Curriculum Vitae

Michael Alan Howarth Dempster

Personal Information

Date of birth: 10.4.1938
Nationalities: Canadian, British

Present Position

Professor Emeritus (Mathematics and Statistics)
Centre for Financial Research
Statistical Laboratory
Centre for Mathematical Sciences

Professor of Management Emeritus (Finance and Management Science)
Cambridge Judge Business School

Quondam Fellow, Hughes Hall

University of Cambridge
Cambridge, England

Education

1961	University of Toronto, BA (Mathematics)
1963	Carnegie Institute of Technology, MS (Mathematics)
1965	Carnegie Institute of Technology, PhD (Mathematics)
1966	University of Oxford, MA (by decree)
2006	University of Cambridge, MA (by decree)

While a graduate student at what is now Carnegie Mellon University, studied economics, management science and mathematical psychology as well as mathematics, statistics and computer science.

Dissertation Title: On Stochastic Programming
(Supervisor: M H de Groot, Co-supervisor: M M Rao)

Previous appointments

1961-63	Ford Research Assistant, Graduate School of Industrial Administration, Carnegie Institute of Technology.
1963-65	Teaching Assistant, Department of Mathematics, Carnegie Institute of Technology.
1965-66	IBM Research Fellow, Mathematical Institute, University of Oxford.
1966	Research Fellow, Nuffield College, Oxford.
1967-79	Fellow and Tutor in Mathematics, Balliol College, Oxford.
1967-81	University Lecturer in Industrial Mathematics, University of Oxford. Member: Mathematics Faculty, Computing Sub-Faculty, Engineering Sub-Faculty, Economics Sub-Faculty.

1974-75	Fellow, Centre for Advanced Study in the Behavioural Sciences, Stanford, California.
1979-81	Senior Research Fellow, Balliol College, Oxford.
1979-81	Senior Research Scholar, System and Decision Sciences, International Institute for Applied Systems Analysis, Laxenburg, Austria (on special leave from Balliol College and University of Oxford).
1981-87	Lecturer in Mathematics, Balliol College, Oxford.
1981-93	Professor of Mathematics, Statistics and Computing Science, R A Jodrey Research Professor of Management and Information Sciences, Dalhousie University, Halifax, Nova Scotia, Canada (on leave 1990-93).
1988-89	Italian National Research Council Visiting Professor, Department of Statistics, Probability and Applied Statistics, University of Rome.
1990-95	Professor of Mathematics, University of Essex, Colchester, England.
1995	Resident Participant, Programme on Financial Mathematics, Isaac Newton Institute for Mathematical Sciences, University of Cambridge.
	Visiting Fellow, Department of Civil Engineering and Operations Research, Princeton University.
1996-02	Convenor, Finance and Accounting Group, Judge Institute of Management, University of Cambridge.
1997-01	Director of Research, Judge Institute of Management, University of Cambridge.
1997-02	Director of the PhD Programme, Judge Institute of Management, University of Cambridge.
2001	Resident Participant, Programme on Managing Risk, Isaac Newton Institute for Mathematical Sciences, University of Cambridge.
2005	Resident Participant, Programme on New Directions in Quantitative Finance, Isaac Newton Institute for Mathematical Sciences, University of Cambridge.
2014	Resident Participant, Programme on Systemic Financial Risk, Isaac Newton Institute for Mathematical Sciences, University of Cambridge.
2015-18	Honorary Adjunct Professor of Mathematics and Statistics, Xi'an Jiaotong University, Xi'an, China.

Research Interests

Mathematical and computational finance and financial engineering, Optimization, Nonlinear analysis, Stochastic systems, Algorithm analysis, Applications software, Intelligent systems, Telecommunication systems modelling, Mathematical biology and economics.

Professional Societies (current and past)

Academia Nationale dei Lincei (Foreign Member of the Italian Academy)

London Mathematical Society

American Mathematical Society

Canadian Mathematical Society

Institute of Mathematics and Its Applications (Fellow)

Institute of Actuaries (Honorary Fellow)

International Association of Financial Engineers

14-10 Club of the Royal Institution

Mathematical Programming Society

Operational Research Society

Institute for Operations Research and Management Sciences

Association for Computing Machinery

Institute of Mathematical Statistics

American Statistical Association

Econometric Society

Oxford Political Economy Club

American Institute of Decision Science

Public Choice Society

Sigma Xi Honorary Scientific Fraternity

Professional Activities

1965-66	Consultant (School timetabling), Kates, Peat, Marwick Limited, Toronto, Canada.
1967-77	Director, Society for Economic Analysis Limited (formerly Economic Study Society) and Member of Editorial Board of *The Review of Economic Studies*.
1969	Organizer, Institute of Mathematics and Its Applications Conference on Mathematics in Economics, LondonSchool of Economics.
1970-71	Visiting Senior Fellow, Manchester Business School.
1970	Visiting Professor of Mathematics and Economics, Institute for Quantitative Analysis of Social and Economic Policy, University of Toronto.
	Consultant (Forecasting government expenditure) TRACE National Econometric Model Project, University of Toronto.
1970-72	Consultant (Quantitative methods curricula), Graduate School of Public Policy, University of California, Berkeley.
1971	Appointed Co-editor, Series of Mathematical Textbooks and Monographs, Chapman and Hall Limited.
	Partner, Oxford Systems Group.
1972-74	External Examiner, MBA (Operations Analysis), London Graduate School of Business.
1974-79	Managing Director, Oxford Systems Associates Limited.
1974-80	Chairman, Oxford Systems Associates Limited.
1974	Organizer and Chairman of Programme Committee, Institute of Mathematics and Its Applications International Conference on Stochastic Programming, Oxford, July.
	Fellow, Institute of Mathematics and Its Applications.
1975	Visiting Professor, Department of Mathematics, University of Melbourne, September.
1976	Invited Speaker, IX International Symposium on Mathematical Programming, Budapest.
1977	Visiting Professor, Graduate School of Public Policy, University of California, Berkeley (summer).
	Appointed Associate Editor, *Stochastics*.
1977-78	Visiting Professor of Operations Research, The University College at Buckingham.
1977-79	External Examiner, BSc in Economics (Operations Research), The University College at Buckingham.
1978	Member of Programme Committee, Institute of Mathematics and Its Applications International Conference on the Analysis and Optimization of Stochastic Systems, September.
1978-79	Study Leader, Study on Stability and Control of Satellite Large Angle Manoeuvres, European Space and Technology Centre, Contract No 3665/78/NL/AK(SC).
1979	Member, International Programme Committee and Invited Speaker, X International Symposium on Mathematical Programming, Montreal, August.

	Member of International Organizing Committee, International Task Force Meeting on Decision Support Systems, IIASA, June, 1980.
	Appointed Member, Institute of Mathematics and Its Applications Committee on Mathematics in Management.
1980	Co-organizer, Task Force Meeting on Stochastic Optimization, IIASA, December.
	Chairman, Organizing Committee, Interdisciplinary Workshop Year on Theory of Human Intelligence, Centre for Advanced Study in the Behavioural Sciences, 1985-86.
1981	Member, International Organizing Committee, NATO/IMA Advanced Study and Research Institute on Deterministic and Stochastic Scheduling, Durham, UK, July.
	Member, Programme Committee, III International Colloquium on Stochastic Programming, Koszeg, Hungary, August.
1982	Member, International Programme Committee and Invited Speaker, XI International Symposium on Mathematical Programming, Bonn, FRG, August.
	Appointed Member, Committee on Stochastic Programming, Mathematical Programming Society.
1983	Member, Programme Committee, Canadian Operations Research Society Annual Meeting, Halifax, Nova Scotia, May, 1985.
	Academy Guest and Institute Lecturer, Central Economic Mathematics Institute, Academy of Sciences, Moscow, USSR
1984	Chairman, Steering Committee, Courseware Development Project, School of Business Administration, Dalhousie University.
	Invited Speaker and USSR Academy of Sciences Guest, International Conference on Stochastic Optimization, Kiev, USSR, September.
1985	Member, International Programme Committee and Invited Speaker, XII International Symposium on Mathematical Programming, Cambridge, Mass, August.
	Member, Pure and Applied Mathematics Grant Selection Committee, Natural Sciences and Engineering Research Council of Canada (1985-88).
1986	Appointed Member, Research Council, Canadian Institute for Advanced Research.
	Project Leader, Unisys (Sperry) University Grant Program in Artificial Intelligence.
1987	Member, Selection Committee, Canada-USSR Scholarly Exchange, Association of Universities and Colleges of Canada.
	Chairman, Pure and Applied Mathematics Grant Selection Committee, Natural Sciences and Engineering Research Council of Canada.
1988	Organizer, Task Force Meeting on Intelligent Decision Support, IIASA, March, 1989.
	Member, International Organizing Committee and Invited Speaker, XIII International Symposium on Mathematical Programming, Tokyo, Japan, August.
	Consultant, Canadian Forces Fleet School (Halifax) Scheduling, Synerlogic Inc, Halifax.
	Member, IFIP Working Group on Stochastic Optimization.
1989	Queens University-Steklov Institute Exchange Visitor, Steklov Mathematical Institute, USSR Academy of Sciences, Moscow, USSR, July-August.
	Member, International Program Committee and Invited Speaker, Fifth International Conference on Stochastic Programming, Ann Arbor, Michigan, August.
	Elected Member, Committee on Stochastic Programming, Mathematical Programming Society.
1990	Chairman, Technical Committee, Environmentally Sensitive Investment System Project, Industry, Science and Technology Canada AI Fund.
	Invited Speaker, XIV International Symposium on Mathematical Programming, Amsterdam, Netherlands, August 1991.

	Chairman, Programme Committee, International Conference/Workshop on Stochastic Optimization in Economics and Finance, Colchester, England, August 1991.
1991	Member, IFAC Working Group on Modelling and Control of National and Regional Economies.
1991-94	Information Management with Accounting BSc Scheme Director, University of Essex.
1992	Member, International Scientific Committee and Invited Speaker, Sixth International Conference on Stochastic Programming, Udine, Italy, September.
	Member, Programme Committee, IFAC International Conference on Computing in Economics and Decision Making, London, September.
1993-95	Director, Institute for Studies in Finance, University of Essex.
1993	Member, International Programme Committee, 3rd IFAC International Workshop on Artificial Intelligence in Economics and Management, Portland, Oregon, USA, August.
	Advisor (Pricing complex derivative securities) Midland Global Markets, London.
	Appointed Associate Editor, *Journal of Economic Dynamics and Control..*
1994	Member, International Organizing Committee and Invited Speaker, XV International Symposium on Mathematical Programming, Ann Arbor, Michigan, USA, August.
	Consultant (Vehicle routing), Barlow Tyrie Limited, Braintree, Essex.
	Consultant (Network modelling), British Telecom Laboratories, Martlesham, Suffolk.
	Consultant (Pricing cross currency derivatives) HSBC Markets, London.
1995	Appointed Member, MathematicsCollege, Engineering and Physical Sciences Research Council.
	Co-organizer, Bank of England Conference on Mathematics of Finance: Models, Theories and Computation, Isaac Newton Institute for Mathematical Sciences, Cambridge, May 1995.
	Member, International Scientific Committee and Invited Speaker, Seventh International Conference on Stochastic Programming, Haiffa, Israel, June 1995.
	Member, International Programme Committee, IFAC Symposium of Modelling and Control of National and Regional Economies, Gold Coast, Queensland, Australia, July 1995.
1996	Consultant (Comparative financial portfolio management techniques) Frank Russell Company, Tacoma, Washington.
	Organizer, Cambridge Financial Analysts and Securities Trading Executive Program (in conjunction with the Graduate School of Industrial Administration, Carnegie Mellon University and the Cambridge Programme for Industry).
	Consultant (Network design) British Telecom Laboratories.
	Consultant (High performance computing in financial services) Fujitsu Systems Europe Limited, London.
	Consultant (Dynamics of foreign exchange markets) FutureLogic Research, Orlando, Florida and Los Angeles, California.
	Appointed Associate Editor, *Computational Economics*.
1997	Keynote Speaker, Minisymposium on Operations Research for Financial Markets, Twenty second (National) Conference on the Mathematics of Operations Research, Lunteren, Netherlands, January.
	Director, Cambridge Risk Lab, Judge Institute.
	Appointed Member, Foresight Panel on Financial Services, Office of Science and Technology.
	Member, Organizing Committee, Third Workshop on Models and Algorithms for Scheduling and Planning Problems, Queen's College, Cambridge, April.
	Appointed Associate Editor, Net Exposure.

	Appointed Associate Editor, Computational Finance.
	Member, Organizing Committee, Fourth International Conference on Forecasting Financial Markets, London, May.
	Member, International Organizing Committee and Invited Speaker, XVI International Symposium on Mathematical Programming, Lausanne, Switzerland, August.
	Consultant (Network design) British Telecom Laboratories.
	Consultant (Preliminary design study for a strategic portfolio management system) Fujitsu European Centre for Information Technology, London.
1998	Chairman and Speaker, Euroforum School of International Capital Markets, Moscow, February.
	Member, Organizing Committee, Fifth International Conference on Forecasting Financial Markets, London, May.
	Consultant (GUI for CSA portfolio management system software) Fujitsu European Centre for Information Technology, London.
	Member, International Organizing Committee and Plenary Speaker, VIII International Conference on Stochastic Programming, Vancouver, Canada, August.
	Member, Organizing Committee, First Annual Risk Conference on Computational and Quantitative Finance, New York, September.
	Keynote Speaker, 4th Faculty and Institute of Actuaries Investment Conference and 8th International AFIR Colloquium, Cambridge, September.
	Co-organizer, Conference on Econometrics and Financial Times Series, Isaac Newton Institute for the Mathematical Sciences, Cambridge, October.
	Consultant (Network congestion pricing) Nortel.
1999	D E Shaw Best Paper Award, 1999 Computational Intelligence in Financial Engineering Conference, New York City, March (with D G Richards).
	Member, Organizing Committee and Invited Speaker, Conference on High-Performance Computing for Financial Planning, Ischia, Italy, April.
	Consultant (Forecasting commodity prices) Rio Tinto plc.
	Member, Organizing Committee, Sixth International Conference on Forecasting Financial Markets, London, May.
	Member, Technical Programme Committee, Sixteenth International Teletraffic Conference, Edinburgh, June.
	Keynote Speaker, Third Scandinavian Linear Programming Workshop, Lyngby, Denmark, August.
	Member, Organizing Committee, Second Annual Risk Conference on Computational and Quantitative Finance, New York, September.
	Track Organizer (Stochastic Programming), Forty First Operational Research Society Conference, Edinburgh, September.
	Principal Speaker, Inaugural Financial Engineering & Insurance Workshop, Bendheim Centre for Finance, PrincetonUniversity, November.
	Consultant (Operational risk measurement) Price Waterhouse Coopers.
2000	Consultant (Long term pension fund management DSS) Europlus Research and Management (now Pioneer Investments).
	Appointed Co-editor-in-chief (with J Doyne Farmer) Quantitative Finance.
	Keynote Speaker, Conference in honour of David Wilkie's 65th birthday, Heriot Watt University, Edinburgh, March.
	Plenary Speaker, Applied Mathematical Programming and Modelling 2000, Brunel University, London, April.
	Plenary Speaker, Computational Finance 2000, London, May.

	Member, UK-Korea Financial Services University Mission, Seoul, May.
	Appointed External Examiner, MSc in Finance (2000-2002), Birkbeck College, London.
	Appointed Honorary Fellow, Institute of Actuaries, London, July.
	Plenary Speaker, AIRO 2000, Milan, September.
	Plenary Speaker, 7th Annual CAP Workshop on Mathematical Finance, Columbia University, December.
	Plenary Speaker, SAFE Annual Capital Markets Conference, Kunmin, China, December.
	Keynote Speaker, IDEAL 2000, Hong Kong, December.
2001	Executive Briefing on the Global Economy, Coca Cola Corporate Management Group, London, January.
	Appointed External Examiner, Diploma and MSc in Finance, Birkbeck Collège, University of London, January.
	Appointed Manager and Trustee, Cambridge Endowment for Research in Finance, April.
	Programme Co-Chair, 8th International Conference on Forecasting Financial Markets, London, May.
	Plenary Speaker, UBM Conference on Statistical and Computational Problems in Risk Management, University of Rome, La Sapienza, June.
	Plenary Speaker, ABN Amro Financial Risk Management Seminar, Amsterdam, July.
	Participant, Programme on Managing Uncertainty, Isaac Newton Institute for Mathematical Sciences, July-August.
	Convenor, Pioneer Cambridge ALM Workshop, Judge Institute of Management, October.
	Speaker, Distinguished Speaker Seminar, School of Economic Studies, University of Manchester, November.
	Member, Programme Committee, 3rd Applications of Physics to Financial Analysis Conference, London, December.
2002	Invited Speaker, ILOG Technical Advisory Board, Paris, January.
	Keynote Speaker, Operations Research Society of Belgium, Brussels, January.
	Plenary Speaker, Workshop on Dynamic Stochastic Optimization, International Institute for Applied Systems Analysis, Laxenburg, Austria, March.
	Co-organiser, Cambridge/MIT Workshop in Finance, March and September.
	Invited Speaker, Conference on Credit Derivatives, London Guildhall University, April.
	Plenary Speaker, EURO Working Group on Finance Conference, Capri, May
	Programme Co-Chair, 9th International Conference on Forecasting Financial Markets, London, May.
	Plenary Speaker, Pioneer Investments Conference, Rome, June.
	Invited Speaker, AIMR Workshop, Cambridge, July.
	Plenary Speaker, Merrill Lynch Frontiers in Finance Conference, London, July.
	Keynote Speaker, IDEAL 2002, Manchester, August.
	Distinguished Speaker, Deloitte Consulting “Wake-up to Risk” Breakfast Seminar, London, October.
	Appointed Professorial Fellow, Hughes Hall, Cambridge, October.
	Li Ka Shing Distinguished Visiting Scholar to China: Beijing, Xian, Shanghai, Shantou, Shenzen, Hong Kong, October.
	Visitor, Bendheim Center for Finance, Princeton University, November.
	Sessional Speaker, Institute of Actuaries, London, November.

2003	Course Organiser, Risk Management Seminar, Institute of Bankers, Larnaca, Cyprus, February.
	Appointed Member, EPSRC College, February.
	Course Co-Organiser, Hedge Fund Strategies, London, February.
	Keynote Speaker, CIFEr 2003, Hong Kong, March.
	Invited Speaker, Cornhill – Allianz Academy, St Albans, May.
	Programme Co-Chair, 10th Conference on Forecasting Financial Markets, Paris, May.
	Plenary Speaker, Merrill Lynch Frontiers in Asset Allocation Conference, London, July.
	Plenary Speaker, Pioneer Investments Pension Conference, Frankfurt, October.
	Plenary Speaker, Merrill Lynch Advances in Foreign Exchange Conference, Stockholm, December.
	Appointed External Examiner, Diploma and MSc in Mathematical Finance, University of Oxford, December.
2004	Plenary Speaker, Kantorovich 100th Anniversary Conference, Steklov Mathematical Institute, St Petersburg, January.
	Plenary Speaker, Opening of the Centre for Computational Finance and Economic Agents, University of Essex, March.
	Plenary Speaker, OECD Pensions Conference, Paris, April.
	Consultant on Financial Services, Accounting Chamber of the Russian Federation, Moscow, April.
	Distinguished Speaker, Illinois Institute of Technology, Chicago, May.
	Visitor, Institute of Mathematics and Its Applications, Minneapolis, May.
	Programme Co-Chair, 11th International Conference on Forecasting Financial Markets, Paris, May.
	Plenary Speaker, Applied Mathematical Programming and Modelling 2004, Brunel University, June.
	Plenary Speaker, 17th Futures and Options Research Centre Annual Conference, University of Warwick, September.
	Honoured as Pioneer of Stochastic Programming, Mathematical Programming Society, October.
	Visitor, Lorentz Centre, University of Leiden, October.
	Keynote Speaker, 2nd IASTED Conference on Financial Engineering, Massachusetts Institute of Technology.
2005	Consultant on Re-Privatisation, Parliament of the Ukraine, Kiev, May.
	Plenary Speaker, 10th Workshop on Economic Heterogeneous Interacting Agents, University of Essex, June.
	Programme Co-Chair, 12th International Conference on Forecasting Financial Markets, Marseilles, June.
	Member of Review Committee, Department of Mathematics, National University of Singapore, August.
	Member of the Organising Committee and Invited Speaker, 2007 Computational Finance Conference, London.
2006	Member of Review Committee, Deutsche Forschungsgemeinschaft Applied Mathematical Centre Matheon, Technische Universität, Berlin, January.
	Plenary Speaker, AmaMef Conference on Numerical Methods in Finance, INRIA Laboratory, Paris, February.
	Invited Speaker, CARISMA Conference on New Directions in Financial Modelling, London, May.

Programme Co-Chair, 13th International Conference on Forecasting Financial Markets, Aix-en-Provence, June.

Keynote Speaker, All-Russia Camp for Education and Innovation, Lake Seliger, July.

Invited Speaker, Merrill Lynch Conference on Credit Correlation, London, September.

Member, Deutsche Forshungsgemeinschaft Panel on Excellence in Scientific Computing, Bonn, November.

Plenary Speaker, Quantitative Methods in Finance Conference, Sydney, December.

2007 Invited Speaker, International Conference on Energy and Commodities, Birkbeck College, London, January.

Co-organizer and Presenter, Formal Opening of Cambridge Finance, Gresham College, London, March.

Invited Speaker, IMA Conference on Computational Finance, London, March.

Member, Scientific Committee and Invited Speaker, MSRI World Congress on Computational Finance, London, March.

Invited Speaker, Conference on Russia and the Global Economy, MGIMO, Moscow, March.

Member, Programme Committee and Invited Speaker, International Conference on Stochastic Programming, University of Bergamo, Italy, April.

Invited Speaker, Finance Seminar, University of Zurich, May.

Co-Presenter, Concentric Risk Management Course, Milan, May.

Invited Speaker, Incisive Media Course on Portfolio Construction, London and New York, May.

Programme Co-Chair, 14th International Conference on Forecasting Financial Markets, Aix-en-Provence, June.

Co-Presenter, Incisive Media Workshop on Strategic Portfolio Construction, Annual risk Conference, London, June.

Invited Speaker, 3rd CARISMA Seminar, London, June.

Member, Deutsche Forshungsgemeinschaft Panel on Computational Finance Initiative, Bonn, June.

Invited Speaker, EURO XXII, Prague, July.

Member, International Scientific Committee and Invited Speaker, 11th International Conference on Stochastic Programming, Vienna, August.

Invited Speaker, 3rdCambridge-Princeton Finance Workshop, Bendheim Center, Princeton University, September.

Invited Speaker, CARISMA Conference on Asset Liability Management and Liability Driven Investment. London, November.

2008 Invited Speaker, 3rdBachelier Colloquium, Metabief, France, January.

Keynote Speaker, Swiss Investment Managers' Circle, Zermatt, Switzerland, January.

Invited Speaker and ALM Chairman, Alpha Invest, Stockholm, January.

Invited Speaker, Symposium on FX Market Microstructure, Department of Economics, Brunel University, February.

Invited Speaker, CIBAM Symposium on Global Finance, Cambridge Judge Business School, February.

Panelist, Deloitte Public Finance Roundtable, Houses of Parliament, Westminster, February.

Panelist, Cass-Capco Conference on Risk, Cass Business School, London, April.

Invited Speaker, China Banking Regulatory Commission Conference on Systematic Investment and Systemic Risk, Möller Centre, Cambridge, May.

Invited Speaker, RISK Training Course on Portfolio Construction, New York and London, May.

Invited Speaker, Forum on Asset management and Risk Control, Renmin University, Beijing, May.

Invited Speaker, ICBI Global Derivatives, Trading and Risk Management, Paris, May.

Invited speaker, Manchester Leeds Workshop on Mathematical. Economics and Finance, Manchester Business School, May.

Programme Co-Chair, 15th International Conference on Forecasting Financial Markets,Aix-en-Provence, June.

Invited Speaker, Derivatives Technology Foundation Conference, Amsterdam, June.

Invited Speaker, 4th CARISMA Seminar, London, July.

Invited Speaker, 5th World Congress of the Bachelier Finance Society, Imperial College, July.

CARIPLO Workshop on Numerical Linear and Nonlinear Stochastic Programming, University of Edinburgh, September.

Invited Speaker, 4th Cambridge-Princeton Conference on Finance, Judge Business School, September.

Invited Speaker, Incisive Media. Quant Congress Europe,London, November.

Co-organizer and Invited Speaker, Cambridge Finance Event on the Credit Crisis, December.

2009 Invited Speaker, *In*Vantage Algo Trade Conference, London, March.

Colloquium Speaker, Institute of Finance, University of Leicester, March.

Invited Speaker, Risk Training’s Portfolio Construction Course, London, April.

Invited Speaker and Commodities Session Chairman, ICBI Global Derivatives, Trading and Risk Management, Rome, April.

Invited Principal Speaker, ITWM Finance Workshop, Fraunhofer Institute, Kaiserlautern, Germany, May.

Featured Speaker, IBM ILOG Optimization for Quantitative Finance Breakfast, London, May.

Programme Co-Chair, 16th International Conference on Forecasting Financial Markets,Aix-en-Provence, June.

Invited Speaker, Mathematical Finance Seminar, Mathematical Institute, Oxford, June.

Invited Speaker, Transform Methods in Quantitative Finance Conference, University of Leicester, June.

Co-presenter, MKE Seminar, Ludwig Maxmillians Universität, Munich, July.

Invited Speaker, 5th Cambridge-Princeton Workshop, Bendheim Center, Princeton University, September.

Invited Speaker, CARISMA Asset Liability Management Forum, London, November.

Invited Speaker, NIDA Conference on Quantitative Finance, Bankok, December.

IIM Conference on Risk Management, Indian Institute of Management, Kolkata, December.

2010 Invited Speaker, Risk Sharing in DC Pension Schemes Conference, University of Exeter, January.

Invited Speaker, 5th CARISMA Conference (on Behavioural Finance), London, February.

Invited Speaker, Finance Seminar, Cass Business School, London.

Co-presenter, Sessional Meeting of the Institute of Actuaries (on Individual Household Asset Liability Management) Staple Inn Hall, London, February.

Invited Speaker, Conference in Honour of Professor M H A Davis, Imperial College, London, April.

Course Director and Presenter, Agricultural Bank of China Senior Executive Risk Management Programme, Cambridge, April.

Invited Speaker and Commodity Session Chair, ICBI Global Derivatives Trading and Risk Management, Paris, May.

Programme Co-Chair, 17th International Conference on Forecasting Financial Markets, Aix-en-Provence, June

Invited Speaker, 6th World Congress of the Bachelier Finance Society, Toronto, June.

Invited Speaker and Scientific Committee Member, 12th Triennial International Conference on Stochastic Programming, Dalhousie University, Halifax, Nova Scotia, August.

Invited Speaker and Discussant, 6th Cambridge-Princeton Conference on Finance, Judge Business School, Cambridge, September.

Course Director and Presenter, China Minsheng Bank Senior Executive Programme, Cambridge, September.

Course Director and Presenter, China Merchants Securities Senior Executive Programme, Cambridge, November.

Panelist, Analytical Models for Sovereign Debt Management Conference, British Academy, London, December.

Invited Speaker, OECD-WPC World Pensions and Investments Forum, OECD, Paris, December.

2011 Invited Speaker, 5thBachelier Colloquium, Metabief, France, January.

Invited Lecturer, Graduate Course on Options Theory and Structured Products, University of Bergamo, March.

Invited Speaker, Litigation Aftermath of the Global Financial Crisis Conference, British Institute of International Comparative Law, London, March.

Invited Speaker and Commodities Session Chair, Global Derivatives, Trading and Risk Management, Paris, April.

Discussant, 1st Cambridge Finance-University of Pennsylvania-Tinbergen Institute Conference, Duisenberg School of Finance, Amsterdam, May.

Programme Co-Chair, 19thx International Conference on Forecasting Financial Markets, Aix-en-Provence, June

Invited Speaker, Marcus Evans 2nd Practical Quantitative Analysis in Commodities Conference, London, June.

Discussant, CIMF/IESEG Conference on the Yield Curve in Macro Finance, Clare College, Cambridge, September.

Invited Speaker, 7th Cambridge-Princeton Conference on Finance, Bendheim Center, Princeton University, September.

Course Director and Presenter, China Merchant Securities Senior Executive Programme, Cambridge, September.

Distinguished Speaker, Central Economic Mathematics Institute, Russian Academy of Sciences, Moscow, October.

2012 Invited Speaker, 6thBachelier Colloquium, Metabief, France, January.

Invited Speaker, Commodities Session Chair and Roundtable Discussant, ICBI Global Derivatives, Trading and Risk Management, Barcelona, April.

Invited Speaker, CARISMA Workshop on Asset Liability Management, London, May.

Programme Co-Chair, 20th International Conference on Forecasting Financial Markets, Aix-en-Provence, June.

	Elected Chairman, Supervisory Board, High Performance Computing in Finance EUMarie Curie Project, June.
	Discussant, 8th Cambridge-Princeton Conference on Finance, Robinson College, Cambridge, September.
	Invited Speaker, Conference on the Financial Crisis, Newnham College, Cambridge, September.
	Invited Panelist, Portfolio Masters Emerging Markets Conference, London, November.
	Keynote Speaker, Centre for Computational Finance and Economics 10th Anniversary Conference, University of Essex, November.
	Invited Speaker, Intelligent Systems Laboratory Seminar, University of Bristol, December.
	Invited Speaker, Financial Litigation Conference, London, December.
2013	Invited Speaker, HPC Finance Project Kickoff Meeting, University of Aarhus, Denmark, January.
	Invited Speaker, Incisive Training's Variable Annuities Course, London, March.
	Keynote Speaker, Risk Centre Workshop on Financial Catastrophe, Cambridge Judge Business School, April.
	Invited Speaker and Interest Rates Session Chair, ICBI Global Derivatives, Trading and Risk Management, Amsterdam, April.
	Invited Speaker, HPC Finance Project Workshop on Computational Methods, Technical University of Tampere, Finland, May.
	Programme Co-Chair, 21st International Conference on Forecasting Financial Markets, Hanover, May.
	Invited Speaker, Advanced Finance and Stochastics Conference, Steklov Mathematical Institute, Russian Academy of Sciences, Moscow, June.
	Appointed Member, Executive Committee, Laboratory for Quantitative Finance, Higher School of Economics, Moscow
	Keynote Plenary Speaker, 13th International Conference on Stochastic Programming, University of Bergamo, Italy, July.
	Elected Foreign Member of the Academia Nationale dei Lincei, Rome, Italy, July.
	Invited Speaker, 8th Cambridge-Princeton Conference on Finance, Bendheim Center, Princeton University, September.
	Invited Speaker, Fondazione Centisimus Annus - Pro Pontifice International Consultation on the Debt Crisis, Financial Reform and the Common Good, Vatican City, September.
	Invited Speaker, INET Workshop on the Mathematics for New Economic Thinking, Fields Institute for Research in Mathematical Sciences, University of Toronto, October.
2014	Co-organizer and Speaker, HPC Finance Project Mid-Term Conference, London, February.
	Invited Speaker, Rustat Conference on Risk and the Misuse of Statistics, Jesus College, Cambridge, March.
	Invited Speaker, Incisive Training's Variable Annuities Course, London, March.
	Invited Speaker, NAB Customer Support Group Meeting, Aberdeen, March.
	Keynote Plenary Speaker, 2014 Computational Intelligence in Financial Engineering Conference, University College, London, March.
	Invited Session Chairman, Computation in Finance and Insurance - post-Napier, Royal Society of Edinburgh, April.
	Invited Speaker, 14th Math Finance Conference, Frankfurt, April.
	Invited Speaker and Interest Rates Session Chair, ICBI Global Derivatives, Trading and Risk Management, Amsterdam, April.

Invited Speaker, 3rd Cambridge Finance-University of Pennsylvania-Tinbergen Institute Conference, Duisenberg School of Finance, Amsterdam, May.

Invited Speaker, Political Economy Seminar, Emmanuel College, Cambridge, May.

Programme Co-Chair, 21st International Conference on Forecasting Financial Markets, Marseille, May.

Invited Panelist, Portfolio Masters Alternative Credit Conference, London, July.

Participant and Speaker, Programme on Systemic Risk, Isaac Newton Institute for Mathematical Sciences, August- December.

Presentation and Session Chair, 10th Cambridge-Princeton Conference on Finance, Cambridge Judge Business School, September.

2015 Invited Speaker, Mathematics Colloquium, University of Liverpool, March.

Invited Speaker, Incisive Training's Unit Linked Guaranteed Products Forum, London, March.

Invited Speaker, Incisive Media's Quant Europe, London, April.

Invited Speaker and Informed Discussion Presenter, ICBI Global Derivatives, Trading and Risk Management, Amsterdam, May.

Programme Co-Chair, 22nd International Conference on Forecasting Financial Markets, Rennes, France, May.

Invited Plenary Speaker, International Conference on Computational Mathematics, Xi'an Jiaotong University, Xi'an, China, June.

Invited Speaker, School of Mathematics and Statistics, Xi'an Jiaotong University, Xi'an,

Appointed Honorary Adjunct Professor of Mathematics and Statistics 2015-2018, Xi'an Jiaotong University, Xi'an, China, June.

Invited Speaker, School of Social Science, Tsinghua University, Beijing, China, June.

2016 Invited Speaker, Mathematics Colloquium, University of Sussex, February

Invited Speaker, Incisive Training's Unit Linked Guaranteed Products Forum, London, March.

Invited Speaker, Incisive Media's Quant Europe, London, April.

Invited Speaker and Session Chair, ICBI Global Derivatives, Trading and Risk Management, Budapest, May.

Programme Co-Chair, 23rd International Conference on Forecasting Financial Markets, Rennes, Hannover, May.

Keynote Speaker, China Futures Association Annual Conference, Shenzhen, China, December

Invited Speaker, Nottingham Ningbo University Conference on Derivative Innovation, Ningbo, China, December.

2017 Invited Speaker, Mathematics Colloquium, University of Leicester, February.

Invited Speaker, Incisive Training's Non-traditional Life Insurance Products with Guarantees, London, March.

Invited Speaker, Session Chair and Speaker Roundtable, ICBI Global Derivatives, Trading and Risk Management, Barcelona, May.

Invited Speaker, Conference in Honour of Jim Gatheral, Courant Institute, New York University, October.

2018 Invited Speaker, Risk’s Quant Minds 2018, London, March.

2020 Invited Speaker, International Conference on Futures and Other Derivatives, Zhuhai, China, December.

2022 Invited Speaker, Pension fund management using stochastic optimization techniques, South Korean Government Conference on National Pension Funding, Seoul, November.

Doctoral Dissertations Supervised

1967 Y Morimoto, Aggregation Problems in Input-Output Analysis (Economics).

1969 N J Young, Problems in the Theory of Games (Mathematics).

1971 A G Christie, Multi-dimensional Combinatorial Scheduling Algorithms (Engineering).

1972 B G Jackson, A Simulation Model of the Forest Products Sector of the UK Economy (Forestry).

1974 J M Borwein, Optimization with Respect to Partial Orderings (Mathematics).

1975 J D Eden, A Model of the Initial Phase of a Mining Venture (Management).

1976 A Punter, Systems for Timetabling by Computer Based on Graph Colouring (Mathematics).

D Papoulias, Investigation of Combinatorial Time-tabling Systems (Management).

1977 P T Hicks, A Study of the Multi-product Single-facility Production and Inventory Control System (Management).

1978 D S Collat, Voting and the Formation of Economic Policy (Economics).

1980 A Papagaki-Papoulias, Investigation of the Distribution Problem of Stochastic Linear Programming Using Interval Arithmetics (Management).

1986 E Solel, A Dynamic Approach to Stochastic Scheduling via Stochastic Control (Mathematics).

1987 R R Merkovsky, Near-linearly Convergent Procedures for Large Scale Optimization Based on Linear Programming: Theory and Applications (Mathematics).

1990 A M Ireland, An Expert Decision Support System for Debt Management (Computing Science and Management).

J J Ye, Optimal Control of Piecewise Deterministic Markov Processes (Mathematics).

1995 X Corvera Poiré, Dynamic Stochastic Programming Model Generation and Sampling Algorithms (Mathematics).

J P Hutton, Fast Pricing of Derivative Securities (Mathematics).

1996 G Gotsis, Pricing Risk for Interest Rate Derivatives (Mathematics).

1997 R T Thompson, Fast Sequential and Parallel Algorithms for Solving Multistage Stochastic Linear Programmes (Mathematics).
G Consigli, Dynamic Stochastic Programming for Asset and Liability Management (Mathematics).

1998 N Hicks Pedrón, Model Based Asset Liability Management: A Comparative Approach (Management).

1999 D G Richards, Pricing American Exotic Options (Management).

C M Jones, Automated Technical Foreign Exchange Trading with High Frequency Data (Management).

2001 M N Kyriacou, Financial Risk Measurement and Extreme Value Theory (Management).

A Sembos, Dynamic stochastic Programming for Strategic Planning Problems (Management).

S-S G Hong, Pricing and Hedging of Spread Options with Stochastic Component Correlation (Management).

J E Scott, Modelling and Solution of Large Scale Stochastic Programmes (Management).

A Eswaran, Wavelet Based PDE Valuation of Swaps and Swaptions (Management).

2002 V Srikanth, Evolutionary Algorithms for Currency Trading (Management).

S Q Khokhar, Valuation of Strategic Investments Using Real Options Analysis (Management).

2003 Y S Romahi, Computational Learning Techniques in High Frequency Foreign Exchange Trading (Management).

M Villaverde, Stochastic Optimization Approaches to Pricing, Hedging and Investment in Incomplete Markets (Management).

2005 G Grobe, Real Options Analysis of Investment Under Multiple Sources of Uncertainty (Management).

B Carton de Wiart, Wavelet Optimized PDE Methods for Financial Derivatives (Management).

M C Lennon, Intensity Based Modelling with Dynamic Correlation Applied to Portfolio Credit Risk (Management).

M I Rietbergen, Long Term Asset Liability Management for Minimum Guaranteed Return Funds (Management).

2006 R G Smith, Using a Structural Credit Model to Link the Equity and Debt Markets (Management).

2007 V Leemans, Modelling Local Order Book Dynamics in Financial Markets (Management).

H G Go, Dynamic Sampling Methods for Long Term Wealth Management (Management).

2008 K Tang, Stochastic behaviour of Commodity Prices and Price Spreads with Applications (Management)

2009 S W Yang, Entropy Based Models of Portfolio Credit Risk (Management)

2010 J K Murphy, Bayesian Methods for High Frequency Financial Time Series Analysis (Eng)

2014 E Antar, Risk Measures Equations and Financial Innovation with Backwards Stochastic Difference/Differential Equations (Mathematics).

Doctoral Dissertations Currently Under Supervision

I Savoulli, Generalized HJB Equations, Viscosity Solutions and Computational Algorithms for Piecewise Deterministic Markov Processes (Mathematics).

Postdoctoral Fellows Supervised

1986-88 M Teboulle, Topics in Stochastic Optimization, Department of Mathematics, Statistics and Computing Sciences, Dalhousie University (Supported by NSERC).

1988-90 A Lewis, Topics in Optimization, Department of Mathematics, Statistics and Computing Sciences, Dalhousie University (Supported by NSERC).

1996-97 Z Chen, Parallel Optimization of Dynamic Stochastic Programming (Supported by EPSRC).

1997 R T Thompson, Applications of High Performance Computing (Supported by BT Laboratories and Fujitsu Systems).

1997 G Consigli, Algorithms for Large Scale Financial Portfolio Management (Supported by EU and Frank Russell Company).

1998-99 R Sarkissian, Optimization Algorithms Exploiting Problem Structure (Supported by Swiss National Research Council and EU).

1998-00 N Hicks Pedrón, Asset Liability Management Modelling (Supported by EU).

1999-0 A Moresino, Stochastic Optimization in Finance (Supported by Swiss National Research Council).

1999-02 D G Richards, Dynamic Risk Management (Supported by DTI and Algorithmics Inc).

2000-02 G W P Thompson, Dynamic Risk Management (Supported by DTI, Algorithmics Inc and Cambridge Systems Associates Limited).

2000-03 J E Scott, Stochastic Optimization (Supported by Cambridge Systems Associates Limited).

2005-06 M I Rietbergen, Individual Asset Liability Management (Supported by Morgan Stanley and Cambridge Systems Associates Limited).

2013-14 W Tekaya, Dynamic Stochastic Optimization Techniques (Supported by EU Marie Curie HPC Finance Project).

2013-16 P A Ustinov, Topics in Financial Mathematics and Econometrics (Supported by EU Marie Curie HPC Finance Project and Cambridge Systems Associated Limited).

2014-16 I Osmolovskiy, Topics in Financial Mathematics and Econometrics (Supported by EU Marie Curie HPC Finance Project and Cambridge Systems Associated Limited).

Teaching Experience

Undergraduate Tutorial Teaching (Juniors and Seniors, Oxford)

Abstract and linear algebra, Real and complex analysis, Measure theory, Integral and differential equations, Partial differential equations, Probability and stochastic processes, Functional analysis and operator theory, Optimization, Numerical linear algebra and analysis, Operations research, Combinatorics, Statistics, Statistical decision theory, Econometrics

Undergraduate Courses

Introduction to Mathematics (Carnegie Tech.)
Introduction to Probability and Statistics (Carnegie Tech.)
Optimization Theory (Math., Oxford)
Combinatorial Optimization (Math., Oxford)
Operations Analysis I. Mathematical Programming (Eng., Man. and Econ., Oxford)
Operations Analysis II. Applied Probability (Eng., Man. and Econ., Oxford)
Introduction to Operations Analysis (UC Buckingham)
Calculus of Variations and Optimal Control (Math., Dalhousie)
Operational Research (Math., M.O.R.E., I.M.A., Essex)
Optimization: Theory and Algorithms (Math., Essex)

Graduate Courses

Probability and Stochastic Processes (Math., Oxford and Dalhousie)
Optimization of Stochastic Systems (Math., Dalhousie)
Nonlinear Programming (Math., Dalhousie)
Statistical Decision Theory (Math., Oxford)
Abstract Optimization Theory and Its Applications (Math., Oxford)
Analysis of Algorithms (Comp. Sci. and Math., Dalhousie)
Mathematics for Economists (Econ., Oxford)
Linear Economic Models (Econ., Oxford)
Time Series Analysis (Econ., Oxford)
Statistical Methods of Econometrics III: Linear Econometric Models and Extensions (Econ., Oxford)
Research Methodology: Decision Theory and Statistics (Manchester Business School)
Financial Mathematics (Math., Essex)
Mathematical Models for Financial Management (MPhils in Management, Finance & Statistics and Part III Mathematics, Cambridge)
Derivative Securities (MBA Elective, Cambridge)
Risk Management Techniques (MBA Elective, Cambridge)
Hedge Funds (MBA Elective, Cambridge)
Options and Structured Products (Math, University of Bergamo)

Graduate Teaching Seminars

Mathematical Economics (Econ, Oxford, variously with M O L Bacharach, A K Dixit, J L Enos, J A Mirrlees, R D Portes and J E Stiglitz).

Mathematical Systems Theory (Eng, Oxford, with O L R Jacobs).

Economic Theories of Politics (Econ and Politics, Oxford, with B A Barry and J L Enos).

Animal Economics (Biol and Econ, Oxford, with D J McFarland).

Optimization Study Group (MS and CS, Dalhousie University, with J M Borwein).

Topics in Game Theory (Math, Econ, Politics and Biol, Oxford, with M O L Bacharach and J L Enos).

Algorithm Analysis (Math, Comp Sci, Econ, Oxford, with J L Enos and C J H McDiarmid).

Mathematical Models in Economic Theory (Math, Econ, Oxford, with M O L Bacharach and J L Enos).

Optimization (MS and CS, Dalhousie University, St Mary's University, Technical University of Nova Scotia).

Mathematics of Finance (Stats, Prob and Appl Stats, La Sapienza, Maths, Essex).

Probability and Stochastic Processes (Maths, Essex).

Financial Engineering (Centre for Financial Research, Cambridge, with E A Medova).

Grants and Contracts (since 1981)

1981-82	Killam Fund (Dalhousie University)	C$10,000
1982-83	Natural Sciences and Engineering Research Council of Canada (NSERC) Operating Grant	18,266
	NSERC Collaborative Project, Mathematical Models of Genome Evolution (Co-investigator)	36,050
1983-84	NSERC Operating Grant	21,974
	NSERC Equipment Grant (Co-investigator)	15,858
1984-85	NSERC International Scientific Exchange Award -Dr. I. Deak, Budapest	10,000
	Research Development Fund - Science (Dalhousie University)	4,500
	Dalhousie University, School of Business Administration Computing Laboratory and Develswitch (Principal Co-investigator)	100,000
1984-87	NSERC Operating Grant - 30,200 p.a.	90,060
	NSERC Infrastructure Grant, Computing	90,060
	NSERC Infrastructure Grant, Computing Science (Co-investigator) - 31,500 p.a.	94,500
1985-86	Bank of Nova Scotia, Courseware Development Project (Principal Co-investigator)	500,000
	Dalhousie University Capital Fund and Digital Equipment Corporation, School of Business Administration, MicroVAX II Network (Principal Co-investigator)	750,000
	Sperry University Grant Program in Artificial Intelligence Explorer/KEE AI Workstation (Project Leader)	202,450
1986-87	Research Development Fund - Science (Dalhousie University, Co-investigator)	4,000
	NSERC Major Equipment Grant, Mathematics, Statistics and Computing Science, VAX 11-785 (Co-investigator)	307,083

	NSERC Equipment Grant, Fibre Optic Ethernet Between School of Business Administration - Killam Library - Chase Building (Principal Investigator)	47,181
	Northern Telecom University Interaction Program, 16 Channel Fibre Optic Cable (1.2km) (Principal Co-investigator)	22,000
1987-90	NSERC Operating Grant - 25,000 p.a.	75,000
1987-88	President's Alumni Fund (Dalhousie University)	5,000
	Student Council, Courseware Development Project (Dalhousie University), Principal Co-investigator)	18,000
	Digital Equipment Corporation and Dalhousie University, School of Business Administration, Computer Laboratory Ethernet Local Area Network (Principal Co-investigator)	110,000
	NSERC International Scientific Exchange Award - Prof. V. I. Arkin, Moscow	5,500
1988-91	NSERC Infrastructure Grant, Computing Science (Co-investigator) - 56,000 p.a.	168,000
1988-89	Nova Scotia Department of Industry, Trade and Technology Feasibility Study, Centre for Management of Technology (Principal Co-investigator)	75,000
	Visiting Professorship, Committee on Functional Analysis and Applications (GNAFA), Italian National Research Council	7,500
1989-90	NSERC Equipment Grant, Mathematics, Statistics and Computing Science, SUN 4 Upgrade (Co-investigator)	45,663
	NSERC Operating Grant	25,000
1991-93	AI Fund, Industry, Science and Technology Canada and Industrial and Governmental Partners, Environmentally Sensitive Investment System Project (Principal Co-investigator)	750,000
1991-94	NSERC Operating Grant - 22,000 p.a.	66,000
1991	Vice-Chancellor's Fund (University of Essex), IBM RS6000/530 Workstation and Peripherals	£45,000
1993-94	Research Promotion Fund (University of Essex), Start-up Grant for Institute for Studies in Finance (Principal Co-investigator)	3,000
	Midland Bank plc (Midland Global Markets),Valuation of Complex Cross Currency Derivative Securities	12,000
	Research Promotion Fund (University of Essex), RS6000 Workstation and Disk for Finance Research Group	10,000
1994-96	SERC Equipment Grant, RS6000/590 (530 Upgrade) Large Scale Stochastic Programming Algorithms	45,000
1994	SERC Visiting Fellowship Award-Dr. I. V. Evstigneev, Moscow Controlled Random Fields on Graphs and Networks	5,000
1994-97	SERC Earmarked Studentship, Fast Pricing of Derivative Financial Products by Linear Programming	c.24,000
1994	British Telecom Laboratories (Performance Engineering), Integrated System Modelling for ATM (Principal Co-investigator)	29,750
1994-96	EPSRC Computational Science Grant, Massively Parallel Decomposition of Stochastic Optimization Problems	67,329
1994-97	EPSRC Earmarked Studentship, Massively Parallel Decomposition of Stochastic Optimization Problems	c.24,000

1994-95	British Telecom Laboratories (Network Research Unit), Design and Control of Multi-layer ATM/SDH Networks (Principal Co-investigator)	30,000
1994-95	Hong Kong Shanghai Banking Corporation (HSBC Markets) Valuation of Complex Cross Currency Derivatives (Continuation)	16,000
	Research Promotion Fund (University of Essex), RS6000 4.2 GB Disk for Finance Research Group	3,032
1995-97	EPSRC/ROPA Information Technology and Computer Science Grant, Management Algorithms for Multimedia Networks	108,000
1995-96	British Telecom Laboratories (Transport Design and Performance Unit), Integrated System Modelling for ATM (Continuation) (Principal Co-investigator)	35,000
	Frank Russell Company, Strategic Asset Allocation	20,000
1996-98	European Union (INCO) High Performance Computing in Finance (Co-investigator, 500 kECU Overall Project)	35,000
1996-97	British Telecom Laboratories (Broadband and Data Networks Unit), Network Design Tool	25,000
1996-97	FutureLogic Research, Dynamics of Foreign Exchange Markets	80,000
	Fujitsu European Centre for Information Technology, Rôle of High Performance Computing in Financial Services	20,000
1997-00	European Union (ESPRIT), Hydrocarbon and Chemical Logistics Optimization Under Uncertainty via Stochastic Optimization (Co-investigator, 3.6 MECU Overall Project)	180,000
1997	British Telecom Laboratories (Broadband and Data Networks Unit), Network Design Tool (Continuation)	15,000
1997	Fujitsu European Centre for Information Technology, Preliminary Design Study for a Strategic Portfolio Management System	20,000
1998-2000	Citibank, Analysis of Complex Contingent Claims in High Dimensions	150,000
1998	Fujitsu European Centre for Information Technology, Demo GUI for CSA Portfolio Management System Software	20,000
1998-99	PricewaterhouseCoopers, Operational Risk Measurement	50,000
1999-01	Teaching Company Directorate, DTI and Algorithmics (UK) Limited, Dynamic Risk Management	191,200
1999	Rio Tinto plc, Forecasting Commodity Prices	24,000
1999-01	Europlus Research & Management and UniCreditBancaMobiliare, Decision Support System for Long Term Pension Fund Management	300,000
2001	Agip Petroleum, Real Options Manual	75,000
	Wide Learning, Derivatives Course	10,000
2002	Deloitte Consulting, Economic Capital Allocation in Financial Institutions	37,500
	Hong Kong Shanghai Banking Corporation (HSBC Investment Bank), FX Trading Systems	37,500
	Pioneer Investments, Decision Support System for Long Term Pension Fund Management (continuation)	100,000
	UniCreditBancoMobliare, Seminar Support	€30,000

2003	Credit Suisse First Boston, Formal Representation of Derivative Contracts	75,000
	Hong Kong Shanghai Banking Corporation (HSBC Investment Bank), FX Trading Systems (continuation)	25,000
	Merrill Lynch, Forecasting Earnings per Share	$15,000
	Pioneer Investments, Decision Support System for Long Term Pension Fund Management (continuation)	135,000
	Fujitsu European Centre for Technology, Credit Modelling	5,000
	Morgan Stanley, Individual Asset Liability Management	75,000
2004	Banquo Credit Management, Credit Risk Management	15,000
	Pioneer Investments, Decision Support System for Long Term Pension Fund Management (continuation)	200,000
	Morgan Stanley, Individual Asset Liability Management (continuation)`	250,000
2005	Pioneer Investments, Decision Support System for Long Term Pension Fund Management (continuation)	200,000
	Morgan Stanley, Individual Asset Liability Management (continuation)	250,000
	British Gas Group, LNG Delivery Evaluation	30,000
2006	Pioneer Investments, Decision Support System for Long Term Pension Fund Management (continuation)	80,000
	Morgan Stanley, Individual Asset Liability Management (continuation)	250,000
2007	British Gas Group, LNG Delivery Evaluation (continuation)	15,000
	Pioneer Investments, Decision Support System for Long Term Pension Fund Management (continuation)	80,000
	Banquo Credit Management, Credit Risk Management	20,000
2007-09	Orbis Investment Advisory, Systematic Long-Short Equity Strategy	300,000
2007-	Confidential Toxic OTC Derivative Valuations for EU and UK Law Firms	N/A
2009	Anglo American PLC, Long and Short Term Copper Price Forecasting	90,000
2009	Edwin Coe LLP, Report on Madoff Securities	10,000
2012-2016	EU 7th Framework, HPC Finance Marie Curie € 4 M Project	400,000
2013-2016	Russian Government, Laboratory for Quantitative Finance, Higher School of Economics, Moscow $ 4 M Grant	$ 200,000
2016	Hanover Square Capital, Collateralized Bond Flotation Design and Analysis	51,000
2017	Calfin International, Trading Collateralized Bond Flotation Analysis	54,000

SELECTED PUBLICATION LIST

Books

Introduction to Optimization Methods. London: Chapman and Hall (1974), 204 pp. (with P R Adby).

Stochastic Programming. London: Academic (1980), 573 pp. (Editor).

Analysis and Optimization of Stochastic Systems. Proceedings of the IMA International Conference, Oxford, September, 1978. London: Academic (1980), 573 pp. (Co-editor with M H A Davis, C J Harris, O L R Jacobs and P C Parks).

Large-Scale Linear Programming. Volumes I and II.IIASA Collaborative Paper Conference Proceedings Series No. 1.Laxenburg: IIASA (1981), 1133 pp. (Co-editor with G B Dantzig and M Kallio).

Deterministic and Stochastic Scheduling. NATO Advanced Study Institute Proceedings Series. Dordrecht: Reidel (1982), 419 pp. (Co-editor with J K Lenstra and A H G Rinnooy Kan) .

Proceedings of the IIASA Task Force Meeting on Stochastic Optimization. *Stochastics* Special Issue, **10.3-4** (1983), 147-314. (Guest editor) .

Mathematical Models in Economics. Oxford Mathematical Economics Seminar Twenty-fifth Anniversary Volume. Oxford: Oxford University Press(1990), 550 pp. (Contributor and Co-editor with M O L Bacharach and J L Enos).Downloadable at: www.cfr.statslab.cam.ac.uk/publications

Mathematics of Derivative Securities. Newton Institute Proceedings, Volume 15.Cambridge: Cambridge University Press (1997), 400pp. (Contributor and Co-editor with S R Pliska.)

Risk Management: Value at Risk and Beyond. Newton Institute Proceedings Series. Cambridge University Press (2002), 292pp (Contributor and Editor).

Quantitative Fund Management. London: Chapman and Hall CRC (2009), 467pp. (Contributor and Co-editor with G Mitra and G Pfug).

Stochastic Optimization Methods in Finance and Energy: New Financial Products and Energy market Strategies. New York: Springer (2011), 474pp. (Contributor and Co-editor with M Bertocchi and G Consigli).

The Euro in Danger: Reform and Reset. Cambridge, UK: Searching Finance (2012), 88pp. (with J S

Commodities. London: Chapman and Hall CRC (2016), 703 pp.(Co-editor with K Tang).

High Performance Computing in Finance. London: Chapman and Hall CRC (2018), 614pp. (Contributor and Co-editor with Y Kannainen, J Keane and E Vynckier).

Translations

Edited translation (from the Russian) of: VI Arkin and IV Evstigneev. *Stochastic Models of Control and Economic Dynamics*. Moscow: Nauka (1979). Economic Theory Series, K Shell, ed. London and New York: Academic (1987), 208 pp. (with E A Medova).

Edited translation (from the Russian) of: E L Presman and I M Sonin. *Sequential Control with Incomplete Information: The Bayesian Approach to Multi-armed Bandit Problems*. Moscow: Nauka (1982). Economic Theory Series, K Shell, ed. London and New York: Academic (1990), 266 pp. (with E A Medova).

Major Works in Preparation

Real Asset Management: An Asset Pricing Approach to Real Options for Real People. Chichester: Wiley (with D G Laughton).

Optimization of Stochastic Systems. Research Monograph. Oxford University Press.

Political Economy of Public Expenditure. Oxford University Press (with O A Davis and A Wildavsky).

Introduction to Optimization Methods. London: Chapman and Hall. (Second edition to include new material on algorithms for nondifferentiable and global optimization.)

Applied Probability in Operations Analysis. Oxford University Press.

Linear Econometric Models. Oxford University Press.

Elements of Optimization. London: Chapman and Hall.

Articles

Stabilizing implementable decisions in dynamic stochastic programming. In: *Optimal Financial Decision Making Under Uncertainty*, G Consigli, D Kuhn & P Brandimarte, eds. International Series in Operations Research and Management Science, New York: Springer Verlag (2017)177-200 (with E A Medova and Y S Yong).

Life cycle goal achievement or portfolio volatility reduction? *Journal of Portfolio Management* **42.1** (2016) 99-117 (with Dwayne Kloppers, Elena Medova, Igor Osmolovskiy and Philipp Ustinov).

Review of *Bankers' New Clothes, What's Wrong with Banking and What to Do About It*, by Anat Amati and Martin Hellwig. *Quantitative Finance* **15.4** (2015) 579-582.

Developing a practical yield curve model: An odyssey. In: *New Developments in Macro-Finance Yield Curves*, J Chadha, A Durre, M Joyce & L Sarnio, eds., Cambridge University Press (2014), 251-290 (with J Evans and E A Medova).

Determinants of oil futures prices and convenience yields. *Quantitative Finance.***12.12(**2012), 1795-1809 (with E A Medova and K Tang).

Comparison of sampling methods for dynamic stochastic programming. Chapter 16 in *Stochastic Optimization Methods in Finance and Energy*, op. cit. (2011), 389-425 (with E A Medova and Y S Yong).

Asset liability management for individual households. *British Actuarial Journal* **16.2** (2011), with discussion, 405-464 (with E A Medova).

Wavelet optimized valuation of financial derivatives. *International Journal of Theoretical and Applied Finance*.**14.7** (2011) 1113-1137 (with B Carton de Wiart).

Regulating complex derivatives: Can the opaque be made transparent? *Journal of Banking Regulation***12.4** (2011) 308-330 (with E A Medova and J F Roberts).

Planning for retirement: Asset liability management for individuals. In: *Asset Liability Management Handbook*, G Mitra and K Schwaiger, eds. London: Palgrave Macmillan (2011) 409-432 (with E A Medova).

Estimating exponential affine models with correlated measurement errors: Applications to fixed income and commodities. *Journal of Banking and Finance* **35.3** (2011) 639-652 (with K Tang).

Growing wealth with fixed mix strategies. In: *The Kelly Capital Growth Investment Criterion*, L C MacLean, E O Thorpe and W T Ziemba, eds. Singapore: World Scientific (2011) 427-458 (with I V Evstigneev and K R Schenk-Hoppé).

Benoit B Mandelbrot (1924-2010): A father of Quantitative Finance. *Quantitative Finance* **11.2** (2011) 155-156.

Long-term interest rates and consol bond valuation. *Journal of Asset Management* **11.2-3** (2010)113-135 (with E A Medova and M Villaverde).

Long term spread option valuation and hedging. *Journal of Banking and Finance* **33.2** (2008) 2530-2540 (with E A Medova and K Tang).

Risk profiling defined benefit pension schemes. *Journal of Portfolio Management* **35.1** (2009) 76-93 (with M Germano, E A Medova, J K Murphy, D Ryan and F Sandrini).

Financial markets: The joy of volatility. *Quantitative Finance* **8.1** (2008) 1-3 (with I V Evstigneev and K R Schenk-Hoppé).

D C pension fund benchmarking with fixed-mix portfolio optimization. *Quantitative Finance* **7.4** (2007) 365-370 (with M Germano, E A Medova, M I Rietbergen, F Sandrini, M Scrowston and N Zhang).

Empirical copulas for CDO tranche pricing using relative entropy. *International Journal of Theoretical and Applied Finance* **10.4** (2007) 679-702 (with E A Medova and S W Yang).

Designing minimum guarantee funds. *Quantitative Finance* **7.2** (2007) 245-256 (with M Germano, E A Medova, M I Rietbergen, F Sandrini and M Scrowston).

Volatility-induced financial growth. *Quantitative Finance* **7.2** (2007) 151-160 (with I V Evstigneev and K R Schenk-Hoppé).

Asset pricing and hedging in financial markets with transaction costs: An approach based on the von Neumann-Gale model. *Annals of Finance* **2.2** (2006) 327-355 (with I V Evstigneev and M I Taksar).

On macroeconomics: Comparative statics. In: *Mathematical Models in Economics*. M O L Bacharach, M A H Dempster and J L Enos (eds.) Oxford: Oxford University Press (1990), Chapter 9 (with O A Davis), *op.cit.*

A model of optimal development for an under-employed economy. In: *Mathematical Models in Economics*. M O L Bacharach, M A H Dempster and J L Enos (eds.) Oxford: Oxford University Press (1990), Chapter 19 (with J L Enos), *op. cit.*

Sequential importance sampling algorithms for dynamic stochastic programming. *Journal of Mathematical Sciences* **133.4** (2006) 1422-1444.

An automated FX trading system using adaptive reinforcement learning. Special Issue on Financial Engineering, *Expert Systems with Applications* **30** (2006) 543-552 (with V Leemans).

Managing Guarantees. *Journal of Portfolio Management*, **32.2** (2006) 51-61 (with M Germano, E A Medova, M I Rietbergen, F Sandrini and M Scrowston).

Stochastic modelling and optimization using STOCHASTICS™. In S W Wallace and W T Ziemba (eds.) *Applications of Stochastic Programming.* MPS-SIAM Series in Optimization (2005) 131-150 (with J E Scott and G W P Thompson).

Sequential importance sampling for dynamic stochastic programming. *Transactions of the St Petersburg Steklov Mathematical Institute* **312** (2004) 94-129.

Adaptive systems for foreign exchange trading. *Eclectic* **18** Autumn (2004) 21-26 (with M P Austin, R G Bates, V Leemans and S N Williams).

Adaptive systems for foreign exchange trading. *Quantitative Finance* **4.4** (2004), c37-45 (with M P Austin, R G Bates, V Leemans and S N Williams).

Evolutionary reinforcement learning in FX order book and order flow analysis. In IEEE Neural Networks Council Staff (eds.) *Proceedings of the International Conference on Computational Intelligence for Financial Engineering (CIFEr*), 21-23 March 2003, Hong Kong. Piscataway N J: IEEE Standards Office (2003) 355-362 (with R G Bates and Y S Romahi).

Structured products for pension funds. In K Marti, Y Ermoliev and G Pflug (eds.) *Dynamic stochastic optimization.* Berlin: Springer Verlag, (2004) 115-130 (with M Germano, E A Medova and M Villaverde).

Exponential growth of fixed-mix strategies in stationary asset markets. *Finance and Stochastics **7*** 263-276 (with I V Evstigneev and K R Schenk-Hoppe).

Global asset liability management. *British Actuarial Journal **9*** (2003) 137-216 (with M Germano, E A Medova and M Villaverde).

Intraday FX trading: an evolutionary reinforcement learning approach. In H Yin et al (eds.) *Intelligent Data Engineering and Automated Learning*. Proceedings of the IDEAL 2002 International Conference (3rd), 12-14 August 2002, Manchester, England. Berlin: Springer Verlag (2002) 347-358 (with Y Romahi).

Spread option valuation and the fast Fourier transform. In: *Proceedings of the 1st World Congress of the Bachelier Finance Society*. H Géman, D Madan and S R Pliska (eds.) Berlin: Springer (2002) 203-220 (with S S G Hong).

Dynamic portfolio replication using stochastic programming. In: Dempster (2002) *op cit*, pp 100-128 (with G W P Thompson).

Introduction. In: *Risk Management: Value at Risk and Beyond*. M A H Dempster (ed.) Cambridge: Cambridge University Press (2002) ix-xiv.

Wavelet based PDE valuation of derivatives. *Proceedings of the Third European Congress of Mathematics*. Rodriguez et al (eds.) Progress in Mathematics Series. Basel: Birkhauser (2001) 347-365 (with A Eswaran).

Computational learning techniques for intraday FX trading using popular technical indicators *IEEE Transactions on Neural Networks*, **12.4** (2001) 744-754 (with T Payne, Y Romahi and G W P Thompson).

A real-time adaptive trading system using genetic programming. *Quantitative Finance* **1.4** (2001) 397-413 (with C M Jones).

Wavelet methods in PDE valuation of financial derivatives. In K S Leung, L-W Chan and H Meng (eds.*) Data Mining, Financial Engineering, and Intelligent Agents: Intelligent Data Engineering and Automated Learning - IDEAL 2000 International Conference (2nd).* N T Shatin, Hong Kong, China, 13-15 December (2000) 215-238 (with A Eswaran and D G Richards).

Planning logistics operations in the oil industry. *Journal of the Operational Research Society* **51.11** (2000) 1271-1288 (with N Hicks Pedrón, E A Medova, J E Scott and A Sembos).

Pricing American options fitting the smile. *Mathematical Finance* **10** (2000) 157-177 (with D G Richards).

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