

William S. W. Chung

A. EDUCATION

Doctor of Philosophy in Management Sciences (Ph.D.),

Department of Management Sciences, Faculty of Engineering, University of Waterloo, Canada
Dissertation Topic: New Decomposition Methods for Economic Equilibrium Models with
Applications to Decomposition by Region

Master of Applied Science in Management Sciences (M.A.Sc.),

Department of Management Sciences, Faculty of Engineering, University of Waterloo, Canada

Bachelor of Engineering in Industrial Engineering (B.Eng.),

School of Industrial Engineering, Ryerson University, Canada

B. ACADEMIC EXPERIENCE

2007 – present **Associate Professor**

Department of Management Sciences, Faculty of Business
City University of Hong Kong, Hong Kong

2000 – 2007 **Assistant Professor**

Department of Management Sciences, Faculty of Business
City University of Hong Kong, Hong Kong

1999 – 2000 **Postdoc of NSERC Strategic Research Grant Project**

Department of Management Sciences, University of Waterloo

- Greenhouse Gas Control in Canada: Advanced Bottom-up Modeling for Long-term Analysis, **funded by NSERC of Canada.**

C. REFEREED ACADEMIC PUBLICATIONS

Articles in Refereed Journals

Chung, W. (2011) Variational Inequality Formulations for Oligopolistic Electricity Models with Marketable CO₂ Emission Permits, in *Handbook of Power Systems: CO₂*, edited by Steffen Rehennack, Panos M. Pardalos, Mario V. Pereira, Niko A. Iliadis and Qipeng P. Zheng Springer. **(Invited by Pardalos, accepted)**

Chung, W. (2011) Dantzig-Wolfe decomposition method. *Wiley Encyclopedia of Operations and Research and Management Science, 8 Volume Set*. Edited by James J. Cochran, Louis Anthony Cox, Jr., Pinar Keskinocak, Jeffrey P. Kharoufeh, J. Cole Smith, March 2011, Wiley. **(Invited)**

Chung, W., Ip, C. Y., Kam, M. S. (2011) A study of residential energy use in Hong Kong by decomposition analysis, 1990 – 2007, *Applied Energy* 88:5180–5187.

Chung, W., Ng, T. W. (2011) Strategies of the toy manufacturers in the Pearl River Delta area: From OEM to OBM, *Interdisciplinary journal of contemporary research in business* 3(3):50-64.

Chung, W. (2011) Review of building energy use performance benchmarking methodologies. *Applied Energy* 88(5):1470-1479. **(Invited)**

*Chung, W., Fuller, J.D. (2010) Subproblem approximation in Dantzig-Wolfe decomposition of variational inequality models with an application to a multicommodity economic equilibrium model. *Operations Research* 58:1318-1327.

Chung, W., Hui, Y.V. (2009). A study of energy efficiency of private office buildings in Hong Kong. *Energy and Buildings* 41:696-701.

Ng, T. W., Chung, W. (2008) The Roles of Distributor in the Supply Chain – Push-pull Boundary, *International Journal of Business and Management*. 3:28-39.

Chung, W., Ng, T. W. (2008) A Study of How Distributors Provide Postponement Services in the Supply Chain, *International Review of Business of Research Papers*. 4:92-101.

Fuller, J. D., Chung, W. (2008) Benders Decomposition for a Class of Variational Inequalities, *European Journal of Operational Research*. 185:79-91.

Chung, W., Fuller, J.D., Wu, Y.J. (2006) A New Decomposition Method for Multiregional Economic Equilibrium Models. *Operations Research*, 54:643-655.

Chung, W., Hui, Y.V., Lam Y.M. (2006) Benchmarking the energy efficiency of commercial buildings. *Applied Energy*, 83:1-14.

Fuller, J.D., Chung, W. (2005) Dantzig-Wolfe Decomposition of Variational Inequalities. *Computational Economics*, 25:303-326.

Chung, W., Fuller, J.D., Wu, Y.J. (2003) A New Demand-Supply Decomposition Method for A Class of Economic Equilibrium Models. *Computational Economics*, 21:231-243.

Chung, W. (2002) WWW-WATEMS-GDL: An Internet Modeling System for Energy Policy Models. *Energy*. 27:569-577.

Wu, Y.J, and Chung, W., Fuller, J.D. (2000) Decomposing Multi-regional Dynamic Energy Process Models, *Applied Energy*, 66:225-235.

Chung, W., Wu, Y.J., and Fuller, J.D. (1997) Dynamic Energy and Environment Equilibrium Model for the Assessment of CO₂ Emission Control in Canada and the USA. *Energy Economic*, 19:103-124.

Wu, Y.J., Chung, W. (1997) Assessing the Control of Energy-related CO₂ Emissions with a Dynamic Energy Process Model. *Energy*, 22:693-704.

Articles in Lecture Note – full paper refereed

Zhu, W., Chung, W. (2008). Integrating markdown policy in aggregate production planning environment by developing an APP-MP model. *Lecture Notes in Management Science-Tadbir Institute for Operational Research*, Vol. 1, pp 100-119.

Articles in conference proceedings – full paper refereed

Chung, W., Kam, M. S., Fong, R. (2011). Decomposition analysis of Hong Kong residential energy use: 1990-2007. *Proceedings of the Symposium on Electrical and Mechanical Safety & Energy Efficiency - Engineering a Safe and Low-carbon Environment*, 24 - 25 January, Hong Kong. **(Invited)**

Chung, W. (2010). An oligopolistic electricity model with marketable CO2 emission permits. *Proceedings of The IEEM International Conference on Industrial Engineering and Engineering Management*, 7-10 December, Macau.

Chung, W., Zhu, W. (2008). A study of markdown policy in aggregate production planning environment by developing an APP-MP Model. *Proceedings of The IEEM International Conference on Industrial Engineering and Engineering Management*, 8-11 December, Singapore, pp 1133 – 1137.

Zhu, W., Chung, W. (2008). A linkage of markdown pricing with aggregate production planning. *Proceedings of 2008 IEEE International Conference on Service Operations and Logistics, and Informatics*. 12-15 October, Beijing, China, pp 1839 – 1844.

Zhu, W., Chung, W. (2008). Examine the significance of collaboration between the retailer and the manufacturer by developing an Aggregate Production Planning-Double Markdown Pricing model. *Proceedings of The Second International Conference on Operations and Supply Chain Management*. Taipei, July 29 – August 2, 2008, pp 393-401.

Chung, W. (2007). A General Method to Apply Dantzig-Wolfe Decomposition for Variational Inequalities with Affine Constraints, *Proceedings of The IEEE International Conference on Industrial Engineering and Engineering Management 2007*, Singapore, 2-5 December 2007, 898-902. [SCI]

Chung, W. (2005). Solving Semi-asymmetric Traffic Assignment Problems with Dantzig-Wolfe Decomposition Method, *Proceedings of the 10th International Conference of Hong Kong Society for Transportation Studies*, Hong Kong, 10 December 2005:249-258.

Wu, Y.J., Hung, J., Chung, W., Lan, B. (2001) A Shell System for GDL Equilibrium Approach, *Proceedings of the International Conference on Industrial Engineering and Production Management*, IEPM'2001, Quebec, Canada, August 20-23, 2001, pp 203-209.

Chung, W. (2000) A Decomposition Method for Multi-Commodity Energy Equilibrium Models, *Proceedings of the Third Asia-Pacific Conference on Industrial Engineering and Management Systems*, APIEMS'2000, Hong Kong, December 20-22, 2000, pp 116-120.

Wu, Y.J. and Chung, W. (1998) A Multi-period Market Equilibrium Model with Geometric Distributed Lag Demand. *Proceedings of 3rd International Conference of Management*, Shanghai, July 25-28. 531-538.

Wu, Y.J. and Chung, W. (1998) Solution Technique for Multi-period Equilibrium Calculation, with Geometric Distributed Lag Demand. *Proceedings of 3rd International Conference of Management*, Shanghai, July 25-28. 608-617.

Chung, W., Fuller, J.D., and Wu, Y.J. (1998) Decomposition Method for Multi-regional Energy Equilibrium Models. *Proceedings on Symposium on Industrial Engineering and Management*, CSME FORUM, Toronto, May 19-22, 3: 178-184.

Chung, W., Wu, Y.J., and Fuller, J.D. (1996) A Dynamic Energy & Environment Modeling System. *Proceedings on Symposium on Energy Management*, CSME FORUM, Hamilton, May 7-9. 267-274.

Articles (invited) in conference proceedings – abstract refereed

Fuller, J.D., Chung, W. (2010) Improved Dantzig-Wolfe Decomposition of Variational Inequality Problems with an Application to a Multicommodity Energy Market Model, CORS/Optimization Days 2010 Joint Conference, Montreal, Canada, May 10-12.

Chung, W. (2009). Simplicial decomposition and Dantzig-Wolfe decomposition of a class of variational inequalities. CORS/INFORMS International Toronto 2009 Conference, 14-17 June, Toronto.

Chung, W. Fuller, J.D. (2007) A Decomposition Approach to Formulate Generalized Nash Equilibrium Models of Energy Markets, CORS 2007 – London, Ontario, Canada, May 13-16.

Fuller, J.D., Chung, W. (2006) Variational Inequality Formulations of Energy Market Models: A Decomposition Approach, INFORMS Annual Meeting 2006 – Pittsburgh, November 5-8.

Chung, W., Fuller, J.D. (2006), Decomposition Methods for Equilibrium Models, CORS/Optimization Days 2006 Joint Conference, Montreal, Canada, May 8-10.

Chung, W., Fuller, J.D. (2004) Dantzig-Wolfe Decomposition of a Class of Multi-commodity Economic Equilibrium Models, CORS/INFORMS International Meeting 2004, Banff, Canada, May 16-19, 2004.

Fuller, J.D., Chung, W. (2004) Benders Decomposition for Variational Inequality Problem, CORS/INFORMS International Meeting 2004, Banff, Canada, May 16-19, 2004.

Chung, W., (2001) A Method to Decompose Energy Models by Commodity. INFORMS International 2001 Hawaii, Maui, Hawaii, June 17-20, 2001.

Chung, W., Fuller, J.D., and Wu, Y.J. (1998) Decomposition of Multi-regional Market Equilibrium Models. INFORMS/CORS Montreal 1998 Conference, April 26-29.

Wu, Y.J., Chung, W. (1997) A Dynamic Energy Process Model for Assessing and Optimizing the Control of Energy-related CO₂ Emissions. CORS -- Optimization Day, Montreal, May 12-14.

Fuller, J.D., Chung, W., Wu, Y.J. (1996) A Dynamic Energy and Environment Process Model. INFORMS Atlanta, Nov. 3-6.

Articles in conference proceedings – abstract refereed

Chung, W., Ng, T. W. (2007) Push and Pull Boundaries of Supply Chains – a distributor's role, The Fifth International Conference on Supply Chain Management and Information Systems, Melbourne, Australia, 9-12 December.

Chung, W., Fuller, J.D. (2006) A study of Dantzig-Wolfe Decomposition for Asymmetric Traffic Assignment Problems, INFORMS International (Hong Kong) 2006, Hong Kong, June 25-28.

Chung, W. (2005) Applying Dantzig-Wolfe Decomposition to Solve Asymmetric Traffic Assignment Problems, European Applied Business Research Conference in Athens, Greece, June 13-17, 2005.

Chung, W. (2000) A Decomposition Method for A Decomposition Method for Multi-Commodity Energy Equilibrium Models, The Third Asia-Pacific Conference on Industrial Engineering and Management Systems, APIEMS'2000, Hong Kong, December 20-22, 2000.

Chung, W. (2000) A Decomposition Method for A Decomposition Method for Multi-Commodity Energy Equilibrium Models, The Third Asia-Pacific Conference on Industrial Engineering and Management Systems, APIEMS'2000, Hong Kong, December 20-22, 2000.

Chung, W., Fuller, J.D., and Wu, Y.J. (1999) A New Decomposition Method for Solving Economic Equilibrium Models. IFORS 99, Beijing, China, August 16-20.

Chung, W., Fuller, J.D., and Wu, Y.J. (1999) Using New Decomposition Methods for Energy Equilibrium Models. CORS 99, Windsor, Canada, June 7-9.

Wu, Y.J. and Chung, W. (1999) Decomposing Multi-regional Dynamic Energy Equilibrium Models. Optimization Day, Montreal, May 10-12.

Chung, W., Fuller, J.D., and Wu, Y.J. (1998) Using Decomposition Algorithms to Decompose Multi-regional Energy Equilibrium Models. The 7th annual SWORD day, University of Western Ontario, Oct. 3rd.

Wu, Y.J., Fuller, J.D., and Chung, W. (1996) A Dynamic Energy and Environment Process Model. INFORMS, Washington, May 5-8.

Chung, W., Wu, Y.J., and Fuller, J.D. (1995) A Dynamic Energy and Environment Equilibrium Model for Assessment of CO2 Emission Control in Canada and the USA. IFORS Special Conference, London, July 18-20.

Fuller, J.D., Wu, Y.J., and Chung, W. (1995) A Canada-USA Energy Model, for Assessment of CO2 Emission Controls. International Symposium on forecasting, Toronto, June 4-7.

Articles are in process

Chung, W., Fuller, J.D. (2011). Generalized Simplicial Decomposition Method for a Class Variational Inequalities.

Chung, W. (2011). Using Fuzzy Linear Regression Method for Benchmarking Energy Efficiency of Commercial Buildings.

Invited academic seminars

2011 Optimization and Equilibrium Models for Energy-Environmental Policy Analysis – A Review
Center for International Energy and Environment Strategy Studies, School of International Studies Executive Director, Renmin University of China, Beijing, China, May 5.

2003 A New Decomposition Method for Multi-regional Economic Equilibrium Models and Variational Inequalities Models
Laboratory of Management Decision & Information Systems, Chinese Academy of Sciences, Beijing, China, December 18.

D. PROFESSIONAL SERVICES TO ACADEMIA

Editorial board member, since

2011 International Journal of Data Analysis Techniques and Strategies

Invited Conference Committee, since

2008 Technical Program Committee (2008, 2009, 2010)
International Conference on Industrial Engineering and Engineering Management

Refereeing and Reviewing, since

2009 Energy Conversion & Management
2009 Energy & Buildings

2008 European Journal of Operational Research
 2007 Applied Energy
 2007 International Journal of Production Economics
 2003 Energy – The International Journal.

E. SERVICES AT UNIVERSITY

Director of Research Unit, since

2011 Director of Energy and Environmental Policy Research Unit

Faculty Committees

2006 – 2010 Member, Faculty Graduate Studies Committee
 2004 – 2008 Member, Business Faculty Board
 2003 – present Interviewer, Interview Panel for Student Exchange Program
 2002 Interviewer, Interview Panel for MBA intake
 2002 Interviewer, School Principle's Nominations

Department Committees

2007 – 2013 Advisory Committee for Department of Management Sciences
 2010 – 2011 Member, Departmental Staffing Committee
 2003 -- 2004 Selected member, Departmental Staffing Committee

Administrative Appointments

2001 – present Student Exchange Program Coordinator
 2004 – 2007 Program Leader of Master of Arts in Operations & Supply Chain Management
 2003 – present Qualifying Panel Member of research students (around 2 students a year)

F. GRADUATE SUPERVISION

Finished	Student's Name	Level	Status after graduated
2010 graduated	ZHU, Wenyun	M.Phil.	Got an offer from P&G, Managing Trainee (China)

On-going	Student's Name	Level
2011 -	ZHU, Wenyun	Ph.D.

G. TEACHING EXPERIENCE (City University of Hong Kong)

Graduate Courses:

MS 5221 Operations Modelling and Analysis I, MA in Quantitative Analysis for Business
 MS 5222 Business Scheduling, MA in Quantitative Analysis for Business
 MS 5721 Operations Management, MBA program
 MSV5721 Operations Management, Internet-based MBA (iMBA) course coordinator
 MS 5731 Quantitative Methods, MBA program
 MS 5731 Quantitative Methods, MSc in Finance & Banking
 MS 6221 Operations Modelling and Analysis II, MA in Quantitative Analysis for Business
 MS 6226 Operations Modelling and Analysis, MA in Quantitative Analysis for Business
 MS 6231 Master Project, MA in Quantitative Analysis for Business
 MS 6721 Supply Chain Management, MA in Quantitative Analysis for Business
 MS 6721 Supply Chain Management, MSc in Finance & Banking
 MSV 6726 Service Management, iMBA course coordinator
 FB 6812 Executive-MBA project, supervisor

Undergraduate Courses:

FB 2201 Management Sciences II, for BBA
MS 3106 Simulation, for BBA
MS 3303 Service Quality Management, BBA
MS 3121 Fundamental of Business Logistics Management, BBA
MS 4118 Management Sciences Project, BBA final year project supervisor

H. HONORS and AWARDS

- **Ontario Graduate Scholarship** (http://osap.gov.on.ca/not_secure/OGS.htm) from the Ontario Provincial Government, Canada. 1998-1999.
- **SSHRC Travel Grant** from *The 7th annual SWORD day*, 1999.
- **University of Waterloo Graduate Scholarship** from the University of Waterloo, Waterloo, Canada. Sept. 98, May 98, Sept. 97, May 97, Jan. 97, Sept. 96, Sept. 94.
- **Faculty of Engineering Graduate Scholarship** from the University of Waterloo, Waterloo, Canada. Jan. 95, Jan. 98.
- **Second Prize of Student's paper competition** from *The 7th annual SWORD day, 1998*
- **Dean's List** from Ryerson University, Toronto, Canada. 1991-1992.

I. RESEARCH GRANTS

2009-2012, Individual Principal Investigator, funded by CityU Strategic Research Grant, **City University of Hong Kong**.

2009-2011, Individual Principal Investigator, funded by RGC General Research Fund (GRF), **Hong Kong SAR, (successful rate 41%)**.

2008-2010, Individual Principal Investigator, funded by CityU Strategic Research Grant, **City University of Hong Kong**.

2006-2008, Individual Principal Investigator, funded by CityU Strategic Research Grant for fundable CERG (SRG-Fd), **City University of Hong Kong**.

2005-2008, Individual Principal Investigator, funded by RGC Competitive Earmarked Research Grant (CERG), **Hong Kong SAR, (successful rate 30%)**.

2004-2006, Individual Principal Investigator, funded by CityU Strategic Research Grant for fundable CERG (SRG-Fd), **City University of Hong Kong**.

2002-2005, Individual Principal Investigator, funded by RGC Competitive Earmarked Research Grant (CERG), **Hong Kong SAR, (successful rate 30%)**.

2001-2003, Individual Principal Investigator, funded by CityU Strategic Research Grant (SRG), **City University of Hong Kong**.

2001, Individual Principal Investigator, funded by CityU Small-scale Research Grant (SMA), **City University of Hong Kong**.

J. PROFESSIONAL SERVICES TO COMMUNITY

Consultancy projects:

- 2011 **Energy Modeling Consultant**
 Hong Kong Productivity Council
 Consultancy Assignment in developing a DEA model for energy-environmental policy analysis of green industrial park planning in China.
- 2010 – 2012 **Energy Policy Analyst and Consultant**
 Electrical and Mechanical Services Department , Hong Kong
 Consultancy Assignment on Energy Intensity Model for HKSAR-Electrical and Mechanical Services Department coordinated by HKPC.
 The project includes developing energy intensity model and conducting policy analyses in Hong Kong.
- 2003 – 2005 **Energy Policy Analyst and Consultant**
 Electrical and Mechanical Services Department, Hong Kong
 Sub-consultancy Study on Development of Energy Indicators and Benchmarks for Special Buildings (such as schools, hotels, hospitals).
- 2000 – 2002 **Energy Policy Analyst and Consultant**
 Electrical and Mechanical Services Department, Hong Kong
 Consultancy Study on the Development of Energy Consumption Indicators and Benchmarks for Selected Energy-consuming Groups in Hong Kong.

Feedbacks to consultancy document:

Chung, W. (2010), Feedbacks on the consultancy document for HK's climate change strategy and action agenda. <http://www.legco.gov.hk/yr10-11/english/panels/ea/papers/ea0429cb1-2022-5-e.pdf>

Articles in magazines:

Invited by “Recruit”, a famous magazine for job searching in Hong Kong

- 2008 April, Preventing warehouse from growing huge.
 2008 May, Products with short life cycle are more within reach.
 2008 June, Mass customization: Beauties of Mass Customization as seen in Wagon Noodles.
 2008 July, New Horizon for Customer Management as witnessed in Sushi Bar.
 2008 August, From no more leftover chicken policy in HK to newspaper stalls operations model.
 2008 September, Conveyor Belt Sushi Bar – Gems of Wisdom from Small Refrigerators.
 2008 October, Refund: is it the best recovery tactic of Campbell's canned soup?
 2008 November, 7-11 and Chinese restaurant: waiting and enjoyment.
 2009 January, Psychology and customers waiting.
 2009 February, Buy more for getting more discounts: Does the offer of more discounts for more purchases always bring a greater profit?
 2009 April, One-dollar strategy: Is the 'one-dollar' strategy always good for the copycat?
 2009 May, Go-round catalogue of products-wisdom of sushi house.
 2009 July, The 'Dim Sum' Trolley versus Order Sheet.
 2009 August, The Myth of JIT (not published).

Public seminars (Invited)

- 2010 Energy Supply & Demand in Hong Kong, 1990 – 2009, *WWF Energy Policy Forum*, Hong Kong, 18 November 2010.
- 2010 Changing Energy Mix: an approach for GHG reduction in HK, *WWF Climate Policy Forum Cum Workshops: GHG Reduction Solutions for a Low Carbon Hong Kong*, Hong Kong, 30 September 2010

Press Conference and records in Newspaper

2010 December 23

South China Morning Post: Climate change plans dismissed as unsound.

The Standard: Climate change energy estimates over the top, complain greens.