Michail Chronopoulos

Contact Information

City, University of London
Cass Business School
Faculty of Actuarial Science & Insurance
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Education

University College London, London, UK

PhD, Statistics, August 2011

- Dissertation Topic: "Investment decision making under uncertainty: the impact of risk aversion, operational flexibility, and competition"
- Primary Supervisor: Afzal Siddiqui
- Subsidiary Supervisor: Bert De Reyck

Western Michigan University, Kalamazoo MI, USA

MSc, Statistics, April 2007

University of Ioannina, Ioannina, Greece

BSc, Mathematics, April 2005

Research Interests

Mathematical Finance, Industrial Economics & Engineering, Management Science, Operational Research, Real Options, Game Theory, Statistics, Machine Learning, Energy Economics

Teaching Qualifications

University of Brighton, Brighton, UK

PGCert Learning and Teaching in Higher Education, June 2018

Professional Memberships

Institute and Faculty of Actuaries (IFoA), Higher Education Academy

Current Employment

City, University London, London, UK — **September 2018 – Present**

Senior Lecturer in Actuarial Science, Cass Business School

Norwegian School of Economics, Bergen, Norway — **September 2015 – Present**

Adj. Associate Professor in Management Science, Department of Business & Management Science

Previous Employment

University of Brighton, Brighton, UK — **September 2015 – August 2018**

Senior Lecturer in Mathematical Sciences, Department of Computing Engineering & Mathematics

Norwegian School of Economics, Bergen, Norway — **September 2012 – August 2015**

Assistant Professor in Management Science, Department of Business & Management Science

London Business School, London, UK — **August 2011 – August 2012**

Research Fellow, Management Science & Operations Subject Area

University College London, London, UK — **August 2011 – August 2012**

Research Associate in Energy Policy, Department of Management Science & Innovation

SELECTED PUBLICATIONS

Chronopoulos, M, E Panaousis & J Grossklags (2018), "An Options Approach to Cybersecurity Investment," *IEEE Access*, 6(1): 12175–12186. [Impact Factor: 3.244, Scimago Journal and Country Rank: Quartile 1] **(5 citations)**

Chronopoulos, M, V Hagspiel & SE Fleten (2017), "Stepwise Investment and Capacity Sizing under Uncertainty," *OR Spectrum*, 39(2): 447–472. [Impact Factor: 1.557, Scimago Journal and Country Rank: Quartile 1, ABS: Level 3] **(4 citation)**

Chronopoulos, M & S Lumbreras (2017), "Optimal Regime Switching under Risk Aversion and Uncertainty," *European Journal of Operational Research*, 256(2): 543–555. [Impact Factor: 3.297, Scimago Journal and Country Rank: Quartile 1, ABS: Level 4] **(9 citations)**

Blyth, W, D Bunn, M Chronopoulos & J Munoz (2016), "Systematic Analysis of the Evolution of Electricity and Carbon Markets under Deep Decarbonisation," *Journal of Energy Markets*, 9(3): 59–94. **(1 citations)**

Lumbreras, S, DW Bunn, A Ramos & M Chronopoulos (2016), "Real Options Valuation Applied to Dynamic Transmission Expansion Planning," *Quantitative Finance*, 16(2): 231–246. [Impact Factor: 0.608, Scimago Journal and Country Rank: Quartile 1, ABS: Level 3]

Chronopoulos, M, V Hagspiel, & SE Fleten (2016), "Stepwise Green Investment under Policy Uncertainty," *The Energy Journal*, 35(4): 87–108. [Impact Factor: 2.466, Scimago Journal and Country Rank: Quartile 1]

Chronopoulos, M & A Siddiqui (2015), "When is it Better to Wait for a New Version? Optimal Replacement of an Emerging Technology under Uncertainty," *Annals of Operations Research*, 235(1): 177–201. [Impact Factor: 1.709, Scimago Journal and Country Rank: Quartile 2, ABS: Level 3] **(5 citations)**

Chronopoulos, M, B De Reyck & A Siddiqui (2014), "Duopolistic Competition under Risk Aversion and Uncertainty," *European Journal of Operational Research*, 236(2): 643–656. [Impact Factor: 3.297, Scimago Journal and Country Rank: Quartile 1, ABS: Level 4] **(8 citations)**

Chronopoulos, M, DW Bunn, & A Siddiqui (2014), "Optionality and Policymaking in Re-Transforming the British Power Market," *Economics of Energy & Environmental Policy*, 3(2). **(4 citations)**

Chronopoulos, M, B De Reyck & A Siddiqui (2013), "The Value of Capacity Sizing under Risk Aversion and Operational Flexibility," *IEEE Transactions on Engineering Management*, 60(2): 272–288. [Impact Factor: 1.188, Scimago Journal and Country Rank: Quartile 2, ABS: Level 3] **(12 citations)**

Chronopoulos, M, B De Reyck & A Siddiqui (2011), "Optimal Investment under Operational Flexibility, Risk Aversion, and Uncertainty," *European Journal of Operational Research*, 213(1): 221–237. [Impact Factor: 3.297, Scimago Journal and Country Rank: Quartile 1, ABS: Level 4] **(41 citations)**

Chronopoulos, M, B De Reyck & A Siddiqui (2009), "Optimal Investment and Operational Decision-Making under Risk Aversion and Uncertainty," Conference Proceedings, INFORMS MSOM and SIG Meetings, Cambridge, MA, USA (28-30 June 2009).

SUBMITTED PAPERS

Sendstad, HL & M Chronopoulos, "Sequential Investment in Emerging Technologies under Policy Uncertainty," http://ssrn.com/abstract=2795475, under review.

Sendstad, HL & M Chronopoulos, "Strategic Technology Switching Under Risk Aversion and Uncertainty," http://ssrn.com/abstract=3035827, under review.

Chronopoulos, M, "The Value of Modular Design and Project Scale for Alternative Green Investment," under review.

Selected Working Papers

Sendstad, HL & M Chronopoulos, "Optimal Risk Adoption and Capacity Investment in Disruptive Innovations".

Sendstad, HL & M Chronopoulos, "Empirical Option Pricing under Regime Switching and Stochastic Transition Probabilities".

Chronopoulos, M, "The Impact of Managerial Discretion on Credit Risk and Optimal Capital Structure".

Chronopoulos, M, "Risk Measures for the Real Options Investment Problem".

Research Grants

Norwegian Research Council (£**60,000**)
The Finance Market Fund (Financemarked) ES572256

Strategic Risk Adoption in Real Options under Multi-Horizon Regime Switching and Uncertainty.

prepared jointly with

- Yushu Li, University of Bergen, Norway
- Jan Bulla, University of Bergen, Norway
- Ramazan Gençay, Simon Fraser University, Canada
- Fredrik NG Andersson, Lund University, Sweden

European Commission (£**7,476,908.75**)
Horizon 2020 H2020-SU-DS-2018

SPIDER (833685): *A 5G domain-specific cyber range platform for cybersecurity simulation, training and economics.*

Applications in Progress

1. EPSRC

   An Options Analysis of the Implications of Macroeconomic Uncertainty and Agency Costs for Credit Risk and Social Welfare.

2. NERC

   Agent-Based Modulated Complementarity Modelling of Electricity Capacity Expansion.

Teaching

City, University of London, London, UK — **September 2018 – Present**

Level 5	AS2204 Stochastic Modelling

University of Brighton, Brighton, UK — **September 2015 – August 2018**

Level 4	MM151 Mathematical and Professional Skills MM402 Core Mathematics 2
Level 5	MM255 Mathematical Methods MM505 Operational Research MM510 Statistics 2
Level 6	MM341 Advanced Operational Research MM345 The Mathematics of Finance
Level 3	FY001 Core Mathematics (Engineering)
Level 4	XE220 Mathematics and Control (Engineering)

Norwegian School of Economics, Bergen, Norway **September 2012 – August 2015**

Lecturer

ENE422: Financial Aspects of Energy and Commodity Markets, taught at the level of Hull (2012), *Options, Futures and other Derivatives*, 7th Edition, Prentice-Hall.

University College London, London, UK **September 2008 – June 2010**

Teaching Assistant

ECON2601: Economics II, taught at the level of Varian (1992), i.e., the MSc version of the textbook, and Mankiw, NG (2003), Macroeconomics, 5th Edition.

Western Michigan University, Kalamazoo MI, USA **September 2005 – May 2007**

Teaching Assistant

STAT216: Business Statistics
STAT160: Statistics and Data Analysis

Supervising

PhD

2018–Present	Kimiya Oshikoji, Doctoral Research Associate
2014–2018	Lars Hegnes Sendstad, Doctoral Research Associate

MSc Projects

2015–2016	Alexander Alm Gabrielle Lattanzio Joachim Hansteen and Gjermund Larsen Kim Oshikoji
2014–2015	Mats Abelsen and Stig Nystad Ole Randa Baek Ahyoung Magnus Torgersen and Jone Helland Trine Tjetland and Martine Larsen
2013–2014	Yi Zhou Ole Christian Sand Anastasia Ushakova

Administrative Experience

2015–Present	Participation in the design of foundation year and MMath programmes Leadership and design of Level 4, 5 and 6 courses Moderation and design of paper- and computer-based assessments Design of descriptors for new courses Recruitment of students and staff members Participation in the 2016 periodic review Design of Actuarial Sciences courses Serve as an admissions and personal tutor Member of Mitigating Circumstances Committee
2012–2015	Leadership and design of a Level 7 course: "Financial Aspects of Energy and Commodity Markets"
2011–2012	Participation in the preparation of Modelling and Managing Electricity Markets (MMEM) workshop provided by the Energy Market Group (EMG) at LBS

Workshops

Michail Chronopoulos and Gunnar S. Eskeland, "The Value of Better Wind Information in Investment Decisions" in Intermittent Renewables, Balancing Power and Electricity Market Design, Hardingasete, Norway (25–27 August 2014).

Modelling and Managing Electricity Markets, London Business School, 23 April 2012 London UK
The workshop presents the latest techniques for price risk modelling, under the current challenges of technology mix, intermittency and market structure changes, as well as the effects of various regulatory interventions and policies

Conference Presentations

Lars H Sendstad & Michail Chronopoulos, "The Value of Turning-Point Detection for Optimal Investment," in the Annual meeting of the Institute of Operations Research and Management Science (INFORMS), Phoenix, AZ, USA (4–7 November 2018).

Michail Chronopoulos, "The Value of Modular Design and Project Scale for Alternative Green Investment," in the 41st IAEE International Conference, Groningen, the Netherlands (10–13 June 2018).

Lars H Sendstad & Michail Chronopoulos, "Optimal Risk Adoption and Capacity Investment in Disruptive Innovations," in the 41st IAEE International Conference, Groningen, the Netherlands (10–13 June 2018).

Michail Chronopoulos, "The Value of Modular Design and Project Scale for Alternative Green Investment," in the 5th International Conference on Energy Sustainability and Climate Change, Mykonos, Greece (4–6 June 2018).

Lars H Sendstad & Michail Chronopoulos, "Sequential Innovation Investment and Technology Switching under Rivalry and Uncertainty," in the 34th FIBE Conference, Bergen, Norway (5–6 January 2017).

Lars H Sendstad & Michail Chronopoulos, "Sequential Innovation Investment and Technology Switching under Rivalry and Uncertainty," in the 20th Annual International Real Options Conference, Bergen, Norway (15–18 June 2016).

Lars H Sendstad & Michail Chronopoulos, "Sequential Investment in Emerging Technologies under Risk Aversion and Policy Uncertainty," in the 33rd FIBE Conference, Bergen, Norway (7–8 January 2016).

Lars H Sendstad & Michail Chronopoulos, "Sequential Investment in Emerging Technologies under Risk Aversion and Policy Uncertainty," in the 19th Annual International Real Options Conference, Athens, Greece (17–20 June 2015).

Michail Chronopoulos & Sara Lumbreras, "Optimal Regime Switching under Risk Aversion and Uncertainty," in the 19th Annual International Real Options Conference, Athens, Greece (17–20 June 2015).

Michail Chronopoulos, Verena Hagspiel, & Stein–Erik Fleten, "Stepwise Green Investment under Policy Uncertainty" in the 32nd FIBE Conference, Bergen, Norway (8–9 January 2015).

Michail Chronopoulos, Verena Hagspiel, & Stein–Erik Fleten, "Stepwise Green Investment under Policy Uncertainty" in the Annual meeting of the Institute of Operations Research and Management Science (INFORMS), San Fransisco, CA, USA (9–12 November 2014).

Michail Chronopoulos & Gunnar S Eskeland, "The Value of Wind Information in Investment Decisions" in IAEE 2014, Rome, Italy (28–31 October 2014).

Michail Chronopoulos & Afzal Siddiqui, "When is it Better to Wait for a New Version? Optimal Replacement of an Emerging Technology under Uncertainty" in the 31st FIBE Conference, Bergen, Norway (9–10 January 2014).

Michail Chronopoulos & Afzal Siddiqui, "Optimal Replacement of a Renewable Energy Technology under Uncertainty" in Annual meeting of the Institute of Operations Research and Management Science (INFORMS), Minneapolis, MN, USA (9–10 October 2013).

Derek Bunn, Michail Chronopoulos, Bert De Reyck, & Afzal Siddiqui, "Generation Capacity Expansion in Electricity Markets under Rivalry and Uncertainty," in Annual meeting of the Institute of Operations Research and Management Science (INFORMS), Phoenix, AZ, (14–17 October 2012).

Michail Chronopoulos, Derek Bunn, & Afzal Siddiqui, "An Options Approach to UK Energy Futures" in 35th IAEE International Conference, Perth, Australia (27 June 2012).

Michail Chronopoulos, Derek Bunn, & Afzal Siddiqui, "An Options Approach to UK Energy Futures" in UKERC Annual Assembly 2012, Warwick, UK (20–22 June 2012).

Derek Bunn, Michail Chronopoulos, Bert De Reyck, & Afzal Siddiqui, "Generation Capacity Expansion in Electricity Markets under Rivalry and Uncertainty," in 16th Annual International Real Options Conference, London, UK (27–30 June 2012).

Derek Bunn, Michail Chronopoulos, Bert De Reyck, & Afzal Siddiqui, "Generation Capacity Expansion in Electricity Markets under Rivalry and Uncertainty," in Computational Management Science Conference, London, UK (18–20 April 2012).

Michail Chronopoulos & Afzal Siddiqui, "Scaling the Capacity Size of the Investment Project under Uncertainty and Risk Aversion," in Annual meeting of the Institute of Operations Research and Management Science (INFORMS), Austin, TX, USA (7–10 November 2010).

Michail Chronopoulos, Bert De Reyck, & Afzal Siddiqui, "Scaling the Capacity Size of the Investment Project under Uncertainty and Risk Aversion," in Doctoral Candidates Colloquium part of the 27th FIBE Conference, Bergen, Norway (7–10 January 2010).

Michail Chronopoulos, Bert De Reyck, & Afzal Siddiqui, "On the Impact of Operational Flexibility and Risk Aversion on Optimal Investment under Uncertainty" in Annual conference of Manufacturing and Service Operations Management (MSOM) and the Special Interest Group (SIG) meetings, Boston, MA, USA (28–30 June 2009).

Invited Seminars

Sequential Innovation Investment and Technology Switching under Rivalry and Uncertainty, in the Departmental Seminar at Geilo, Norway (22–24 March 2017).

Optimal Regime Switching under Risk Aversion and Uncertainty, University of Bergen, Bergen, Norway, (5 January 2017).

Financial Management of Engineering Projects, London South Bank University, London, UK, (24-28 October 2016).

When is it Better to Wait for a New Version? Optimal Replacement of an Emerging Technology under Uncertainty, Athens University of Economics and Business, Athens, Greece, (12 May 2014).

Departmental seminar on the first and second chapter of the thesis. University College London, London, UK, (29 October 2009 and 20 October 2010).

Honors and Awards

- **Finalist of the INFORMS Student Paper Travel Award (31 August 2010)**
  An award of the Energy, Natural Resources and Environment Section given annually to the best paper dealing with energy, environmental or natural resource issues by a student author who is presenting at the INFORMS Annual Meeting, as judged by a panel of the Energy and Natural Resources and the Environment Section.

- **Costas Goutis Prize (January 2009)**
  Awarded by the Department of Statistical Science for student excellence.

Enabling Activities

Chair of session "Real Options," FIBE 2017, Bergen, Norway (5–7 January 2017).

Chair of session "Finance II," FIBE 2015, Bergen, Norway (8–9 January 2015).

Chair of session "Optimal Resource Management," 16th Annual International Real Options Conference, London, UK (27 – 29 June 2012).

Chair of session "Energy and Natural Resources," FIBE 2013, Bergen, Norway (9–10 January 2014).

Referee Service

Journal of Economic Dynamics and Control
European Journal of Operational Research
International Journal of Production Economics
IEEE Transactions on Engineering Management
IEEE Transactions on Smart Grid
Journal of Energy Engineering
Annals of Operational Research
Energy Economics
Energy Policy
Energy Systems
Omega

Referees

- Derek Bunn, London Business School, Management Science and Operations Subject Area, London NW1 4SA, UK.
- Bert De Reyck, University College London, School of Management, London, WC1E 6BT, UK
- Afzal Siddiqui, University College London, Department of Statistics, London, WC1E 6BT, UK

Computer Skills

Operating Systems	Windows, Linux
Optimisation	Matlab, Python, Excel VBA, Palisade Decision Tools, GAMS
Object-Oriented Programming	*C#*, C++
Web Development	HTML, ASP.NET
Statistics	SAS, R, Minitab
Typography	Latex

Software Apps & Web Design

Development and implementation of financial and decision-making models based on real options, embedded in dynamic websites using Python, R, and *C#*.

Languages

Greek	Native	
English	Fluent	*Cambridge English: Proficiency (CPE)*
Norwegian	Advanced	
German	Advanced	*Zentrale Mittelstufenprüfung (ZMP)*