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DEPARTMENT OF
APPLIED ECONOMICS

FOURTH REPORT
ACTIVITIES IN THE YEARS
1954-57



February 1958

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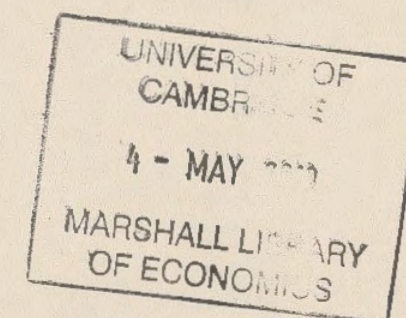
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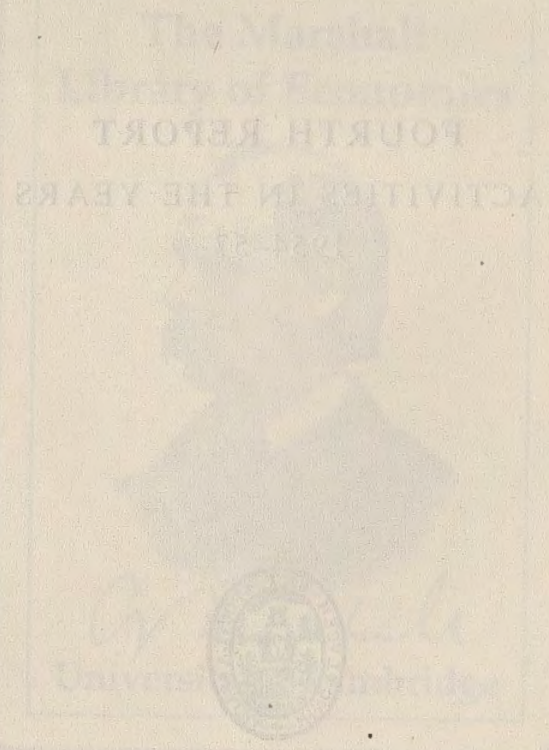
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UNIVERSITY OF CAMBRIDGE DEPARTMENT OF APPLIED ECONOMICS

Director

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Assistant Director

J. E. G. UTTING

Committee of Management, December 1957

E. A. G. ROBINSON (*Chairman*)

N. KALDOR

W. B. REDDAWAY

R. L. MARRIS

A. D. ROY

A. R. PREST

A. SILBERSTON

R. STONE

Mr S. R. DENNISON, Professor H. G. JOHNSON, Professor Sir DENNIS ROBERTSON and the late Dr J. WISHART were also members of the Committee of Management during the period covered in this Report. Mr R. M. D. DAVIES acts as Secretary of the Committee.

FOURTH REPORT OF THE DEPARTMENT OF APPLIED ECONOMICS

(covering the period July 1954 to December 1957)

I. GENERAL

1. During the four years covered by this Report major changes and developments have taken place affecting the Department. First, there has been a change in the Directorship. Secondly, the General Board of the Faculties has reviewed the work of the Department during the first ten years of its existence, and proposals affecting its size, staff, accommodation, and finance have been approved by the University and brought into effect. Arising from this, the Department has been provided with premises at 7 West Road large enough to accommodate its entire staff. Finally, several major research inquiries have been successfully completed, while others are in their final stages, and twelve new projects have been started.

2. The effect of these developments, which are referred to in detail below, has been to confirm the role of the Department as a research institute within the Faculty of Economics and Politics, and to widen the scope of its research activities.

The Directorship

3. In July 1955 Mr Richard Stone resigned as Director of the Department on being appointed P.D. Leake Professor of Finance and Accounting, and was succeeded by Mr W.B. Reddaway, M.A., Fellow of Clare College.

4. Mr Stone had directed the Department's research during the first decade and was mainly responsible for establishing its reputation for econometrics, the analysis of market demand, and national accounts studies. As Leake Professor, he continues to be closely associated with the work of the Department.

The General Board's Report on the Department

5. During 1954-55 representations were made to the General Board to provide the Department with a single building large enough to accommodate all its staff and activities, including the research activities of the Faculty's Industrial Research Group. Since these proposals involved questions of principle, the General Board undertook an examination of the work and needs of the Department and, in March 1956, reported to the University on the need for the Department, its relationship to the Faculty, its size, the accommodation needed for it, and the extent to which its finance might reasonably come from University or from outside funds. (See *Cambridge University Reporter*, vol. LXXXVI, no. 3985, pp. 989-99.) The General Board's main conclusions and recommendations, which were approved by the University in May 1956 and have since been put into effect, are summarized in the following paragraphs.

6. The General Board were satisfied that the work of the Department had brought credit to the Faculty and that a clear case had been established for its continued existence at about the size it had reached in 1955-56, including the Faculty's Industrial Research Group. It was felt that there should be room in the Department for all the applied economic activities of the Faculty, both those which might be described as the direct interests of the Director and Committee of Management and also those more directly the interest of other members of the Faculty. In particular, the General Board welcomed the proposal to provide accommodation and administrative and ancillary services within the Department for the P.D. Leake Professor and his research staff and to absorb the Industrial Research Group into the Department.

7. Being satisfied on the need for the Department, the General Board agreed that University posts should be established for its graduate research staff entitling them to certain privileges such as family allowances, and recommended the establishment of twenty-five such posts, the actual number to be filled at any time being fixed within this limit in accordance with the needs of current work and within the current availability of funds.

8. It was recommended that one of the new posts should be for an Assistant Director of the Department, whose duties would be in part to engage in research under the general supervision of

the Director and in part to assist the Director in the general duties of the administration of the Department. Following the acceptance of the General Board's recommendations by the University, Mr J.E.G. Utting, M.A., was appointed Assistant Director from 1 April 1956.

9. The General Board were satisfied on the need to end the arrangement, which had continued since 1951, whereby applied economic research within the Faculty was divided between two buildings some considerable distance apart, and recommended that an extension should be built onto the house at 7 West Road already occupied by the Department, so as to accommodate the whole staff of the Department as well as providing for the associated research activities of the Faculty. (A description of the Department's existing accommodation is given in Section VI of this Report.)

10. The General Board recommended that the Department should be established at about its 1955-56 size in staff, buildings, and finance, and that the grant to the Department from the University should accordingly be stabilized at about its 1955-56 level until the end of the quinquennium 1957-62 except to any extent that the Faculty Board might ask for funds to be diverted from their own grant to that of the Department, or that the General Board might themselves wish to recommend an increase in consequence of proposals for a general increase of stipends or wages in the University. The effect of this recommendation is referred to in the following section of this Report.

II. FINANCE

11. About two-thirds of the cost of the Department's research (of which four-fifths is in respect of stipends and wages) is covered by an annual grant from the University, while about one-third is financed by grants from outside bodies in aid of specific research projects.

12. As has been mentioned in the previous section (paragraph 10), the University decided in 1956 to stabilize its grant to the Department at about the level reached in 1955-56, until the end of the quinquennium 1957-62, so that the financial position of the Department consequently differs from that of other University Departments which submit annual estimates on which grants from the University are based. A further difference is that, in proposing research appointments, the Department must be able to show that sufficient funds are at its disposal, including the fixed grant from the University, to cover all its commitments for the whole period of the appointments. In order that the general level of research activity should be maintained, it is therefore essential for the Department to have the support of outside bodies for several of its research projects, while the existence of a reserve fund is necessary to absorb year to year fluctuations in outside finance.

13. Fortunately, the Department has received very generous support from a number of outside bodies which have provided the finance for six major research projects described in the following section. The remainder of this section records the financial assistance which the Department has received during the period under review.

14. In 1951 the Rockefeller Foundation made a grant of £19,500, and the Nuffield Foundation a grant of £6500, to enable the Department to undertake during 1952-55 an inquiry into the social accounts of Cambridgeshire. Early in 1955 it became clear that the cost of the whole inquiry would exceed the figure estimated in 1951, and the two Foundations agreed to make a further joint grant of £4000 to enable the work to be completed. The Rockefeller and Nuffield Foundations have therefore together granted a total of £30,000 to meet the cost of this inquiry.

15. A further grant of £11,763 was made by the Rockefeller Foundation in 1957, to enable Professor Stone and his research unit to undertake a study of the problems and uses of input-output tabulation and model building. This work, which will extend over three years, was commenced in August 1957.

16. In July 1957 the Nuffield Foundation agreed to grant up to £3000 to enable the Department to undertake a pilot investigation into the economic circumstances of old people. The pilot study is being undertaken during 1957-58 and it is hoped that the results will justify a major investigation on a national basis.

17. The work which has been undertaken at the Department during the academical years 1953/4 to 1956/7, with the object of constructing an interindustry input-output table for the United Kingdom in 1948, was financed entirely out of Counterpart Funds derived from United

States economic aid, a grant of £9823 being made by the Board of Trade. In addition the five projects undertaken by the Industrial Research Group of the Faculty were wholly financed from Counterpart Funds.

18. In 1953 the Social Science Research Council of America agreed to finance work in the Department on long-term economic growth in the United Kingdom. This work has continued through the years 1954-57 and will be completed by September 1958. The total cost of the inquiry, which is being met by the Social Science Research Council, will amount to £13,500.

19. The Ford Foundation agreed, early in 1957, to make the Department a grant of 38,000 dollars to cover the cost of a three-year study of the dynamics of demand, to be undertaken by Professor Stone and members of his research unit. Work on this inquiry began in January 1957.

20. In addition to financial support for projects included in the Department's research programme, grants have also been received from the National Institute of Economic and Social Research and the London and Cambridge Economic Service to cover the cost of research facilities and assistance made available to these bodies.

III. RESEARCH ACTIVITIES

21. In recent years there has been a slight shift in the Department's programme (as described in the Third Report) to include more research into the actual structure and working of the economy. This shift has been reinforced by the recent complete incorporation into the Department of the work previously conducted by the Industrial Research Group. Examples of this are an inquiry into the practice of firms in placing forward orders for their products, an examination of the factors influencing integration in British industry, and a survey of the sources of finance of small public companies. Other examples could be given. Although these projects will yield valuable information of use in testing economic hypotheses, their primary object is to understand the actual working of facets of the British economy.

22. During the years 1954-57 several major projects referred to in the Fourth Report have been brought to a successful conclusion, while a dozen new projects have been started. In the paragraphs which follow these inquiries are described under the three heads:

- (a) The collection of data.
- (b) Applied economic analysis.
- (c) Statistical and computational studies.

(a) The Collection of Data

Regional Social Accounts

23. This inquiry was undertaken by Miss P.M. Deane and Mr E.B. Butler with the aim of devising a system of social accounts suitable for regional economic analysis. The method used was wherever possible to break down official United Kingdom estimates into regional components, but in the case of wages and salaries, agriculture, and the local authority accounts, special inquiries had to be undertaken, mainly on the basis of unpublished material. The main work of estimating regional income was completed in 1954, and a final draft of the report was subsequently completed and is now awaiting publication.

Interindustry Relationships in the United Kingdom, 1948

24. The aim of this study has been to construct for the United Kingdom an input-output table for 1948 on a scale comparable to that produced for the U.S.A. by the Bureau of Labor Statistics, and to develop the theory of input-output analysis. In this work the Department has had the active co-operation of the Board of Trade and other government departments. During 1955-56 a team at the Board of Trade, headed by Mr A. Blackwell of the Statistics Division, provided detailed tabulations of the input and output of sectors of the economy covered by the 1948 Census of Production. This mass of data, together with additional information for other sectors obtained by the Department's staff, has been used to construct a large interindustry table which provides a statistical picture of industrial interdependence in 1948 from which input coefficients can be derived. These coefficients will permit a fuller treatment of structural changes in British industry since the war than has hitherto been possible.

25. The main results of the study are complete and awaiting publication in the Department's monograph series. Certain aspects of the inquiry are dealt with in an article by Mr A.A. Adams and Mr I.G. Stewart (Reprint No. 124) and in an article by Mr F.E.A. Briggs (Reprint No. 136). The Department is indebted to the Department of Scientific and Industrial Research for enabling Dr T.E. Easterfield to work in Cambridge on the theoretical aspects of the inquiry during 1955.

The Social Accounts of Cambridgeshire

26. In this project an attempt has been made to construct a system of social accounts for the county of Cambridgeshire in the year 1953-54, based mainly on the direct collection of information and the use of sampling methods. Work on the inquiry began in the latter part of 1951 and the collection of information was not completed until the end of 1956. Delays in the collection of information from manufacturing and retail enterprises, and in the tabulation of the results of the household survey, held up the final assembly of the material in social accounting form, but the results are now being written up and it is hoped that a report will shortly be ready for publication in the monograph series.

27. The collection of information on the income, saving and expenditure of households was completed early in 1954, and some of the principal results are given in Reprint Nos. 116 and 127, in a paper by Mr J.E.G. Utting and Mrs D.E. Cole on 'The Distribution of Household and Individual Income' (published in *Income and Wealth*, Series vi), and in a paper on 'The Income, Expenditure and Saving of Old People Households in Cambridgeshire' which Mrs Cole read at the International Congress of Gerontology in 1957. A report by Mr W.J.K. Thomas entitled 'A Financial Survey of Cambridgeshire Smallholdings, 1953-54' has appeared in the *County Farmers' Journal*, and a statistical analysis by Mr F.G. Forsyth of data from the 1952-53 farm survey has also been published (Reprint No. 134).

International Comparisons of Real Product

28. During 1953 a pilot study was undertaken to compare the gross national product of the United States and the United Kingdom by industry of origin. Subsequently it was found that the Organization for European Economic Co-operation were planning to extend their work on international comparisons by similar methods, and, at the end of 1953, the two projects were combined, the work at the Department being undertaken by Miss D.C. Paige and at O.E.E.C. by Dr G. Bombach under the direction of Mr Milton Gilbert. A joint paper by Mr Gilbert, Dr Bombach and Miss Paige, giving the preliminary results, was presented to the fourth conference of the International Association for Research in Income and Wealth in 1955, and a full report is now awaiting publication by O.E.E.C. The results show that the work has provided a valuable check on the comparison of real products previously done by the expenditure method.

Domestic Capital Formation in the United Kingdom, 1920-38

29. Work on this inquiry has been proceeding since the latter part of 1950 and is now nearly complete. Since the last Report samples have been collected for particular trades in manufacturing and distribution, on the basis of which capital formation in those sectors is being estimated. It is hoped that the final results will be ready for publication in 1958 in the series of Studies in the National Income and Expenditure of the United Kingdom. Dr K. Maywald, who is in charge of the inquiry, was assisted by Mr J.J.H. McGibbon until November 1956, when the latter left to join O.E.E.C.

Long-Term Economic Growth in the United Kingdom

30. The object of this inquiry is to trace the course of economic growth in the United Kingdom over as long a period as the quantitative evidence will permit. It is focused on the development through time of the principal national aggregates (such as national income, product, expenditure and investment), and is concerned with the ways in which rates of economic growth, measured in terms of these aggregates, are related to growth of population or particular industries, to the weight and character of government activity or of international trade, and to the distribution of incomes and standards of living within the community. Two members of the Department's research staff have been engaged on this inquiry. Miss P.M. Deane started work on it in 1954 and Dr W.A. Cole in 1955.

31. A study of the evidence of contemporary national income estimates, beginning with Gregory King's 1688-95 estimates and ending with Giffin's estimates at the turn of the twentieth century, is largely complete. Work is now in progress on a detailed analysis of international trade records for the eighteenth century and related price records, and on the long-term growth of particular industries from pre-industrial times.

32. It is planned to publish the main results of the inquiry in the Department's monograph series. As a by product of the study, it is hoped to publish an Abstract of Historical Statistics continuing the original series together with annotations on their content and usefulness as economic data. Four papers by Miss Deane arising out of the inquiry have been published (Reprint Nos. 109, 119, 128, and 133), and an article by Dr Cole on 'Trends in Eighteenth Century Smuggling' is to be published in the *Economic History Review*. A further paper by Dr Cole on 'The Chronology of Industrial Growth in Eighteenth Century Britain' has been circulated as a mimeograph.

Forward Business Orders

33. This inquiry, which was begun towards the end of 1956, is concerned with the economic implications of the booking of forward orders by manufacturers and the placing of forward orders by distributors. The purpose of the inquiry is to obtain information on normal business practices in this respect in a number of industries, and to examine the role of orders (and, to some extent, stocks) in the process of economic fluctuation. A pilot study is being undertaken covering orders booked or placed by firms dealing in textiles and clothing and in durable goods, such as radios, furniture and electrical equipment. The work is being undertaken by Dr M. Wray and Mr T.A.B. Corley. Mr I.G. Stewart worked on the inquiry until September 1956, when he left to take up an appointment at Edinburgh University.

Integration in British Industry

34. The purpose of this inquiry, which is being undertaken by Dr P.L. Cook, is to study the structure of selected British industries and the reasons why changes in their structure have taken place or may do so in the future. With this object, it is hoped to obtain as accurate a picture as possible of the present and past structure of each industry by studying the history of the industry from the point of view of structural change. A relatively small number of industries will be studied, but it is hoped that comparisons between them will permit limited generalizations about the sets of factors which lead to different types of integration. Work on the inquiry began in 1957 with an examination of the salt industry.

The Economic Circumstances of Old People

35. The main purpose of this inquiry is to provide a detailed picture of the economic circumstances of people over retirement age in Britain at the present time. Information is being sought about the income, expenditure and savings of the aged, but in order to interpret the financial data a number of socio-economic factors are also being investigated. The material collected will, in addition to its main purpose, also provide data for a further investigation of the life cycle of income and expenditure, and for a study of the methodology of financial surveys.

36. A pilot survey in Greenwich and Bedford and its surrounding area was started in November 1957 and it is hoped to obtain a sample of 200-250 households containing old people. If this pilot survey proves successful it is planned to carry out an investigation on a national scale during the course of 1958-59. The work is in charge of Mr J.E.G. Utting and Mrs D.E. Cole assisted by Miss S. Meadows.

A Study of National Capital

37. The aim of this study is to obtain an overall picture of national wealth, with particular emphasis on the relationship between the constituent parts. It is hoped, for example, to show the distribution between industries of real physical assets, valued in different ways, and the distribution between sectors of the economy of the ownership of real and financial assets. In addition to tables analysing the figures obtained, it is proposed to summarize the results in a set of balance sheets for each sector of the economy which can be integrated with the information in the official national income and expenditure accounts. The work, which is being undertaken by Mr J.R.S. Revell, began in 1957.

The Finance of Small Public Companies

38. In October 1957, Mr H.S. Dickinson began an investigation into the sources and uses of the funds of small companies below the size of quoted public companies. This study is intended to supplement a similar inquiry undertaken by Mr Dickinson at the National Institute of Economic and Social Research into the finance of quoted companies.

Quarterly Product and Expenditure Estimates

39. During 1955-56 a new series of quarterly product and expenditure estimates was developed with the object of providing a quarterly series comparable with the official annual estimates, and as far as possible the same indicators are used. Work on this series, which is published in the *London and Cambridge Economic Bulletin*, was started by the late Mr A.A. Adams and has been continued by Miss D.C. Paige.

(b) Applied Economic Analysis

Factors determining Stock Exchange Prices

40. The aim of this inquiry is to identify and estimate the quantitative influence of the factors which determine Stock Exchange prices, and to examine their relevance to the future experience of companies. The research completed so far has attempted to explain variations in prices between companies by corresponding variations in other variables such as dividends, undistributed profits, the growth in dividends and the value of net assets per share. Work on a pilot study of the electrical goods industry was begun by Mr G.R. Fisher in April 1955, and for three months during the summer of 1956 he was joined by Mr S.F. Kaliski, who undertook an analysis of the brewery industry. In October 1956 Mr T.A.B. Corley joined the inquiry for a year, working on the wool textile industry.

41. Papers by Mr Fisher arising out of the inquiry are: 'An Econometric Approach to the Analysis of Stock Exchange Prices' (read at the European meeting of the Econometric Society in 1957), and 'Maximum Likelihood Estimators with Heteroscedastic Errors'.

Capital, Employment and Output

42. This project was begun in October 1956 with the object, in the first place, of obtaining a satisfactory measure of changes in industrial efficiency which takes account of changes in the quantity of both labour and capital. The method adopted is to find the rise in output at 1948 prices, first in the case of industry groups and later industries, and to attempt to discover how much would be needed to remunerate extra labour and extra capital, and how much represents net technological progress. Provisional figures have been obtained for industry groups and the procedure is being applied to about thirty specific trades. Explanations for the varying rates of progress in different industries will be sought, and the varying proportions in which the fruits of progress are divided between the consumer, the workers and the providers of capital will be studied. The work is being undertaken by Miss M.C. Vidakovic and Mr A.D. Smith under the supervision of the Director.

A Study of the Coal Industry

43. The National Coal Board possesses a wealth of information about individual pits, and it is hoped to analyse some of this information so as to throw light on the structure of the coal industry and the characteristics of production in it. In particular, it is hoped to be able to apply the methods described by Mr M.J. Farrell in his paper to the Royal Statistical Society on 'The Measurement of Productive Efficiency' (Reprint No. 135). The inquiry is being undertaken by Mr Farrell with the assistance of Mr F.G. Forsyth and Dr L.J. Slater.

The Dynamics of Demand

44. This project is being undertaken by Mr J.A.C. Brown and Mr J.S. Cramer under the direction of Professor Stone. The aim is to develop a theory of consumers' behaviour which takes into account the past and expected future income and composition of the individual household, and the accumulation and decumulation of durable goods and other assets during its normal life cycle. It is hoped to advance the statistical analysis of consumers' demand to a stage where it will

be possible to solve the methodological problems which arise when previous purchases exert a significant influence on consumers' behaviour, either in terms of accumulated stocks or acquired habits. The inquiry will involve the retabulation of recent household survey material, notably the savings data obtained by the Oxford Institute of Statistics.

Input-Output Tabulation and Model Building

45. This investigation, which is being undertaken by Dr A. Ghosh and Miss D.C. Paige under the direction of Professor Stone, is part of a long-term programme of research of which the first stage, now completed, was the construction of an input-output table for the United Kingdom in 1948. The aim of the present inquiry is to find out how best to use the input-output information available, what supplementary data are important and to test expectations in these matters by putting the table to work. It is hoped that the study will throw light on how far input-output projections are reliable, and how far increased accuracy can be achieved by building models which do not assume that all inputs are proportional to the outputs into which they enter. Work on the inquiry began in August 1957 and will extend over three years.

The Determinants of British Exports

46. The aim of this inquiry is to estimate the influence on the volume of British exports of such variables as the prices of the goods being exported, competitive prices, and the volume of world trade. Although it is hoped to throw light on the present position with regard to various commodities, attention is being concentrated in the first instance on the behaviour of aggregates in the interwar period. The work is being undertaken by Mr S.F. Kaliski and began in October 1957.

The Analysis of Family Budgets

47. Further work on the analysis of family budgets is being undertaken by Mr F.G. Forsyth with the object of comparing the results of the post-war inquiry by the Ministry of Labour with that conducted by the Ministry in 1938. It is hoped to extend the analysis of the consumption patterns of different household types, using equivalent adult scales.

The Depreciation of Motor-Cars

48. Work has been undertaken by Mr J.S. Cramer with the object of constructing a statistical model which will describe the depreciation of motor-cars or durable goods in general. In the model a car is treated as a collection of indivisible components, each subject to the risk of loss or breakdown, and on this basis a series of frequency distributions are generated which describe the composition of the car population of any given age in terms of the number of components which they retain. This model has been applied with satisfactory results to the pre-war secondhand prices of forty different makes of car in the United Kingdom. A paper by Mr Cramer on this subject has been read to the Royal Statistical Society.

(c) Statistical and Computational Studies

The Lognormal Distribution

49. This work, undertaken by Mr J. Aitchison and Mr J.A.C. Brown, was successfully completed in 1956, and a volume in the Department's monograph series dealing with the statistical properties of the lognormal distribution, especially in relation to economic problems, was published by Cambridge University Press in 1957.

Computational Methods

50. Dr L.J. Slater was appointed in October 1956 to take charge of Department work on the automatic electronic computer in the Mathematical Laboratory of the University. In addition to specific assistance to the work on demand analysis, the study of the coal industry, and the analysis of family budgets, Dr Slater has constructed computing programmes intended for general use within the field of applied economics. The most important of these is a general programme for the estimation of multiple regression systems.

IV. OTHER ACTIVITIES

Seminars

51. The Department has continued to hold periodical seminars in applied economics conducted either by its own members or by others closely associated with its work, and by a number of distinguished visitors. Fifty research papers have been read at seminars during the years under review, of which sixteen have been contributed by visiting economists.

University Relationships

52. An important feature of the years 1954-57 has been the closer integration of the Department with the Faculty of Economics and Politics. The new relationship was reflected in the view, expressed by the General Board in its report, that the Department might be considered the laboratory of the Faculty, and in the provision that the Department should accommodate all the applied economic research of the Faculty and that holders of University posts in the Department should become members of the Faculty.

53. Previously the Department was virtually a separate unit within the Faculty. Although its research activities were under the general control of a committee appointed by the Faculty Board, members of the Faculty did not to any great extent participate in its programme of research. Assistance given by the Department to members of the Faculty was mainly limited to computational and secretarial services, and some occasional research assistance.

54. Towards the end of 1953 the Faculty set up an Industrial Research Group, with its own research and assistant staff, to undertake research into five projects for which finance had been made available out of Conditional Aid funds. Each of these projects was under the direction of a senior member of the Faculty, and was concerned with current economic problems of interest in policy formation. During the academical years 1953/4 to 1955/6 the Industrial Research Group shared accommodation with the Department, which provided computational and other assistance to the Group. In considering the role and needs of the Department, the General Board agreed that the Industrial Research Group had met temporarily a continuing need of teaching officers of the Faculty to engage in organized research, and proposed that provision should be made for the continuation of such work within the Department.

55. The Department accordingly invites teaching members of the Faculty each year to initiate and participate in research projects. In addition to the two projects for which the P.D. Leake Professor of Finance and Accounting is responsible, three of the inquiries in the Department's current research programme are directed by teaching officers of the Faculty.

56. The research activities of the P.D. Leake Professor constitute a special and important part of the provision for Faculty research within the Department. The Committee of Management of the Department has agreed to provide working accommodation for the P.D. Leake Professor and his research staff up to six in number, together with ancillary computers and clerical staff, and Professor Stone is at present responsible for two research projects both of which are financed from outside the University.

57. In addition, working accommodation is, as far as possible, made available to members of the Faculty who are not directly associated with the Department's research activities, such as the Faculty's Assistant in Research, Mr J. Longden, and lecturers who do not have rooms in a College.

Relationships with Other Bodies

58. The Department has maintained very close relationships with the National Institute of Economic and Social Research. Two of the research projects described in this Report form part of the joint programme of research into the national income and expenditure of the United Kingdom. These are Miss Deane's work on the regional social accounts of the U.K., and Dr Maywald's study of capital formation. It is intended that the results of these two inquiries should appear in the Joint Series published by Cambridge University Press on behalf of both bodies.

59. During the academical years 1954/5 to 1956/7, one of the National Institute's own research projects was located at the Department, namely the study of economic developments in the United Kingdom 1945-54, and accommodation was provided for Mr J.C.R. Dow, Mr M.F. Scott and an assistant.

60. The Department also maintains close relationships with the Oxford Institute of Statistics. Research workers from each organization have visited the other to discuss matters of mutual interest arising out of their projects, and Mr Reddaway gave a seminar at the Oxford Institute on the preliminary results of the investigation of Stock Exchange prices.

61. The Department has continued to receive valuable co-operation from a number of government departments, particularly the Central Statistical Office, the Board of Trade and the Department of Scientific and Industrial Research. The Department is indebted to the Ministry of Agriculture and Fisheries, the Ministry of Housing and Local Government and the Ministry of Labour for information and advice in connexion with the study of regional accounts, and to the Board of Inland Revenue for information in connexion with the study of capital formation. Ready co-operation was received in connexion with the Social Accounts of Cambridgeshire inquiry from the Ministry of Labour, the Board of Trade, the Ministry of Agriculture and Fisheries and the Cambridgeshire County Planning Department, as well as from innumerable firms and households.

62. Secretarial and computing assistance has continued to be provided for the London and Cambridge Economic Service in connexion with the publication of its quarterly *Bulletin*, which is edited by Mr Reddaway. Until his death in August 1956, Mr A. A. Adams was the statistician to the Service. This position is now held by another member of the Department's research staff, Miss D. C. Paige, who is responsible for the series of quarterly product and expenditure estimates.

63. Since mid-1957 the Department has undertaken responsibility for the business side of the *Review of Economic Studies*, principally subscriptions and circulation.

64. Reference is made in Section II of this Report to the valuable support which the Department receives from a number of outside bodies and learned institutions.

International Conferences

65. The Department has kept in touch with economic research abroad by attendances at international conferences and by affording facilities to foreign scholars to work for a time in Cambridge.

66. In 1954 Mr Stone attended an international seminar on input-output analysis, held at Varenna, Italy, and the World Population Conference at Rome, and presented papers at both conferences. In the same year, and again in 1955, he delivered a series of lectures at the University of Copenhagen.

67. In March 1955 Mr Stone visited Yugoslavia at the invitation of U.N.E.S.C.O. and lectured on social accounting, input-output and demand analysis, and in June of the same year he attended a conference of European statisticians at Geneva.

68. In September 1955 Miss Deane, Miss Paige and Professor Stone attended the European meeting of the Econometric Society at Kiel. Several members of the Department also attended the 1955 conference of the International Association for Research in Income and Wealth, held at Hindsgavl, Denmark, contributing three papers.

69. Towards the end of 1955, Professor Stone and Mr Adams attended a conference of economic statisticians at Paris, arranged by O.E.E.C. for the purpose of discussing a report on price and quantity index numbers in social accounting written by Professor Stone.

70. A conference on economic and social research in West Africa, held at Achimota University, Accra, in 1955, was attended by Miss Deane.

71. In March 1956 Professor Stone visited Turkey under the auspices of the British Council and delivered a course of lectures on social accounting and model building. In the same month, Mr Reddaway lectured at the Norges Handelshyskole, Bergen.

72. In June and July 1956, Mr Reddaway visited Poland at the invitation of the Polish Economic Society and took part in discussions with Polish economists and statisticians.

73. Miss Deane spent the last quarter of 1956 in the United States in connexion with her research into economic growth, visiting the Johns Hopkins University and the Universities of Columbia and Chicago.

74. In June 1957 Mr Brown presided over a consultation of European demand analysts held in Geneva under the auspices of the Food and Agriculture Organization.

75. In July 1957 Mr Utting and Mrs Cole attended the International Congress of Gerontology, held at Merano, Italy.

76. The European meeting of the Econometric Society, held at Luxembourg in August 1957, was attended by Mr Cramer and Mr Fisher, the latter presenting a paper.

77. Miss Deane and Dr Maywald attended the conference of the International Association for Research in Income and Wealth, held in Holland in August 1957.

78. During July and August 1957, Mr Reddaway took part in conferences at the Merrill Center for Economics, New York.

Visitors from Abroad

79. A number of distinguished economists from abroad have worked in the Department as visiting members during 1954-57, while others have been welcomed on shorter visits. Among visitors to the Department have been the following:

1954-55

Professor C.F. Christ, while on leave from the Johns Hopkins University.

Professor J.S. Duesenberry of Harvard University.

Professor V.E. Smith of Michigan State College.

Mr D.H. Brill of the U.S. Federal Reserve System.

Dr Thea Gelsomini of Milan University.

Mr P. Bredsdorff of the Danish National Institute of Building Research.

Mr M. Kawakami and Mr B. Matsumura of the national income section of the Economic Counsel Board, Japan.

1955-56

Professor R.H. Strotz of Northwestern University.

Miss M.C. Burk of the U.S. Department of Agriculture.

Miss C.O'Loughlin of the Australian National University.

Mr P. Munthe of the Norges Handelshyskole, Bergen.

Mr L. Stetting of the University of Copenhagen.

Mr A. Haggag of the Finance Department of the Government of Kuwait.

Mr P. Ripoche of the Secretariat-General, Rabat, Morocco.

Mr M. Hassan, Principal of the Hailey College of Commerce, Lahore, Pakistan.

Mr K.M. Dallas of the University of Tasmania.

Professor Lloyd G. Reynolds of the Ford Foundation.

Dr P. Mihajlovic of the Yugoslav Foreign Trade Institute.

Dr Oskar Lange, Rector of Warsaw University.

1956-57

Professor Murray Kemp of McGill University.

Mr T. Marschak of Stanford University.

Dr F. Pokorn of the University of Ljubljana, Yugoslavia.

Professor G. Heberton Evans of the Johns Hopkins University.

Professor E. Cary Brown of the Massachusetts Institute of Technology.

Professor H.J. Witteveen of the University of Rotterdam.

Professor Seymour Melman of Columbia University.

Mr B. Anthracopoulos of the National Bank of Greece.

80. The Department has also received visits from parties of foreign economists and statisticians. In December 1955, a delegation of members of the French Economic Council was received at the Department, and in May 1956 a party of foreign statisticians visited the Department to discuss methods of social statistics. In March 1957, the Department welcomed a party of Polish economists led by Professor E. Lipinski, President of the Polish Economic Society, who were visiting Cambridge for discussions with Cambridge economists.

81. During the Michaelmas Term 1957, working accommodation has been provided at the Department for Professor William Fellner of Yale University, Mr K.L. Kinsman of the Bureau of Agricultural Economics, Canberra, and Mr S. Long of Northwestern University.

V. PUBLICATIONS

Reprint Series

82. This series contains selected papers contributed to learned journals and other publications by members of the Department's research staff, and others working in direct collaboration with the Department. During 1954-57 sixty new titles have been added to the series, which is circulated without charge to about three hundred institutions and scholars at home and abroad. A list of the first hundred titles, arranged under authors in alphabetical order, was circulated in 1956 and a copy may be obtained from the Department. A similarly arranged list of subsequent titles is given below:

ADAMS, A.A. and C.F. CARTER. Seasonal Adjustments of Time Series required for Economic Forecasting (No. 114).

ADAMS, A.A. and W.B. REDDAWAY. The Balance of the Economy: New Quarterly Statistics (No. 123).

ADAMS, A.A. and I.G. STEWART. Input-Output Analysis: An Application (No. 124).

ADLER, S. and D. PAIGE. International Comparisons of National Products: An Approach by Industry of Origin (No. 107).

AITCHISON, J. On the Distribution of a Positive Random Variable having a Discrete Probability Mass at the Origin (No. 113).

AITCHISON, J. and J.A.C. BROWN. On Criteria for Descriptions of Income Distribution (No. 108).

AITCHISON, J. and S.J. PRAIS. The Grouping of Observations in Regression Analysis (No. 110).

BRIGGS, F.E.A. On Estimation in Leontief Models (No. 136).

BROWN, J.A.C. and J. AITCHISON. On Criteria for Descriptions of Income Distribution (No. 108).

BRUMBERG, R.E. An Approximation to the Aggregate Saving Function (No. 118).

COLE, DOROTHY. Field Work in Sample Surveys of Household Income and Expenditure (No. 116).

COLE, DOROTHY and J.E.G. UTTING. Estimating Expenditure, Saving and Income from Household Budgets (No. 127).

DEANE, PHYLLIS. Contemporary Estimates of National Income in the First Half of the Nineteenth Century (No. 119).

DEANE, PHYLLIS. The Implications of Early National Income Estimates for the Measurement of Long-Term Economic Growth in the United Kingdom (No. 109).

DEANE, PHYLLIS. The Industrial Revolution and Economic Growth: The Evidence of Early British National Income Estimates (No. 128).

DEANE, PHYLLIS. The Output of the British Woollen Industry in the Eighteenth Century (No. 133).

FARRELL, M.J. The Measurement of Productive Efficiency (No. 135).

FORSYTH, F.G. A Statistical Study of the Productivity of Cambridgeshire Farms (No. 134).

MAYWALD, K. Fire Insurance and the Capital Coefficients in Great Britain, 1866-1952 (No. 122).

MAYWALD, K. National Savings and Changing Employment in Canada, 1926-54 (No. 120).

MAYWALD, K. The Best and the Average in Productivity Studies and in Long-Term Forecasting (No. 132).

MAYWALD, K. The Construction Cost and Value of the British Merchant Fleet, 1850-1938 (No. 115).

PAIGE, DEBORAH and S. ADLER. International Comparisons of National Products: An Approach by Industry of Origin (No. 107).

PFOUTS, R.W. Some Difficulties in a Certain Concept of Community Indifference (No. 111).

PRAIS, S.J. The Formal Theory of Social Mobility (No. 101).

PRAIS, S.J. and J. AITCHISON. The Grouping of Observations in Regression Analysis (No. 110).

REDDAWAY, W.B. Freeing Europe's Trade and Payments (No. 104).

REDDAWAY, W.B. Restrictions on International Trade and Payments (No. 125).

REDDAWAY, W.B. The Economic Position: December 1956 (No. 126).

REDDAWAY, W.B. and A.A. ADAMS. The Balance of the Economy: New Quarterly Statistics (No. 123).

ROBINSON, E.A.G. The Underlying Causes of the Autumn Crisis (No. 105).

STEWART, I.G. and A.A. ADAMS. Input-Output Analysis: An Application (No. 124).

STONE, RICHARD. Input-Output and the Social Accounts (No. 102).

STONE, RICHARD. Model Building and the Social Accounts: A Survey (No. 106).

STONE, RICHARD and D.A. ROWE. Aggregate Consumption and Investment Functions for the Household Sector considered in the Light of British Experience (No. 117).

STROTZ, R.H. Myopia and Inconsistency in Dynamic Utility Maximization (No. 129).

UTTING, J.E.G. National Income and Related Statistics (No. 112).

UTTING, J.E.G. and D. COLE. Estimating Expenditure, Saving and Income from Household Budgets (No. 127).

WATSON, G.S. On the Joint Distribution of the Circular Serial Correlation Coefficients (No. 121).

WATSON, G.S. Serial Correlation in Regression Analysis, I (No. 103).

WATSON, G.S. and E.J. HANNAN. Serial Correlation in Regression Analysis, II (No. 131).

Monograph Series

83. This series contains reports of investigations which have been carried out by members of the Department's research staff and others directly collaborating in its work. During 1954-57 two titles have been added to the series, which is published by Cambridge University Press.

84. The titles of the first five volumes are as follows:

No. 1. *The Measurement of Production Movements*. By C.F. CARTER, W.B. REDDAWAY and RICHARD STONE (1948).

No. 2. *Social Accounts and the Business Enterprise Sector of the National Economy*. By F. SEWELL BRAY (1950).

No. 3. *The Role of Measurement in Economics*. By RICHARD STONE (1951).

No. 4. *The Analysis of Family Budgets*. By S.J. PRAIS and H.S. HOUTHAKKER (1955).

No. 5. *The Lognormal Distribution*. By J. AITCHISON and J.A.C. BROWN (1957).

85. It is planned to publish in this series the results of the inquiries into interindustry relationships in the United Kingdom in 1948, and into the social accounts of Cambridgeshire.

Studies in the National Income and Expenditure of the United Kingdom

86. This series, which is under the general editorship of Professor Stone, is jointly sponsored by the Department and the National Institute of Economic and Social Research, and contains the results of research undertaken in both institutions. Three volumes have been published by Cambridge University Press, of which two (Nos. 3 and 5) contain the results of work undertaken at the Department, while the third (No. 1) contains the results of work undertaken at the National Institute by Professor Stone assisted by Mr D.A. Rowe and others. Work is proceeding at the National Institute on the second volume of Professor Stone's study of consumers' expenditure and behaviour, 1920-38, and at the Department on the volume dealing with the income and expenditure of public authorities during the interwar period.

87. It is hoped to publish in the series the results of Miss Deane's investigation into the regional social accounts of the United Kingdom in 1948, and Dr Maywald's study of capital formation during 1920-38.

88. The titles of the first five volumes are as follows:

No. 1. *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938*. Vol. I. By RICHARD STONE assisted by D.A. ROWE and others (1954).

No. 2. *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938*. Vol. II. By RICHARD STONE and D.A. ROWE. (In preparation.)

No. 3. *Consumers' Expenditure in the United Kingdom, 1900-1919*. By A.R. PREST assisted by A.A. ADAMS (1954).

No. 4. *Income and Expenditure of Public Authorities in the United Kingdom, 1920-1938*. By J.E.G. UTTING and DOROTHY COLE assisted by GISELA EISNER. (In preparation.)

No. 5. *Wages and Salaries in the United Kingdom, 1920-1938*. By AGATHA CHAPMAN assisted by ROSE KNIGHT (1953).

VI. PREMISES AND FACILITIES

Premises

89. The period of over five years during which the Department was accommodated in two separate buildings, some distance apart, was brought to an end in March 1957 when the entire staff of the Department was housed at 7 West Road. The premises consist of a large nineteenth-century house adapted for office use, onto which a single-storey extension has been built. In addition to a library and a meeting room, the building contains thirty offices, eight of which accommodate computers and clerical and secretarial staff. Most of the remaining research rooms are capable, when necessary, of accommodating two persons. Four rooms are at present used by visiting economists and members of the Faculty who are not on the Department's staff.

Library

90. During the years 1954-57 the contents of the library have been reorganized, and a number of publications removed, to preserve its usefulness as a working library. At the same time, about 400 books and 2500 pamphlets and research documents have been added, including part of the library of the late Dr L. Rostas. The Department receives 134 periodical series, forty of which are in exchange for the Reprint Series while forty-four are gifts, the remainder being purchased.

91. At 31 December 1957 the library contained the following publications:

Books	1600
British Government publications	6440
Pamphlets, papers, etc.	6000
Periodicals, series received:	
British	50
Foreign	84

Equipment

92. The Department now has thirteen electrically operated calculating machines which are mainly used by the computing staff, together with four hand-operated calculating machines for the use of research workers. In addition, the Department possesses three Sterling adding-listers and two simple adding machines.

93. The more elaborate calculations are, as far as possible, done on the automatic electronic computer, EDSAC, which has been built and is operated by the Mathematical Laboratory, and the Department is greatly indebted to the Director of the Laboratory, Dr M.V. Wilkes, for this assistance.

94. Besides the usual office equipment, the Department has obtained a portable photocopying machine for the purpose of recording material in public archives.

VII. STAFF

Research Staff

95. The following is a list of the research staff at December 1957:

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

Assistant Director: Mr J.E.G. UTTING, M.A. (Cantab.).

Senior Research Officers: Mr J.A.C. BROWN, M.A. (Cantab.); Miss P.M. DEANE, M.A. (Cantab.), M.A. (Glasgow); Mr H.S. DICKINSON, A.C.A.; Mr K. MAYWALD, M.A. (Cantab.), Ju.Dr. (Brno).

Research Officers: Mrs D.E. COLE, M.A. (Cantab.); Dr W.A. COLE, M.A., Ph.D. (Cantab.); Dr P.L. COOK, M.A., Ph.D. (Cantab.); Mr J.S. CRAMER, M.A. (Amsterdam); Mr F.G. FORSYTH, M.A. (Cantab.), M.Sc. (Econ.) (London); Mr A. GHOSH, M.A., D.Phil. (Calcutta); Miss D.C. PAIGE, M.A. (Cantab.), B.Sc. (Econ.) (London); Mr J.R.S. REVELL, B.Sc. (Econ.) (London).

Junior Research Officers: Mr T.A.B. CORLEY, M.A. (Oxon); Mr G.R. FISHER, M.A. (Cantab.), M.Com. (Birmingham); Mr S.F. KALISKI, M.A. (Toronto); Miss S.H. MEADOWS, B.Sc. (Soc.) (London); Dr L.J. SLATER, D.Litt., Ph.D. (Cantab.), M.A., Ph.D. (London); Mr A.D. SMITH, B.A. (Nottingham); Miss M.C. VIDAKOVIC, M.A. (Oxon).

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

Professor RICHARD STONE, M.A., Sc.D. (Cantab.).
Mr M.J. FARRELL, M.A. (Oxon), M.A. (Cantab.).
Miss M. WRAY, M.A. (St Andrew's), Ph.D. (London).
Mr A.A. GARRETT, M.A. (Cantab.), B.Sc. (Econ.) (London).

97. The following deaths are recorded with regret:

Mr RICHARD BRUMBERG, Ph.D. (The Johns Hopkins University), Junior Research Officer, on 6 August 1954.

Mr ARTHUR ADAMS, M.A. (Cantab.), Research Officer, on 3 August 1956.

98. The following were also members of the research staff during the period covered in this Report but have now left the Department:

Mr S. ADLER, B.A. (Oxon), M.Sc. (Econ.) (London).
Mr S.N. AFRIAT, D.Phil. (Oxon), M.A. (Cantab.).
Mr J. AITCHISON, M.A. (Cantab.), M.A. (Edinburgh).
Mr F.E.A. BRIGGS, M.A. (Cantab.), M.Sc. (Econ.) (London).
Mr E.B. BUTLER, B.Sc. (Econ.) (London).
Mr G.D. GARTON, M.A. (Liverpool), M.A. (Cantab.).
Miss P.M. HADDY, B.A. (London), M.S. (Cornell).
Mr D.T. HEALEY, B.Sc. (Econ.) (Belfast).
Mrs M.S.C. HEISELER, B.Sc. (University of Wales).
Mr J.J.H. MCGIBBON, M.A. (Edinburgh), M.A. (Cantab.).
Mr I.G. STEWART, M.A. (St Andrew's), M.A. (Cantab.).
Mr W.J.K. THOMAS, B.Sc. (University of Wales).

Assistant Staff

99. The following is a list of assistant staff at December 1957:

Secretary: Mr R.M.D. DAVIES, B.A. (London).

Secretarial and Clerical Staff: Miss D.G. FINDING; Mrs L.E. CHURCH; Miss J.M. SWANN;
Mrs B. NOONE; Miss E.M.A. CRACKNELL; Miss M.J. BOULTON.

Librarian: Miss O.E. HICKSON.

Senior Computer: Mrs E.M. CHAMBERS, M.A. (Cantab.).

Computers: Mrs M.J. BARNETT; Miss V.C.M. CHAPMAN; Miss M.R. CLARKE; Miss M.S.H. LOSHAK, B.A. (Cantab.); Miss F.M. TABRAM; Mrs M.S. TOMS, B.Sc. (London); Mr G. WARREN.