful. It will therefore have to be done under the immediate supervision of the Director.

22. This leaves finance, the professions, laundries, entertainment and a host of miscellaneous trades to be tackled later—but it seems unlikely that all of them will be dealt with in detail.

23. At the request of the Treasury the findings will be published by H.M. Stationery Office. It is fully agreed, however, that the Department's position of 'impartiality and independence' is to be clearly stated.

24. Owing to the need for strict confidentiality up to the time of publication, no indication of preliminary findings can be given in this account of the work which has been carried out.

Productivity in Distribution

25. Since October 1968, work on the distributive trades has been concentrated on a study of channels of distribution. Mr K. D. George and Mr T. S. Ward are undertaking the research on the project. Work has been closely related to the enquiry into the Economic Effects of the Selective Employment Tax. A good deal of information has been collected from manufacturers in the form of a questionnaire, which has already been of use to that enquiry. In addition, the information,

which has been obtained from wholesalers through questionnaires and interviews for the S.E.T. enquiry, will prove extremely valuable to this project.

26. The project is now continuing in the form of six detailed case studies of the efficiency aspect of alternative methods of distributing goods from the manufacturer to the retailer. These studies will include some of the more interesting trades, such as Tobacco, Electrical Goods, Confectionery, where such factors as the ending of Resale Price Maintenance have had a significant impact. This will involve further approaches to manufacturers and wholesalers in order to get more detailed information on certain points.

International Freight Transport and Shipping Conferences

27. This research is being undertaken by Mr B. M. Deakin and Mrs T. Liesner under the general direction of Professor W. B. Reddaway. The long-term objective of the project is to throw light on the factors which facilitate or hamper the efficient working of international freight transport by sea.

28. The first phase of this research was described in the Eighth Report. The investigators have now moved on to more detailed study of three aspects of international freight transport by conference liners. First, the past and present very complex organization of shipping conferences is being investigated in respect of such aspects as agreements between members on the regulation of the trade. This includes a study of the extent and type of pooling arrangements (cargo and revenue), past and present policy on membership of conferences and the agreements with shippers, including the forms of rebates or contracts which have been used. Secondly, price information is being examined by studying across-the-board changes in all or most freight rates and also the changes in individual rates which take place independently. Work on the structure of freight rates has continued as part of the search for explanatory factors. Thirdly, the financial consequences of conference membership have been, and continue to be, studied for the value that can be derived from comparative analyses which, when coupled with the capacity utilization studies which have been going on at the same time, may be expected to throw light on the efficiency of this form of international freight transport by sea.

29. In September 1969 Mr Deakin and Mrs Liesner took part in a discussion on shipping conferences with the Rochdale Committee of Enquiry into Shipping.

The Effects of E.E.C. Entry on the Pattern of British Industry

30. This project attempts to shed light on the pattern of specialization in an enlarged E.E.C. In other words, the aim of the research is to obtain some indication of which British manufacturing industries would 'do well' in the event of United Kingdom entry (retain their hold on the home market and increase penetration of the E.E.C. market) and which industries would be adversely affected (these would be sectors where imports from the E.E.C. would prove very competitive, to the disadvantage of British firms).

31. The main tool of analysis is a statistical investigation of the comparative foreign trade performance of British and E.E.C. manufacturing industries over a recent period. The underlying assumption is thus that the pattern of trade prior to the introduction of free trade serves as an indicator of the pattern of exchange, and therefore of home production, after British entry.

32. The lines of further study very much depend on the nature of the evidence obtained from the statistical investigation. However, it is hoped that some work can be directed towards the implications of the suggested pattern of specialization for particular resources, the regional distribution of industry, and existing trends in the country's industrial structure.

33. The investigation is being carried out by Dr S. S. Han under the direction of Mr H. H. Liesner.

Influence of British Government Policies on Economic Development in the Regions

34. This study began in October 1968 under the direction of Professor Reddaway. It is being undertaken by Mr J. Rhodes, in collaboration with Mr A. Kan as Research Consultant.

35. In order to avoid duplication with other research projects being undertaken elsewhere on assessing the effectiveness of current regional policy measures on the manufacturing sector, this study is concentrating initially on assessing the scope for influencing the geographical distribution

of non-manufacturing activity serving national or international markets. The objective is to determine the extent to which office work and other non-manufacturing activity can be encouraged to provide more jobs outside the congested London and South-east region, and particularly in Development Areas.

36. Information is being collected, by interview, from organizations which have already moved either a part or the whole of their central office function from Central London. In addition some firms have been interviewed which have considered moving from Central London but have, in the event, decided against it, and others which have traditionally maintained their headquarters in the provinces. The wide range of organizations approached included the head offices of manufacturing firms, insurance companies, banks, book publishers, the offices of trade associations, and mail order houses. In the case of actual 'moves', many of which were found to be within a relatively short distance from London, the information included the extent to which head office activities were dispersed, the type of work transferred, the costs of the move, the effect of relocation on operating costs, and how successful the move had proved in relation to prior expectations. Particular attention was paid to how companies had persuaded key staff to leave Central London, the problem of hiring staff in the dispersed location, and to what extent movement had been influenced by the need to maintain good communications within the firm and with customers.

37. An assessment will be made of the effects of Government policy in this field. This is at present limited to the control of office building not only in London but in the whole of the South-east region and the West Midlands. Consideration will be given to alternative policy measures which could be adopted. The reaction of businessmen to possible incentives for non-manufacturing work to be dispersed to the Development Areas is being collected in order to ascertain at what point location decisions could be influenced by such Government financial inducements. An example of this would be whether or not a company planning to disperse activity from Central London to, say, Cheltenham would have been persuaded to move into the Welsh Development Area had financial incentives equivalent to five years free rent been available. It is hoped to arrive at an estimate of the likely Exchequer cost of such policies and their effectiveness in terms of the number of office jobs which might be diverted to the Development Areas.

Analysis of Patent Statistics

38. The historical study of British patent statistics, carried out by Mr J.P.P. Higgins under the direction of Mr A. Silberston, has been completed. They have been classified by industry and analysed on this basis to ascertain the short- and long-term relationships between inventive activity and other forms of economic activity, principally capital investment. The results of the analysis have been compared with the results suggested by similar work carried out in the United States. These results differ fundamentally from those reached on the basis of the American data and this has necessitated a reappraisal of the relationship between invention and investment. The results of the project are being written up and it is hoped to produce an Occasional Paper, *Invention and Economic Growth in Britain and the United States*, by J.P.P. Higgins, during 1970.

Economic Impact of the British Patent System

39. The industrial enquiry into patenting and licensing mentioned in the Eighth Report was begun early in 1969 and is now well on the way to completion. It is planned to obtain information by questionnaire and interview from about forty-five interested companies, including leading oil, chemical, and electrical groups, of which it is hoped that approximately half will supply detailed figures on patenting and licensing activity, research and development, sales, profits, etc. A special effort is being made to get good coverage in the key fields of pharmaceuticals and electronics.

40. This information will be combined with judgments of 'effects' to produce an assessment of the impact of the patent system on invention, innovation, and competition in the industries concerned.

41. It is expected that collection of data will continue into December 1969 and that analysis of the returns will start before the end of the year. It is also planned to turn attention at that time to other methods of approach and to other aspects of the system (such as its impact on very small firms). If all goes well the writing of Volume II of *The British Patent System* should begin in Spring 1970.

42. Mr C. T. Taylor has continued to work on the project under the direction of Mr A. Silberston.

Economic Implications of Seasonality for Agricultural Development Policies

43. The aim of this project, begun in October 1968, is to establish the nature of the technical, economic and social constraints imposed by the seasonality of agricultural production, as illustrated empirically in the cane-sugar sectors of Cuba and several Commonwealth countries, and to suggest certain technical and socio-economic changes that may be appropriate under given conditions. The study is being undertaken by Mr B.H. Pollitt, originally under the direction of Dr T. King and more recently under that of Mr A.B. Atkinson.

44. The first year of the project has been devoted primarily to the analysis of data for the Cuban cane-sugar sector over the period 1945-66, and a visit to Havana in the months April-June 1969 extended the time-period covered by the Cuban data to the current year.

45. Papers on the implications of seasonality for agricultural development with particular reference to Cuban experience have been read by Mr Pollitt during the year to the Institute of Economics and Statistics at the University of Oxford, the Centre des Hautes Etudes at the Sorbonne, and the Royal Institute for International Affairs in London.

British Historical Statistics

46. Since publisher's stocks of the *Abstract of British Historical Statistics* are beginning to run low, the idea of a new edition was broached in the spring of 1969. After discussions between the Director, the publisher, and the editor it was decided that, instead of a new edition, a supplementary volume covering the period since 1938 should be prepared. Space would be found in this for additional material for earlier periods. Preparation of the new volume began in June 1969, Mr H.G. Jones, an undergraduate at Trinity College, being employed to assist the editor, Dr B.R. Mitchell. The greater part of the collection of statistics was completed by September 1969. At present the text remains to be written, a few statistical tables have still to be completed, and the manuscript has to be prepared for the press. It is expected that this work will be finished by the end of 1969.

Economic Growth and Fluctuations in Eastern Europe

47. During 1968-69 two Czech visitors, Dr J. Goldmann and Dr J. Kohn-Flek, carried out research on this subject. It is hoped to publish the results of the project in an Occasional Paper, but the return of Dr Goldmann and Dr Kohn-Flek to Czechoslovakia has interrupted their work, and it is not known whether publication will be possible.

(b) Industrial Relations and Sociology

Management Organization and Industrial Relations

48. This study began in 1967 and was undertaken by Mr G. Roberts under the general direction of Professor H.A. Turner. The aims and methods of the project were outlined in the Eighth Report of the Department.

49. Information about individual production establishments is being sought under three main heads: economic and technical background circumstances (chiefly commercial policy, financial returns, size, ownership and technology); internal organization (particularly departmental specialization, standardization of operating procedures and the nature of decision-taking); and the labour relations practice—especially experience with shop steward organization and domestic negotiations. It is expected that the task of collecting the data will take about one year.

50. Following the departure of Mr G. Roberts for another appointment, the research is being undertaken by Mr D.J. Roberts, under the direction of Professor Turner. It is intended that Mr D.J. Roberts and Mr G. Roberts will maintain close contact during the enquiry.

Job Evaluation

51. The main study, described in the Seventh and Eighth Reports, has been completed, but the writing-up of the results has been delayed by difficulties in arranging suitable visits to Communist countries to check the information on the working of Communist systems of national pay-structure planning.

Labour Problems in Underdeveloped Countries

52. The first stage of this study, a statistical analysis comprising mainly an international comparison of wage movements, has been completed. This has thrown new light on the factors determining the rate of growth of real wages in developing countries, as well as on the latter's trends in employment and price inflation. It is also clear that labour market behaviour in the underdeveloped countries shows some very different features from that in the competitive or co-ordinated labour markets of the industrialized market and centrally planned economies, and the further implications of this for the structure of relative pay and other aspects are being explored.

53. As another part of the statistical analysis, Mr D. A. S. Jackson visited the ILO in January to obtain material from censuses of industrial production in order to examine the relation between wages and productivity; these data are being worked on in the light of certain recent theoretical papers, and it is hoped to cover over thirty countries in the results.

54. The other wing of this study consists in specific country studies. Mr Jackson visited Jamaica and Trinidad as part of this programme in March, and papers on these countries are nearly completed; these mainly deal with the reasons for growing unemployment in these countries despite their rapid rate of growth in output. During July Mr Jackson worked in Zambia preparing income and employment statistics from unpublished Government data, and afterwards visited Botswana, Tanzania, Kenya, and Uganda to examine employment and incomes problems and policies.

55. A paper, 'On the Stability of Wage Differences', arising from the international statistical analysis, was published in *The British Journal of Industrial Relations* in March. A further paper, 'Can Wages be Planned?', was presented to a Conference, *The Crisis in Planning*, at the Institute for Development Studies in June. Mr Jackson was later invited to a conference at the Institute for Labour Studies in Geneva to discuss the statistical methods for an international comparative study of patterns of industrial relations.

Labour Relations in Mining

56. The Seventh and Eighth Reports outlined the aims and progress of this research project and referred to publications to date. Professor H. A. Turner and Mr L. J. Handy expect to have a book ready for publication during the early months of 1970 which will contain the final results of the research.

Conditions of Employment of Manual and Non-manual Workers

57. The work on this project has been undertaken by Mrs J. C. Craig, directed by Mrs D. E. Wedderburn. A preliminary report has been completed on the postal enquiry referred to in the Eighth Report. It describes the formal terms and conditions of employment of men in a representative sample of manufacturing industry. Interviews in a small sub-sample of co-operating firms are producing some interesting additional information about promotion prospects, disciplinary measures, and the exercise of discretion by management in their treatment of different grades of employee.

58. Mrs Craig read a paper, prepared jointly with Mrs Wedderburn, on 'Relative Deprivation in Work', to the Sociology Section of the British Association annual meeting in September.

Variations in Trade Union Organization among White-collar Workers

59. This project, which began in October 1967, is being undertaken by Dr R. M. Blackburn, Dr K. Prandy, and Mr A. Stewart. The first stage, referred to in the Eighth Report, is complete. An examination is now being carried out of the causes of unionization among white-collar workers, particularly in terms of involvement in employment, but also taking account of the number and character of representative bodies available and the direct effects of certain non-work influences. In this study particular attention is being paid to the development of measures for the variables involved. To obtain the necessary data, highly structured interview schedules and questionnaires are now being administered to a large sample of white-collar employees. Dr Prandy has given a paper on this project to the Industrial Sociology Group of the British Sociological Association.

Social and Industrial Determinants of Workers' Attitudes

60. This research is concerned with two related problems: (a) the determinants of orientations and attitudes to work, and (b) the processes of selection in the labour market which determine how workers come to be in their jobs. The project, which began in October 1968, is being carried out by Dr R. M. Blackburn and Mr J. M. Mann. During the summer Mrs C. B. Stocking, of the National Opinion Research Center, University of Chicago, also took part.

61. The investigation is being carried out in a single labour market and is covering semi-skilled and unskilled workers. The first stage, now almost complete, has been to collect general information on the labour market, and to carry out intensive studies of the work organization, job content, and conditions in a sample of firms, including most of the major employers in the area. A further stage will entail interviewing samples of workers in these firms.

(c) New Research Projects

62. The following new research projects were planned to begin in 1969-70, the principal investigators being given in brackets:

- The Financial Structure in Operation: the Effect of Financial Pressure* (Mr A. T. K. Grant).
Production Conditions in Indian Agriculture—a Study based on Farm Management Surveys (Mrs K. Bharadwaj).
Optimal Planning in the U.S.S.R. (Dr C. H. Feinstein).
Comparative Structure and Scale (Mr A. Silberston).
Wage Determination and Wage Drift in the Construction Industry (Professor H. A. Turner).
Cost-Benefit Returns of Manpower Recruitment in the Steel Industry (Professor H. A. Turner).
The Role of Public and Private Capital Expenditure in the Development of Developing Countries (Professor W. B. Reddaway).

II. PUBLICATIONS

Monograph Series

63. This series, which is published by the Cambridge University Press, contains reports of investigations which have been carried out by members of the Department's research staff and others directly collaborating in its work. The following title was added during 1968-69 to the fourteen volumes listed in previous Reports.

No. 15. *Planning, Programming and Input-Output Models: Selected Papers with application to Indian Planning.* By A. GHOSH.

Forthcoming title:

No. 16. *Biproportional Matrices and Input-Output Change.* By MICHAEL BACHARACH.

Studies in the National Income and Expenditure of the United Kingdom

64. This series is published by the Cambridge University Press under the joint auspices of the Department and the National Institute of Economic and Social Research. It contains the results of research undertaken in both institutions under the general direction of Professor Richard Stone. Five volumes have appeared and were listed in previous Reports. The sixth and final volume will be published as:

National Income, Expenditure and Output of the United Kingdom, 1855-1965. By CHARLES FEINSTEIN.

Occasional Papers

65. This series, published for the Department by the Cambridge University Press, is designed for the rapid publication of research results which have a topical interest. The following titles were added in 1968-69 to the fifteen listed in previous Reports:

- No. 15. *Effects of U.K. Direct Investment Overseas: Final Report.* By W. B. REDDAWAY in collaboration with S. J. POTTER and C. T. TAYLOR.
No. 19. *The Return to Gold 1925: The Formulation of Economic Policy and its Critics.* By D. E. MOGGRIDGE.
No. 20. *Is Britain Really Strike-Prone? A Review of the Incidence, Character and Costs of Industrial Conflict.* By H. A. TURNER.
No. 21. *The Monopolies Commission in Action.* By ALISTER SUTHERLAND.

Forthcoming titles:

No. 17. *Productivity in Transport. A study of Employment, Capital, Output, Productivity and Technical Change.* By B.M. DEAKIN and T. SEWARD (published in November 1969).

No. 18. *Poverty in Britain and the Reform of Social Security.* By A.B. ATKINSON (published in January 1970).

A Programme for Growth

66. This series, published by Chapman and Hall Limited, describes the progress of the work on economic growth undertaken at the Department under the direction of Professor Richard Stone. The eight volumes which have so far appeared have been listed in previous Reports.

Cambridge Studies in Sociology

67. The Cambridge University Press is publishing this series of monographs on subjects of both theoretical and social interest, and based on the findings of empirical sociological investigations. The first two published volumes are:

The Affluent Worker: Industrial Attitudes and Behaviour. By J.H. GOLDTHORPE, DAVID LOCKWOOD, FRANK BECHHOFFER, and JENNIFER PLATT.

The Affluent Workers: Political Attitudes and Behaviour. By J.H. GOLDTHORPE, DAVID LOCKWOOD, FRANK BECHHOFFER, and JENNIFER PLATT.

Forthcoming volumes:

The Affluent Worker in the Class Structure. By J.H. GOLDTHORPE, DAVID LOCKWOOD, FRANK BECHHOFFER, and JENNIFER PLATT.

Men in Mid-Career. By C. SOFER.

Family Structure in Nineteenth-century Lancashire. By M. ANDERSON.

Cambridge Papers in Sociology

68. This series, to be published by the Cambridge University Press, is intended to provide rapid publication of works which are between journal articles and monographs in length. The first volumes will be:

Perceptions of Work: Variations within a Factory. By R.M. BLACKBURN and H. BEYNON.

Workers' Attitudes and Technology. By DOROTHY WEDDERBURN and ROSEMARY CROMPTON.

Size of Industrial Organization and Worker Behaviour. By G.K. INGHAM.

Reprint Series

69. These are selected papers which members of the Department's research staff and others working in direct collaboration with the Department have contributed to learned journals and other publications. During the year the following thirteen titles, which are listed in alphabetical order of authors, have been added:

DEANE, PHYLLIS. *Aggregate Comparisons: The Validity and Reliability of Economic Data* (chapter XI of *Comparative Research across Cultures and Nations*, The Hague, 1968; Reprint no. 287).

FORES, M.J. *No More General Theories?* (*Economic Journal*, vol. LXXIX, no. 313, March 1969; Reprint no. 302).

GOLDTHORPE, JOHN H., LOCKWOOD, DAVID, BECHHOFFER, FRANK and PLATT, JENNIFER. *The Affluent Worker and the Thesis of 'Embourgeoisement': Some Preliminary Research Findings* (*Sociology*, vol. 1, no. 1, January 1967; Reprint no. 281).

LEICESTER, C.S. *Tomorrow's World, and Social Technology* (two papers from a special issue of *Where*, December 1968; Reprint no. 300).

MOYLE, JOHN. *A Valuation of Land and Buildings for the United Kingdom* (*Chartered Surveyor, the Journal of The Royal Institution of Chartered Surveyors*, vol. 101, nos. 6 and 7, December 1968 and January 1969; Reprint no. 298).

PANIĆ, M. *Gross Fixed Capital Formation and Economic Growth in the United Kingdom and West Germany 1954-1964* (*Bulletin of the Oxford Institute of Economics and Statistics*, vol. 29, no. 4, November 1967; Reprint no. 289).

SILBERSTON, AUBREY and PRATTEN, C.F. *International Comparisons of Labour Productivity in the Automobile Industry, 1950-1965.* (*Bulletin of the Oxford Institute of Economics and Statistics*, vol. 29, no. 4, November 1967; Reprint no. 288).

SILBERSTON, AUBREY. *Nationalized and Private Industry—Can their Objectives be the Same?* (*British Steel*, no. 4, March 1969; Reprint no. 301).

STONE, RICHARD and BROWN, ALAN. *Behavioural and Technical Change in Economic Models* (a paper presented at the International Economic Association Conference, Vienna 1962, which appeared as chapter 25 of *Problems in Economic Development*, London 1965; Reprint no. 286).

STONE, RICHARD. *The Generation, Distribution and Use of Income* (*Review of the International Statistical Institute*, vol. 36, no. 2; Reprint no. 291).

STONE, RICHARD. *Consistent Projections in Multi-sector Models* (a paper presented at the International Economic Association Conference, Cambridge 1963, which appeared as chapter 9 of *Activity Analysis in the Theory of Growth and Planning*, London 1969; Reprint no. 296).

STONE, RICHARD. *Input-Output Projections: Consistent Prices and Quantity Structures* (*L'Industria*, no. 2, 1968; Reprint no. 297).

TURNER, H.A. and JACKSON, D.A.S. *On the Stability of Wage Differences and Productivity-based Wage Policies: An International Analysis* (*British Journal of Industrial Relations*, vol. VII, no. 1, 1969; Reprint no. 303).

III. OTHER ACTIVITIES

Seminars

70. During the year eleven research papers, of which seven were given by visiting economists, have been read at seminars held under the joint auspices of the Department and of the Faculty of Economics and Politics.

71. Nine papers were given in the series of seminars on Mathematical Economics and Econometrics. Visiting economists contributed six of these.

University Relationships

72. Many teaching officers of the Faculty of Economics and Politics have directed, or otherwise taken part in, the research projects carried out by the Department. Members of the Department's staff have given lectures or taken classes for the Faculty, and nearly all of them supervise undergraduates studying economics, economic history, or sociology. The Department has provided Faculty teaching officers with secretarial and computing assistance, as well as advice on electronic programming and data analysis. It has also assisted Research Students attached to the Faculty.

73. The Department has been afforded much-valued computing facilities by the University Mathematical Laboratory, the Financial Board, and the Institute of Theoretical Astronomy.

Relationships with Other Bodies

74. Financial assistance which the Department has received from outside bodies is dealt with in Section IV. Help of other kinds has come from many sources including the Central Statistical Office, the Ministry of Overseas Development, the Ministry of Labour, the Department of Economic Affairs, the Board of Trade, the Social Science Research Council, the National Coal Board, the Bank of England, the Imperial Institute, and a large number of industrial, shipping and business firms, trade and professional associations, and trade unions.

Visitors

75. The following visiting economists have worked in the Department during the year under review:

Professor J. Cohen, of the University of Pittsburgh.

Dr J. Goldmann, of the Institute of Economics, Czechoslovak Academy of Sciences.

Dr J. Kohn-Flek, of the Institute of Economics, Czechoslovak Academy of Sciences.

Wing-Commander R. Morris, R.A.F., of the Ministry of Defence.

Mr G. Zaman, of the Institute of Economic Research, Bucharest.

IV. FINANCE

76. The Department's annual expenditure has risen from £101,568 in 1967-68 to £114,403 in 1968-69. Nearly 90 per cent. of the expenditure, in both years, was on stipends, wages, and related payments.

77. The annual grant which the University makes to the Department is not increased to take account of increased activities or higher costs generally. It is increased to allow for higher scales of stipends and wages, but only to the extent of eleven-eightieths of the additional cost of a notional establishment based on that which existed in 1956. Accordingly the University grant rose from £43,529 in 1967-68 to £45,732 in 1968-69, an increase of £2,203, while expenditure rose by £12,835.

78. The following are the principal new or additional payments by outside bodies which have been accepted during the year, for payment over various periods. In most cases these come as grants in support of specific projects, but in some cases as donations to the Department's Research Account (which can be used for a wide range of purposes, not necessarily connected with any specific project):

	£
Social Science Research Council	38,910
H.M. Treasury	10,000
Ministry of Overseas Development	6,623
Ford Foundation	3,042
Other donors	757
TOTAL	£59,332

79. 87 per cent. of the Department's expenditure in 1968-69 was covered by grants from outside bodies.

V. STAFF

Research Staff

80. The research staff at September 1969 was as follows:

Director: Professor W.B. REDDAWAY, M.A. (Cantab.), F.B.A., Fellow of Clare College.

Special Appointment: Miss L.J. SLATER, Sc.D., Ph.D. (Cantab.), D.Litt., Ph.D., M.A. (London), Fellow of Lucy Cavendish College.

Senior Research Officers: Mr R.M. BLACKBURN, M.A. (Cantab.), Ph.D. (Liverpool), Fellow of Clare College; Mr B.M. DEAKIN, M.A. (Cantab.), M.A. (Oxon.), Fellow of Magdalene College.

Research Officers: Mr A.G. ARMSTRONG, M.A. (Cantab.), Fellow of Selwyn College; Mrs J.C. CRAIG, M.A. (Cantab.), B.Sc. (London); Mr S.S. HAN, D.Phil. (York), B.A. (Yonsei), M.P.A. (Seoul); Mr O.T. HOOKER, M.A. (Cantab.), B.Sc. (Econ.) (London); Mr J.R.C. LECOMBER, M.A. (Cantab.), B.A. (Oxon.); Mr C.S. LEICESTER, M.A. (Cantab.); Mrs T. LIESNER, M.A. (Cantab.), B.Sc. (Econ.) (London), Fellow of Girton College; Mr B.H. POLLITT, B.A. (Cantab.); Mr K. PRANDY, M.A. (Cantab.), Ph.D. (Liverpool), B.Sc. (Econ.) (London), Fellow of Fitzwilliam College; Mr C.F. PRATTEN, B.A. (Bristol), Fellow of Trinity Hall; Mr J. RHODES, B.A. (Liverpool); Mr A.R. ROE, M.Sc. (Wales), B.Com. (Leeds); Mr A. STEWART, B.Sc. (Econ.) (London); Mr C.T. TAYLOR, B.A. (Cantab.), M.A. (McGill); Mr M.P. WARD, M.A. (Cantab.), B.A. (Exeter), Fellow of Selwyn College; Mr G. WHITTINGTON, M.A. (Cantab.), B.Sc. (Econ.) (London), Fellow of Fitzwilliam College; Mr K.J. WIGLEY, M.A. (Cantab.), Fellow of Corpus Christi College.

Junior Research Officers: Mr T.S. BARKER, M.A. (Cantab.), M.A. (Edin.), Fellow of Downing College; Mr P.M. CROXFORD, B.A. (Exeter); Mr A.S. DEATON, B.A. (Cantab.); Mr C.H. FLETCHER, B.A. (Exeter); Mr M.J. GREEN, M.A. (Cantab.), B.A. (Exeter); Mr L.J. HANDY, M.A. (Cantab.), B.A. (Leeds); Mr D.A.S. JACKSON, B.A., B.Phil. (Oxon.); Mr J.M. MANN, B.A. (Oxon.); Mr D.E. MOGGGRIDGE, M.A. (Cantab.), B.A. (Toronto), Research Fellow of Clare College; Mr T.S. WARD, B.A. (Wales), M.A. (Econ.) (Manchester).

Research Consultants: Mr T.A.J. COCKERILL, B.A. (Leeds); Mr E.W. DAVIS, M.A. (St Andrews); Mr A.H.M. FELS, B.Ec., LL.B. (Western Australia); Mr A. KAN, M.Comm. (Melbourne); Mr J.P. MOYLE, B.Sc. (Manchester), F.R.I.C.S.; Mr F.E. TOWNSON.

81. The following, although not formally holding University posts in the Department, are closely associated with the Department's research activities:

Faculty Teaching Officers

Mr A.B. ATKINSON, B.A. (Cantab.), Fellow of St John's College, University Assistant Lecturer in Economics.

Mr C.J. BLISS, Ph.D., M.A. (Cantab.), Fellow of Christ's College, University Lecturer in Economics.

Miss P.M. DEANE, M.A. (Cantab.), M.A. (Glasgow), Fellow of Newnham College, University Lecturer in Economics.

Mr C.H. FEINSTEIN, Ph.D. (Cantab.), B.Comm. (Witwatersrand), Fellow and Senior Tutor of Clare College, University Lecturer in Economics.

Mr K.D. GEORGE, M.A. (Cantab.), M.A. (Wales), Fellow of Sidney Sussex College, University Lecturer in Economics.

Mr A.T.K. GRANT, C.B., C.M.G., M.A. (Cantab.), M.A. (Oxon.), Fellow of Pembroke College, Librarian-Secretary of the Faculty of Economics and Politics.

Mr R.T.F. KING, M.A. (Cantab.), Ph.D. (California), Fellow of Queens' College, University Lecturer in Economics.

Mr H.H. LIESNER, M.A. (Cantab.), B.A. (Bristol), Fellow of Emmanuel College, University Lecturer in Economics.

Mr B.R. MITCHELL, Ph.D. (Cantab.), M.A. (Aberdeen), Fellow of Trinity College, University Lecturer in Economics.

Mr A. SILBERSTON, M.A. (Cantab.), Fellow of St John's College, University Lecturer in Economics.

Mr A. SINGH, M.A. (Cantab.), M.A. (Howard), B.A. (Punjab), Fellow of Queens' College, University Lecturer in Economics.

Professor RICHARD STONE, C.B.E., Sc.D., M.A. (Cantab.), F.B.A., Fellow of King's College, P.D. Leake Professor of Finance and Accounting.

Professor H.A. TURNER, Ph.D. (Manchester), M.A. (Cantab.), B.Sc. (Econ.) (London), Fellow of Churchill College, Montague Burton Professor of Industrial Relations.

Other Research Associates

Mr J.H. GOLDTHORPE, M.A. (Cantab.), B.A. (London), Fellow of Nuffield College, Oxford.

Professor J.R.S. REVELL, M.A. (Cantab.), B.Sc. (Econ.) (London), Professor of Economics, University College of North Wales.

Mr E.J. ROBERTSON, M.A., M.Ed. (St Andrews).

Mrs C.B. STOCKING, B.A. (Oberlin), M.A. (Columbia).

Mrs D.E. WEDDERBURN, M.A. (Cantab.), Lecturer at the Imperial College of Science and Technology, University of London.

82. During the period covered by this Report the following members of the research staff left the Department to take the posts mentioned in brackets:

Mr M.L.O. FABER, M.A. (Cantab.), B.A. (Oxon.), Special Appointment. (Senior Lecturer and Alternate Director of the Overseas Development Group, University of East Anglia.)

Mr J.R.S. REVELL, M.A. (Cantab.), B.Sc. (Econ.) (London), Senior Research Officer. (Professor of Economics, University College of North Wales, Bangor.)

Mr H.T. BURLEY, Ph.D., M.A. (Cantab.), B.Econ. (Adelaide), Research Officer. (Senior Lecturer in Economics, La Trobe University, Australia.)

Mr M.J. FORES, B.A. (Cantab.), Research Officer. (Economic Adviser, Board of Trade.)

Mr G. ROBERTS, M.A. (Econ.), B.A. (Comm.) (Manchester), Research Officer. (Senior Industrial Relations Adviser, Prices and Incomes Board.)

Mr J.P.P. HIGGINS, B.Sc. (Econ.) (London), Junior Research Officer. (Lecturer in the Department of Economic History, University of Sheffield.)

Assistant Staff

83. The following is a list of the assistant staff at September 1969:

Secretary: Mr H. LOSHAK.

Administrative Officer: Mr R.C. LAWRENCE.

Librarian: Miss O.E. HICKSON.

Secretarial and Clerical Staff: Mrs L.E. SILK (Senior Typist); Miss T.J. BROWN; Mrs J.R. CONNOR; Mrs M.J. GRIBBIN; Miss T.C. GURNER; Miss C.A. HUDSON; Mrs H. KARIA, B.Sc. (Gujarat); Miss P. RAYMENT; Miss V.A. SHATFORD; Miss V.A. STANTON; Miss A.C. TWYMAN.

Computing and Statistical Staff: Miss M.R. CLARKE (Senior Computer); Mr E.D. BOUGOURD; Mrs R. COE; Miss B.V. COOK; Miss D.M. DAY; Miss L. NEWMAN; Mr J.S. O'DONNELL, B.A. (Cantab.); Miss S.D. SEAL; Miss P.A. SEABY; Mr R.M. SMITH; Mrs U.D.W. SURIYAARACHCHI, B.A. (Econ.) (Ceylon).

Directorship

84. Professor W.B. Reddaway's tenure as Director, which began in 1955, came to an end on 30 September 1969, but he is continuing as Acting-Director for a year, until his successor is available. The Hon. W.A.H. Godley has been elected into the Directorship for a period of ten years from 1 October 1970.

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