

UNIVERSITY OF CAMBRIDGE

DEPARTMENT OF
APPLIED ECONOMICS

TENTH REPORT
ACTIVITIES IN THE PERIOD
OCTOBER 1969 TO SEPTEMBER 1970



April 1971



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Acting Director
W.B.REDDAWAY

Committee of Management, September 1970

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D.G.CHAMPERNOWNE	H.H.LIESNER
Miss P.M.DEANE	Professor W.B.REDDAWAY
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	Professor H.A.TURNER

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H.LOSHAK

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TENTH REPORT OF THE DEPARTMENT OF APPLIED ECONOMICS

(covering the year October 1969 to September 1970)

I. Research Activities

1. This section outlines the work done in 1969-70 on the twenty-six research projects being conducted, and lists the eight new ones which start in the current academic 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 the lines described in previous Reports. A further volume, no. 10, entitled *The Determinants of Britain's Visible Imports*, 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. Research staff working with Professor Stone during the period covered by this Report were as follows: Mr A.G. Armstrong, Mr T.S. Barker, Mr O.T. Hooker, Mr M.A. King, Mr C.S. Leicester, Mr D.A. Livesey, Dr L.J. Slater, Mr J.D. Sugden, Mr K.J. Wigley, and Mr V.H. Woodward. Mr A.G. Armstrong and Mr O.T. Hooker left the project at the end of December 1969 and in July 1970 respectively, and Mr V.H. Woodward joined in February 1970. Mr J.D. Sugden and Mr K.J. Wigley were associated with the project on a part-time basis. The following visitors have also been associated with the project during the period of this Report: Mr M. Inoue, Group-Captain R. Morris, Mr A. Mossin, Mr L.N. Rastogi, and Mr P. Venkatramiah.

4. Work on the long-term steady-state model of the British economy has continued with, first, revisions to the basic data, to bring them into line with the National Accounts based on 1963 prices and, secondly, a complete rewriting of the computer program to incorporate relationships between labour, capital, and industrial output. Preliminary projections of the economy forward to 1975 have been made.

5. A transitional model, more aggregated than the long-term model, is being constructed to simulate the year-to-year development of the British economy, emphasis being placed on the influence of instruments of economic policy. There are three main functions of this model: first, the forecasting of the past as a test of the model's structure; secondly, as the first stage in developing a control model for the economy; and thirdly, as a means of projecting the transitional path between the past and future (projections given by the long-term model). Work has proceeded on the basic data for this model.

6. A report was presented to the Shopping Capacity Sub-Committee of the National Economic Development Office on 'Projections of Consumers' Expenditures in the United Kingdom for 1975 and 1980 in nine expenditure categories'.

7. Further work has been done in constructing consistent data for the British Economy 1948-66. At the request of the Central Statistical Office an input-output table for 1954 comparable with that published for 1963 is being estimated. The 1963 Census of Production has also been utilized to improve our information on the engineering sector.

8. Three papers were given by members of the project to the Second World Congress of the Econometric Society held in Cambridge in September 1970: 'A vintage investment model', by M.A. King; 'The modelling and control of the U.K. economy' by D.A. Livesey; and 'Random walks through the social sciences' by Richard Stone.

9. The following papers have been published since the previous Report:

'A computerised data bank', by A.G. Armstrong and L.J. Slater (*The Econometric Study of the United Kingdom*, London, 1970).

'A review of input-output applications', by A.G. Armstrong and D.C. Upton (*Bulletin of the International Statistical Institute*, vol. XLIII, Book 1, 1969).

'Foreign trade and full employment', by Richard Stone (*L'Industria*, no. 3, 1969).

'Time trends of input-output coefficients', by K. Wigley (*Input-Output in the United Kingdom*, London, 1970).

'An econometric model for national manpower planning', by C.S. Leicester (*Aspects of Manpower Planning*, London, 1970).

'Some computer applications in quantitative economics with especial reference to the estimation of integrated demand systems', by Michael Green (*Bulletin of the International Statistical Institute*, vol. XLIII, Book 1, 1969).

'Aggregation error and estimates of the U.K. import demand functions', by Terence Barker (*The Econometric Study of the United Kingdom*, London, 1970).

'Input-output and the trading economy', by Richard Lecomber (*Input-Output in the United Kingdom*, London, 1970).

'The import content of final expenditures for the United Kingdom 1954-1972', by Terence Barker and Richard Lecomber (*Bulletin of the Oxford Institute of Economics and Statistics*, vol. 32, no. 1, 1970).

FINANCIAL ASPECTS OF BRITISH ECONOMIC GROWTH

10. The research staff engaged on the project have been Mr A.S. Deaton, Mr J. Moyle, Mr A.R. Roe, Mr F.E. Townson. (The statistical assistant, Mrs U.D. Suriyaarachchi, resigned in May.)

11. The statistical work on the compilation of sector balance-sheets and financial transaction accounts is now substantially complete with data available up to and including December 1966. This work is going to be taken over by the Bank of England from mid-1971. In anticipation of this take-over the working papers are now being sorted out. There are many areas in which the data are not fully satisfactory and in which there is a strong case for undertaking further work of a purely statistical nature. There is however an even stronger case for pausing at this juncture and giving more thought to the analytical usefulness of the data. This is seen as the first priority of the project. It would be undesirable to duplicate the experience of the U.S. where detailed financial data have been available for some fifteen years but where the uses of the data for analytical purposes have been virtually non-existent.

12. The only work of a purely statistical nature which is now in progress concerns a new survey of the holders of quoted ordinary shares. This was deemed necessary in order to resolve the substantial uncertainties about how the pattern of holdings has evolved over the last seven or eight years. The fieldwork on the undertaking should be completed by the spring of 1971.

13. Work on financial analyses continues on two fronts. Mr Deaton is working with the problem of wealth effects in consumption and with the incorporation of savings behaviour into analyses of spending patterns based on expenditure systems. Several discussion papers have been written concerning these two issues.

14. Mr Roe is examining the possibilities of using the national balance-sheet framework and data for model building purposes. It would appear that this kind of approach may be more appropriate for some analytical purposes than the conventional financial model building of the FRB-MIT sort.

15. A paper by A.S. Deaton and K. Wigley entitled 'Econometric Models for the Personal Sector' was presented at the Second World Congress of the Econometric Society in September 1970. An article entitled 'The Stability of Contractual Saving through the Building Societies' by A.R. Roe appeared in *Building Societies Gazette* in August 1970.

16. Forthcoming publications include an article in *Economic Trends* entitled 'National Balance Sheets and Social Accounting' by Professor J.R.S. Revell and A.R. Roe, and paper No. 11, the title of which is yet to be decided, in *A Programme for Growth*.

17. The inception, aims, and earlier progress of this project were described in previous reports. The main activity of the project during the last year was centred on completing and preparing for the press two studies: Mr A. Singh's study of takeover bids and Mr G. Whittington's study of trade credit. Mr Singh's Monograph *Takeovers: Their Relevance to the Stock Market and the Theory of the Firm* will be published by Cambridge University Press in 1971. It is also hoped to publish in 1971 an Occasional Paper by Mr Whittington entitled *The Prediction of Profitability and other Studies of Company Behaviour*.

18. In relation to some of the issues raised in their joint work on the book *Growth, Profitability and Valuation* (Occasional Paper No. 7) Mr Singh and Mr Whittington prepared a short paper: 'Growth, profitability and valuation: a comment', which was circulated by the Department in August 1970.

19. In December 1969 Mr Singh was invited to give a course of lectures on 'The Theory of the Firm' at the Faculty of Economics of the University of Sienna. He also gave seminar papers on the subject 'Takeovers, the Stock Market and the Theory of the Firm' at staff seminars at the Universities of Sienna and Rome.

CURRENT ECONOMIC ASSESSMENTS

20. The London and Cambridge Economic Bulletin continued to be published quarterly during 1969-70 in *The Times Business News*. The Bulletin is concerned mainly with the current economic situation in the United Kingdom, but it is usual for one issue each year to be devoted to the economic situation in other countries. In 1969-70 the July issue gave an assessment of the current economic situation in the United States.

21. The number of regular subscriptions for the reprint of the Bulletin was well maintained in 1969-70. Miss S.D. Seal is in charge of the subscription list. Statistical, secretarial, and clerical services were provided by the Department. Mr A.S. Deaton resigned as Statistician at the end of August 1970 and was succeeded by Mr C.H. Fletcher. Mrs T. Liesner remained as Secretary throughout the year.

ECONOMIC EFFECTS OF SELECTIVE EMPLOYMENT TAX

22. The investigation of the distributive trades, the subject of earlier progress reports, was completed in January 1970 and published by Her Majesty's Stationery Office in March 1970 under the title *The Effects of the Selective Employment Tax: First Report, The Distributive Trades*.

23. The Report attempts to quantify the effects of S.E.T. on prices, margins, and productivity. It also examines popular misconceptions concerning the objectives of the tax and the anomalies in its workings (including their policy implications), and it gives a tentative assessment of the direct influence S.E.T. has had on various business practices.

24. The collection of statistics for a Second Report on 'near-distribution' was approaching completion, when the advent of a Conservative Government, pledged to abolish S.E.T., necessarily led to a considerable change of plan.

25. The one further publication now envisaged is a 'Final Report' dealing with the 'near-distributive' trades, together with such general points as can be examined on the basis of information which is readily available. In particular, an attempt will be made to produce a simple 'historical record' for the whole S.E.T. field.

26. The research workers engaged wholly or partly on the project during this academic year, apart from the Acting Director, were: 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, Mr J.D. Sugden, and Mr T.S. Ward.

PRODUCTIVITY IN DISTRIBUTION

27. As outlined in the Ninth Report, work on this project has been directed towards a study of the channels of distribution of six classes of commodity, consisting of Tobacco, Confectionery, Domestic electrical appliances, Hardware, Floor coverings, and Pharmaceutical preparations.

28. A central objective of the research is to assess the effects of the progressive ending of resale price maintenance on methods of distribution and on distributive margins. This has involved a close examination of the underlying situation and of long-term trends. Such factors as the structure of the distributive trades and of the relevant production sectors, and the changes that have occurred in recent years, are of importance here.

29. Information which was collected during the course of the Selective Employment Tax enquiry from manufacturers, wholesalers, and retailers, has been available. In addition, published statistics, such as those in the Censuses of Distribution and Production, have been of use. A start has been made on interviewing a sample of manufacturers in each trade, which will provide further details on channels of distribution and distributive margins, as well as an opportunity for exploring a number of 'policy' points.

30. Mr T.S. Ward has continued to work on the project under the direction of Mr K.D. George.

INTERNATIONAL FREIGHT TRANSPORT AND SHIPPING CONFERENCES

31. 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.

32. The earlier phases of this research were described in the Eighth and Ninth Reports. During the past academic year the research was extended to include a third conference group and to cover more detailed studies of the structure of relative prices in conference liner shipping services. Work on the origins and circumstances of the establishment and development of the conference system from 1875 to 1939 has been largely completed and is being written up. The coverage of work on recent and present methods of organizing and operating shipping conferences has been extended to the third group of conferences and routes, and has included pooling and other trade sharing arrangements, the ways in which such arrangements operate, and their traceable effects. Research into price formation has involved the taking of a census of the cargoes of certain vessels in the conventional and container trades covered by the conferences under study. These data are being used as a basis for statistical analyses designed to throw light on the various factors which are influential in the formation of the structure of relative prices. Economic and financial analyses of the consequences to shipowners of conference membership have been undertaken in order to test a number of hypotheses about profitability and resource utilization.

THE EFFECTS OF E.E.C. ENTRY ON THE PATTERN OF BRITISH INDUSTRY

33. Work continued during the year and it is hoped to publish an Occasional Paper in 1971, giving the results of the investigation, which was 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. The aim of this project 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. The study, which began in October 1968, is being undertaken by Mr J. Rhodes under the direction of Professor Reddaway. Mr A. Kan worked on the project as a visitor to the Department during 1969.

35. During the academic year work has continued along the lines described in the Ninth Report. The task of collecting information from eighty organizations which had already moved some central office functions from London was facilitated by a general willingness among those approached to co-operate in the enquiry, and was virtually completed by April 1970. The analysis and writing-up are now well advanced. An assessment of the effects of existing Government policy in this field has highlighted the need for policy changes. Consideration has been given to alternative policy measures which could be adopted and their likely effectiveness and cost to the

Exchequer. The general conclusion which emerges is that office work (and probably other non-manufacturing parts of the economy) could contribute more to regional policy objectives than has hitherto been the case. The results will be published as an Occasional Paper in 1971.

36. In June 1970 Mr Rhodes presented some preliminary results to a conference on office location policy at the London School of Economics organized by the Location of Offices Bureau.

ECONOMIC IMPACT OF THE BRITISH PATENT SYSTEM

37. Apart from the checking of detailed points that inevitably accompanies the writing-up of this sort of research, the industrial enquiry for this project has been completed, and the analysis of returns is in an advanced state. Some thirty major oil, chemical, engineering, and textile firms have supplied detailed figures (although not as many as we hoped in some cases) and have participated in interview sessions at which the impact of patents on their operations has been discussed. A further fifteen have helped by supplying briefer material and have also been interviewed.

38. The complexity and subtlety of the patent picture and the misleading impression that can be given by mere numbers of patents, licence fees, etc., are striking. The core of the study will therefore probably consist of a series of sub-studies of the five industry groups examined. These will deal to some extent with the organization and technical background of the industries as well as with patenting and licensing activity.

39. Work on the writing of Volume II of *The British Patent System* is well in hand and the first five chapters are now in draft. These deal with, among other things, the general economic issues surrounding a patent system, research by other investigators, and a statistical profile of patents, research and development, and productivity in British manufacturing, using the somewhat sketchy published data that are available.

40. One area of the subject to which some attention has yet to be given is that of the small inventor. This is a difficult area to tackle, but it is hoped to obtain enough material for a useful review, probably with the help of such bodies as National Research Development Corporation and the Institute of Patentees and Inventors.

41. Mr C.T. Taylor continued to be engaged full time on the project, under the direction of Mr A. Silberston.

ECONOMIC IMPLICATIONS OF SEASONALITY FOR AGRICULTURAL DEVELOPMENT POLICIES

42. The initial aim of this project, begun in October 1968, was 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 was undertaken by Mr B.H. Pollitt, originally under the direction of Dr T. King and subsequently under that of Mr A. B. Atkinson.

43. The scope of this project, given the resources available for its execution, proved to be too great. Accordingly, from October 1969 it was restricted to a more specialized analysis of Cuban experience although the availability of new data for the period 1967-69 permitted the time period covered to be extended.

44. Papers on the implications of seasonality for agricultural development with particular reference to Cuban experience have been given by Mr Pollitt at several British Universities, and at the Royal Institute for International Affairs, over the period October 1968-October 1970. Papers were also read at the Centre des Hautes Etudes at the Sorbonne and at the Organization for European Co-operation and Development. A Paper under the title of 'Employment Plans, Performance and Future Prospects in Cuba', with particular reference to the agricultural sector, will be published in the *Proceedings of the 1970 Cambridge Overseas Studies Committee Conference on Prospects for Employment Opportunities in the 1970s* (and possibly as an Occasional Paper of the D.A.E.).

45. While this project is now formally concluded, Mr Pollitt will continue to work on it privately, and its findings will be published more fully in due course.

BRITISH HISTORICAL STATISTICS

46. The greater part of the statistics had been collected before the beginning of 1969-70. Between October and the end of December 1969 Dr B.R. Mitchell completed this task, and between then and March wrote the text and prepared the manuscript for publication. It is hoped to publish the volume, *The Second Abstract of British Historical Statistics*, early in 1971.

THE FINANCIAL STRUCTURE IN OPERATION

47. This study was started towards the end of 1969 and is being carried out by Mr E.W. Davis under the direction of Mr A. T. K. Grant. The object is to explore the effects of a continued period of financial stringency both on the financial structure itself and on the policies and progress of the business undertakings which it is designed to serve.

48. The research is so far being pursued in two directions. The first - in large measure based on discussions with financial institutions in the City and with some elsewhere - seeks to examine the shifts in the established channels of finance and the stimulus to new sources and practices both inside and outside the banking system. Two articles by Mr Davis, under the title of 'Financial Innovation and the Credit Squeeze', outlining these developments, are appearing in the November and December 1970 issues of the *Bankers Magazine*. In view of the cumulatively increasing dependence of companies on institutional finance, future developments will be followed with interest.

49. The second direction on which work is now in progress is concerned with trying to measure the effects of prolonged tight money policy on selected sectors of British manufacturing industry. Here attention is being directed at the potentially discriminatory aspects of credit administration and the divergent experience of different classes of borrower when subject to pressure.

COMPARATIVE STRUCTURE AND SCALE

50. Work on this project commenced on 1 October 1969 and is being undertaken by Mr T. A. J. Cockerill and Mr C. F. Pratten under the general direction of Mr A. Silberston. An attempt is being made to carry out an international comparison of the relationship between structure and performance in a small number of industries. Particular attention is being paid to the extent to which any economies of scale which are potentially available are obtained in practice. The industries being examined initially are automobiles, brewing, electric motors and generators, garments, man-made fibres, and steel. The major developed countries of Western Europe, North America, and Asia are covered by the enquiry. The first year's work has been in three stages. First, data relating to the structure and performance of each industry in each country have been obtained from published and other sources, and this information is being analysed. Secondly, a more detailed study of each of the industries in the United States has been started. A sample of firms have completed extended questionnaires, and during a visit to the U.S.A. in September Mr Cockerill held interviews with each of the responding firms, and also with Trade Associations and Departments of the Federal Government. Thirdly, a detailed study of the structure of each industry in the United Kingdom has begun, and initial interviews have been conducted with respondents from a sample of firms. During the next year it is hoped to complete these lines of enquiry, to develop studies of the industries in the other countries covered by the investigation, and to begin preparation of the detailed international comparisons of each industry which are at present intended to form the major part of the final report.

51. An article entitled 'Beer Mergers Start to Pay', by T. A. J. Cockerill, appeared in *The Times*, on 14 May 1970. Mr Cockerill delivered three lectures in the Graduate School of Business of Indiana University, Bloomington, Indiana, U.S.A., in September 1970. The titles were: 'Economies of Scale and the Efficiency of the Brewing Industry in the U.K. and the U.S.A.'; 'Some Problems of British Industrial Structure'; 'The Identification and Regulation of Monopoly in the United Kingdom'.

52. This is a detailed investigation by Mrs K. Bharadwaj into some aspects of production conditions in agriculture in India, employing the information available in the *Studies in the Economics of Farm Management* published by the Government of India. These provide detailed information concerning input utilization (in physical and value terms) and level and composition of output (also in physical and value terms), for different size holdings, for irrigated and non-irrigated crops, for individual crops, and for different regions.

53. The study is divided into two sections. In the first, a detailed study of utilization of inputs has been made according to individual crops and its relation to size of holdings studied. This is done over regions and over different years. Variations in input patterns and crop patterns are studied under different tenancy conditions. Findings concerning labour utilization are discussed in the light of the prevalent notions of 'disguised unemployment' in agriculture. An attempt is made to explain crop-mixes in terms of risk and profitability.

54. In the second section an attempt is made to develop measures of productive efficiency for different size groups of holding in each region in relation to individual crops as well as total output. Inter-regional comparisons are made on the basis of the structural efficiency of farms (meaning the measure of distribution of the productive efficiencies). The notion of 'productive efficiency' is the one used by M. J. Farrell (see his 'The Measurement of Productive Efficiency' in *Journal of the Royal Statistical Society*, 1959). This measure, based on an activity analysis approach, has the advantage of dealing simultaneously with multiple inputs and outputs while avoiding the index number problem. This second part of the project is in progress.

55. Mrs Bharadwaj attended a conference on Capital and Growth Theory at Jerusalem in March 1970.

OPTIMAL PLANNING IN THE U.S.S.R.

56. At the present time the Central Economic Mathematical Institute of the U.S.S.R. Academy of Sciences is working out the theory of an optimally functioning economic system and has put forward concrete proposals for improving the economic mechanism and the methods of economic calculation designed to transform the Soviet economic system into an optimally functioning economic system. The purpose of this project is to explain the significance of this theory and of these proposals. The study is being undertaken by Mr M. J. Ellman in association with Dr C. H. Feinstein.

57. The first year's work proceeded satisfactorily, and it is intended to embody the results of the project in an Occasional Paper, *Soviet planning today: proposals for an optimally functioning economic system*, to be published in 1971.

58. The following paper was published during the period covered by the Report: 'Ispol'zovanie modeli dlya regulirovaniya ekonomiki Velikobritanii' ['The utilization of models for regulating the British economy'] by Michael Ellman (*Modelirovanie ekonomicheskikh protsessov [Modelling economic processes]*, Moscow, 1969).

59. Papers on enterprise incentive funds in the U.S.S.R. were read by Mr Ellman during the year to seminars at the London School of Economics and Political Science and at the Universities of Essex and Glasgow.

THE ROLE OF PRIVATE AND PUBLIC INVESTMENT IN THE ECONOMIC DEVELOPMENT OF DEVELOPING COUNTRIES

60. This project, which is being undertaken by Mr M. P. Ward under the direction of Professor W. B. Reddaway, is concerned with the relationship between business and government capital expenditure and economic growth in developing countries, using the Fiji Islands as a particular case history. The study examines the nature, composition, and geographical location of investment expenditure in Fiji and assesses the relevance of private and public investment to the development of new industries, particularly tourism. It is hoped to stress the need for harmony of capital development expenditures and the methods available to obtain this balance in order to achieve a smoother pattern of economic growth. The results of this research are now being written up and it is planned to publish them in the series of Department of Applied Economics Occasional Papers.

61. Mr Ward returned to Cambridge in December 1969 after a period of two years in Fiji. He went back to Fiji in August and September 1970 on a special assignment to complete a detailed and comprehensive set of national income and balance of payments accounts for Fiji containing a general explanatory and introductory text to national accounting procedures, sources, and methods. This report is being published as an official Legislative Council Paper by the Government Printer in Fiji.

62. An article by Mr Ward, 'Aspects of the Official National Income Tables of Fiji', is to be published shortly in *The Review of Income and Wealth*. In August Mr Ward presented a paper entitled, 'The National Income and Distribution of Income in Fiji', to the Economics Association of Fiji.

(B) INDUSTRIAL RELATIONS AND SOCIOLOGY

MANAGEMENT ORGANIZATION AND INDUSTRIAL RELATIONS

63. The origins and objectives of this enquiry, which is being conducted by Mr D. J. Roberts under Professor H. A. Turner's direction, were outlined in the Eighth and Ninth Reports of the Department. Due to an increasing industrial resistance to postal questionnaires, the research is being conducted by direct interview. Although time-consuming, this method has proved very suitable for providing relevant data, particularly in the supplementary information which is obtained from conversation with industrial managers.

64. Although no firm conclusions have yet emerged, a number of working hypotheses have been obtained, and it is intended to apply these to a wider sample of industrial establishments during the coming year – though certain difficulties arising from the increased spread of industrial unrest have also been recently encountered.

65. Mr Roberts attended the Second World Congress of the International Industrial Relations Association in Geneva, 1–4 September 1970.

JOB EVALUATION

66. This study, which is concerned with the practicability of a national job evaluation system, is referred to in previous Reports. It was undertaken by Mr M. J. Fores and supervised by Professor H. A. Turner.

67. The main work on the study was completed some time ago. Its preliminary results were made available to the National Board for Prices and Incomes and contributed to the Board's own Report on *Job Evaluation*. A paper based partly on the Dutch section of the analysis was also published by Professor Turner and Mr D. A. S. Jackson in the *British Journal of Industrial Relations* in March 1969 ('On the Stability of Wage Differences – and Productivity-Based Wage Policies: an International Analysis'). Completion was then delayed, as noted last year, by delays in arranging visits to Communist countries to study their national wage structures. However, in April of this year, Mr L. J. Handy was able to visit Poland and the Soviet Union to make these enquiries.

LABOUR PROBLEMS IN UNDERDEVELOPED COUNTRIES

68. This study is being undertaken by Mr D. A. S. Jackson under Professor H. A. Turner's direction. Its aims and methods were outlined in the Eighth and Ninth Reports. During the year Mr Jackson visited Turkey in April, India in July, Singapore in August, and Argentina in the second half of September. During August and September Professor Turner and Mr Jackson worked together in Chile, and Professor Turner visited Peru. The broad aim of each of these case studies was to study and analyse the institutional framework of wage settlement, and to acquire data on wage, employment, and related trends.

69. Arising out of the internationally comparative statistical study with which the project commenced, a joint paper entitled 'On the Determination of the General Wage Level – a World Analysis; Or "Unlimited Labour Forever"' is to be published in the *Economic Journal* in December 1971. Two papers based on the case studies by Mr Jackson are being published: 'The Political Economy of Collective Bargaining – the Case of Turkey' in the *British Journal of Industrial Relations*, March 1971, and 'Income Differentials and Unbalanced Planning – the Case of Botswana'.

in the *Journal of Modern African Studies*, December 1970. An econometric study on employment projections in Turkey was made for the State Planning Office in Ankara as a *quid pro quo* for data supplied. (Other papers already published were referred to in the Ninth Report.) Further case studies on wage policy in India and in Argentina have been prepared, and studies on the labour market and inflation in Chile and employment policy in Singapore are under preparation. It is intended to bring the general statistical material and particular case studies together into a book.

LABOUR RELATIONS IN MINING

70. Progress on this project, which has been undertaken by Mr L.J. Handy under the direction of Professor H.A. Turner, has been detailed in earlier reports. In addition to the articles which have already resulted from the project, a book on the history of wages and wage policy in the coal mining industry since nationalization is being prepared for publication. Material on strikes and industrial relations in mining has also been prepared, which will possibly be included in a more general publication including data from other industries. The research also contributed to an article by L.J. Handy and K.J. Wigley ('The Mines: Supply and Demand') in *New Society*, 12 November 1970. In September Mr Handy attended the Second World Congress of the International Industrial Relations Association in Geneva.

CONDITIONS OF EMPLOYMENT OF MANUAL AND NON-MANUAL WORKERS

71. The work on this project has been undertaken by Mrs J.C. Craig directed by Mrs D. Wedderburn. The aims and methods were outlined in the Eighth Report on the Department. Work on the project is now completed, and a final report is being produced.

72. Some of the results of the enquiry were summarized in an article, 'Workplace Inequality' (*New Society*, April 1970), by Mrs D. Wedderburn.

VARIATIONS IN TRADE UNION ORGANIZATION AMONG WHITE-COLLAR WORKERS

73. This project, which began in October 1967, is being undertaken by Dr R.M. Blackburn, Dr K. Prandy, and Mr A. Stewart. All the work referred to in the Eighth and Ninth Reports has now been completed, and analysis of the data is in hand. A report on the first stage of the project is to appear in a forthcoming reader on social stratification and industrial relations. Two articles, one on the measurement of social status, and the other on the method of multi-dimensional unfolding analysis, are also nearly ready for publication. Dr Blackburn gave a paper on 'White Collar Representation' to a Transport Salaried Staffs Association Weekend School.

SOCIAL AND INDUSTRIAL DETERMINANTS OF WORKERS' ATTITUDES

74. 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 came to be in their jobs. It has been designed to separate and assess the relative strength of workers' social backgrounds and their industrial experience in determining their attitudes and behaviour at work. The project, which began in October 1968, is being carried out by Dr R.M. Blackburn and Mr J.M. Mann.

75. The investigation is being carried out in a single labour market, the town of Peterborough. It covers semi-skilled and unskilled workers. The fieldwork has been in two stages. The first was 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 nine firms, including most of the major employers in the area. The second stage, now almost complete, has entailed interviewing about 1,000 workers sampled from these firms. Systematic analysis of these data is now beginning.

WAGE DETERMINATION AND WAGE DRIFT IN THE CONSTRUCTION INDUSTRY

76. This project is concerned with the process and results of wage determination in the construction industry as a major example of certain general problems in wage theory. It is being undertaken by Mr L.J. Handy under the direction of Professor H.A. Turner.

77. A pilot statistical analysis of construction wage movements and their relation to external labour market trends was made in early 1970, and relations have been established with employers' representatives and trade unions in the building and civil engineering sectors. A case study of wage determination on certain building sites has also been made.

COST-BENEFIT RETURNS OF MANPOWER RECRUITMENT SYSTEMS IN THE STEEL INDUSTRY

78. This study is being made by Mr S.F. Wilkinson, a British Steel Corporation Research Fellow who is a visitor to the Department, with advice from Professor H.A. Turner.

79. It is concerned with the effects of the alternative systems of recruitment, promotion, and wage-differentials for process and skilled manual workers in steel plants, and their impact on labour supply and retention in the light of local labour market circumstances. Data have been collected in studies by Mr Wilkinson of the records of several major steel works, and are currently under preliminary analysis.

(C) NEW RESEARCH PROJECTS

80. The following new research projects were planned to begin in 1970-71, the principal investigators being given in brackets:

A Framework for the Analysis and Assessment of Medium Term Policy (Mr W.A.H. Godley).

Factors determining Growth Rates and Growth Potential of Industrially Advanced Countries (Professor N. Kaldor).

Effects of the Regional Employment Premium (Mr W.A.H. Godley).

The Meaning of the National Income Figures (Mr W.A.H. Godley).

Social Status in Great Britain (Dr R.M. Blackburn).

Quantitative Model of the Educational System (Professor J.R.N. Stone).

Some Economic and Social Effects of Migration to and from Great Britain (Mr B.M. Deakin and Dr K. Prandy).

Development of Improved Methods of Teaching Mathematics and Applied Statistics to Economists (Professor D.G. Champenowne).

II. Publications

MONOGRAPH SERIES

81. 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 appeared during 1969-70:

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

Forthcoming titles include:

Abstract of British Historical Statistics. By B.R. MITCHELL and P. DEANE (reprint of original 1962 publication).

Second Abstract of British Historical Statistics. By B.R. MITCHELL and H.G. JONES.

New Commodities, Quality Changes and Consumer Behaviour. By D.S. IRONMONGER.

Studies in British International Monetary Policy 1924-31. By D.E. MOGGRIDGE.

OCCASIONAL PAPERS

82. 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 1969-70 to those listed in previous Reports:

No. 17. *Productivity in Transport: A Study of Employment, Capital, Output, Productivity and Technical Change*. By B.M. DEAKIN and T. SEWARD.

No. 18. *Poverty in Britain and the Reform of Social Security*. By A.B. ATKINSON.

Forthcoming titles include:

Soviet Planning Today. Proposals for an optimally functioning economic system. By MICHAEL ELLMAN.

Private and Public Investment in the Economic Development of Fiji. By M.P. WARD.
The Prediction of Profitability and other Studies of Company Behaviour. By GEOFFREY WHITTINGTON.
International Big Business 1957-1967. A study of Comparative Growth. By ROBERT ROWTHORN in collaboration with STEPHEN HYMER.
Towards Economic Independence. Papers on the Nationalization of the Copper Industry in Zambia. By MICHAEL FABER.
Britain and E.E.C. The Effect of Entry on the Pattern of Manufacturing Production. By S.S. HAN and H.H. LIESNER.

A PROGRAMME FOR GROWTH

83. 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. A ninth volume was published in May 1970:

Exploring 1972 with Special Reference to the Balance of Payments. By TERENCE BARKER and RICHARD LECOMBER.

CAMBRIDGE STUDIES IN SOCIOLOGY

84. 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 following publications appeared in 1969-70:

No. 3. *The Affluent Worker in the Class Structure.* By JOHN H. GOLDTHORPE, DAVID LOCKWOOD, FRANK BECHHOFFER, and JENNIFER PLATT.

No. 4. *Men in Mid-Career: A Study of British Managers and Technical Specialists.* By CYRIL SOFER.

CAMBRIDGE PAPERS IN SOCIOLOGY

85. This series 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 volume in the series, published in 1970, was:

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

REPRINT SERIES

86. 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 titles, which are listed in alphabetical order of authors, have been added:

ARMSTRONG, A.G. and LECOMBER, J.R.C. Statistics for Medium-term Economic Planning (*Journal of the Royal Statistical Society*, Series A, vol. 131, part 1, 1968; Reprint no. 290).

BARKER, T.S. Devaluation and the Rise in U.K. Prices (*Bulletin of the Oxford University Institute of Economics and Statistics*, vol. 30, no. 2, May 1968; Reprint no. 293).

BARKER, T.S. and LECOMBER, J.R.C. The Import Content of Final Expenditures in the United Kingdom 1954-72 (*Bulletin of the Oxford University Institute of Economics and Statistics*, vol. 32, no. 1; Reprint no. 320).

BROWN, A.J. and WOODWARD, V.H. Regional Social Accounts for the United Kingdom (*The Review of Income and Wealth*, series 15, no. 4; Reprint no. 316).

FISHER, M.R. Selection of Skill, Training and Occupational Mobility (*The Manchester School of Economic and Social Studies*, no. 2; Reprint no. 299).

GEORGE, K.D. Productivity in the Distributive Trades (*Bulletin of the Oxford University Institute of Economics and Statistics*, vol. 31, no. 2; Reprint no. 306).

LEICESTER, C.S. Manpower Planning for the National Economy (*Manpower Research*, London, 1969; Reprint no. 304).

MOGGRIDGE, D.E. The Norman Conquest of \$4.86: Britain and the Return to Gold, 1925. (*Annals of International Studies*, Geneva, 1970; Reprint no. 310).

PRYKE, R.W.S. Are Nationalised Industries Becoming more Efficient? (*Moorgate and Wall Street*, Spring 1970; Reprint no. 317).

REDDAWAY, W.B. Was \$4.86 Inevitable in 1925? (*Lloyds Bank Review*, no. 96; Reprint no. 315).

REDDAWAY, W.B. The Selective Employment Tax: A Powerful Incentive (*Accountancy Age*, vol. 1, no. 13; Reprint no. 319).

REVELL, J.R.S. A Secondary Banking System in Britain (*The Banker*, vol. 118, no. 511; Reprint no. 294).

REVELL, J.R.S. Changes in the Social Distribution of Property in Britain during the Twentieth Century (*Actes du Troisième Congrès International d'Histoire Economique*, vol. 1, Munich, 1965; Reprint no. 295).

SILBERSTON, AUBREY. Automobile Use and the Standard of Living in East and West (*Journal of Transport Economics and Policy*, vol. 4, no. 1; Reprint no. 314).

STONE, RICHARD. Foreign Trade and Full Employment (*L'Industria*, no. 4; Reprint no. 313).

WARD, M.P. The Effects of the U.K. Devaluation of Sterling on the Fiji Economy (*The Economic Record*, vol. 45, no. 109; Reprint no. 305).

III. Other Activities

SEMINARS

87. 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.

88. Eleven papers were given in the series of seminars on Mathematical Economics and Econometrics. Visiting economists contributed seven of these.

UNIVERSITY RELATIONSHIPS

89. 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.

RELATIONSHIPS WITH OTHER BODIES

90. 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, H.M. Treasury, the Ministry of Overseas Development, the Department of Employment and Productivity, the Board of Trade, the Ministry of Technology, the Ministry of Public Building and Works, the Social Science Research Council, the National Coal Board, the Bank of England, and a large number of industrial, shipping and business firms, trade and professional associations, and trade unions.

91. The Department gave secretarial and other help to the Second World Congress of the Econometric Society, which was held in Cambridge during September.

VISITORS

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

M. Inoue, Japan Economic Research Center, Tokyo.

A. Kan, University of Melbourne.

A. Mossin, Institute of Economics, University of Copenhagen.

Group-Captain R. Morris, Ministry of Defence.

S.J. Potter, Organization for European Co-operation and Development, Paris.

L.N. Rastogi, National Income Division, Central Statistical Office, New Delhi.

P. Venkatramaiah, Gokhale Institute of Politics and Economics, Poona.

S.F. Wilkinson, British Steel Corporation Research Fellow.

IV. Finance

93. The Department's annual expenditure, which is mainly covered by outside grants, has risen from £114,403 in 1968-69 to £148,564 in 1969-70. 83 per cent. of the expenditure in 1969-70, as against 90 per cent. in 1968-69, was on stipends, wages, and related payments.

94. 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 £45,732 in 1968-69 to £49,752 in 1969-70, an increase of £4,020. Expenditure on the other hand rose by £34,161, thanks to an increased income from outside grants.

95. 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	71,965
Ministry of Technology	48,000
H.M. Treasury	23,000
Central Statistical Office	12,000
Ministry of Overseas Development	2,715
Others	1,533
TOTAL	£159,213

V. Staff

RESEARCH STAFF

96. The research staff employed during the year 1969-70 was as follows: Acting-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: Mrs K. BHARADWAJ, M.A., Ph.D. (Bombay); 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; Mr T.S. BARKER, M.A. (Cantab.), M.A. (Edin.), Fellow of Downing College; Mr T.A.J. COCKERILL, B.A. (Leeds); Mrs J.C. CRAIG, M.A. (Cantab.), B.Sc. (London); Mr E.W. DAVIS, M.A. (St Andrews); Mr M.J. ELLMAN, B.A. (Cantab.), M.Sc. (Econ.) (London); Mr S.S. HAN, D.Phil. (York), B.A. (Yonsei); Mr L.J. HANDY, M.A. (Cantab.), B.A. (Leeds); Mr O.T. HOOKER, M.A. (Cantab.); Mr D.A.S. JACKSON, B.A., B.Phil. (Oxon.); Mr C.S. LEICESTER, M.A. (Cantab.); Mrs T. LIESNER, M.A. (Cantab.), B.Sc. (Econ.) (London), Fellow of Girton College; Mr J.M. MANN, B.A. (Oxon.); 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, M.A. (Cantab.), B.A. (Bristol), Fellow of Trinity Hall; Mr J. RHODES, B.A. (Liverpool); Mr A.R. ROE, M.Sc. (Wales), B.Comm. (Leeds); Mr A. STEWART, B.Sc. (Econ.) (London); Mr J.D. SUGDEN, B.A. (Newcastle); Mr C.T. TAYLOR, B.A. (Cantab.), M.A. (McGill), Fellow of University College; 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., Ph.D. (Cantab.), Fellow of Corpus Christi College; Mr V.H. WOODWARD, B.A. (Nottingham).

Junior Research Officers: Mr P.M. CROXFORD, B.A. (Exeter); Mr A.S. DEATON, B.A. (Cantab.); Mr C.H. FLETCHER, B.A. (Exeter); Mr D.A. LIVESEY, B.Sc. (Eng.) (London); Mr J.S.O' DONNELL, B.A. (Cantab.); Mr D.J. ROBERTS, B.A. (Cantab.); Mr B. SHEAREY, M.Sc. (Leeds); Mr T.S. WARD, B.A. (Swansea).

Research Consultants: Mr A.H.M. FELS, B.Econ., LL.B. (Western Australia); Mr D.R. GLYNN, M.A. (Oxon.); Mr M.A. KING, B.A. (Cantab.); Mr J.P. MOYLE, B.Sc. (Manchester), F.R.I.C.S.; Mr F.E. TOWNSON; Mrs J.M. WHEELER, B.Sc. (London), Ph.D. (Cantab.).

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

Faculty Teaching Officers and holders of University posts:

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.
Mr D.G. CHAMPERNOWNE, M.A. (Cantab.), Fellow of Trinity College, Reader 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 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 D.E. WEDDERBURN, M.A. (Cantab.), Lecturer at the Imperial College of Science and Technology, University of London.

98. 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 A.G. ARMSTRONG, B.A. (Cantab.) (Lecturer in Economics at University of Bristol).
Mr M.J. GREEN, M.A. (Cantab.), B.A. (Oxon.) (Statistician, Central Statistical Office).
Mr O.T. HOOKER, M.A. (Cantab.) (Senior Economic Adviser to the Welsh Office).
Mr J.R.C. LECOMBER, M.A. (Cantab.), B.A. (Oxon.) (Lecturer in Economics at University of Bristol).
Mr D.E. MOGGRIDGE, M.A., Ph.D. (Cantab.), B.A. (Toronto), Research Fellow of Clare College (Editing Keynes papers for the Royal Economic Society).

ASSISTANT STAFF

99. The following is a list of the assistant staff at September 1970:

Secretary: Mr H. LOSHAK.

Administrative Officer: Mr R.C. LAWRENCE.

Librarian: Mrs O.E. PEPPERCORN.

Secretarial and Clerical Staff: Mrs L.E.SILK (Head of typing pool); Mrs C.A.BAYFIELD; Miss T.J.BROWN; Miss M.R.CORNELL; Miss T.GURNER; Miss C.A.HUDSON; Mrs J.M.LEVERETT; Miss B.A.MOORE; Miss L.M.NEWMAN; Miss P.RAYMENT; Mrs D.M.ROBERTS; Miss A.C.TWYMAN; Miss M.J.WEAVER.

Computing and Statistical Staff: Miss M.R.CLARKE (Senior Computer); Mrs R.COE (Senior Data-processing assistant); Mrs E.C.BARKLEM; Mrs M.J.BARNETT; Mr E.D.BOUGOURD; Miss M.V.CLARK; Miss B.V.COOK; Mrs D.M.DANCER; Miss D.M.DAY; Mrs P.A.FAIRCLOTH; Mrs P.A.POLLITT; Miss S.D.SEAL; Mr R.M.SMITH; Miss B.TAYLOR.

DIRECTORSHIP

100. Professor W.B.Reddaway continued as Acting-Director until 30 September 1970. Mr W.A.H.Godley entered upon the Directorship on 1 October 1970.