

Stefanos A. Zenios

Associate Professor of Operations, Information, and Technology,
Spence Faculty Scholar for 2004-05,
Graduate School of Business, Stanford University.
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Education

- B.A. Mathematics with Computer Science, First Class Honors, Trinity College, University of Cambridge, Cambridge, England, 1992.
- M.A. Trinity College, University of Cambridge, Cambridge, England, 1996.
- Ph.D. Operations Research, Massachusetts Institute of Technology, Cambridge, MA, 1996. Thesis Advisor: Lawrence M. Wein. Thesis Title: “Health Care Applications of Optimal Control Theory.”

Research Interests

- Incentives and Coordination in Decentralized Technological Systems.
- Operational Efficiency in Health Care Delivery Systems.

Areas of Expertise

- Mathematical and Stochastic Modeling
- Systems Simulation
- Dynamic and Stochastic Optimal Control
- Applied Statistics
- Dynamic Principal Agent Models
- Contract Theory

History of Academic Appointments

- Professor of Operations, Information, and Technology, Graduate School of Business, Stanford University, September 2005 -

- Associate Professor of Operations, Information, and Technology, Graduate School of Business, Stanford University, September 2000 - August 2005 (with tenure since Sept 2003).
- Visiting Associate Professor of Decision Sciences, London Business School, September 2002 - August 2003.
- Assistant Professor of Operations, Information, and Technology, Graduate School of Business, Stanford University, September 1996 - August 2000.

Honors and Awards

- Spence Faculty Scholar for 2004-05, Graduate School of Business, Stanford University.
- Supervised research of Xuanming Su, Finalist in the 2002 George E. Nicholson Best Student Paper Competition, INFORMS.
- Meritorious Service Award, *Operations Research*, 2000.
- Supervised research of Erica L. Plambeck, First Prize Winner in the 2000 George E. Nicholson Best Student Paper Competition, INFORMS.
- Supervised research of Prashant C. Fuloria, Second Prize Winner in the 1999 Best Student Paper Competition, Manufacturing and Service Operations Management (M&SOM) Section of INFORMS, and in the 2000 Dantzig Dissertation Award.
- “Journal Cub” editorial for the paper “Evidence-Based Organ Allocation” in the *American Journal of Medicine*, July 1999.
- Nominated for the Distinguished Teacher Award, Graduate School of Business, Stanford University, 1999 - 2002, 2004-2005.
- Fletcher Jones Faculty Scholar for 1998-99, Stanford University.
- Honorable Mention, George Dantzig Dissertation Award, INFORMS, 1997.
- First Prize, George E. Nicholson Best Student Paper Competition, INFORMS, 1997.
- First Prize, 1996 Best Student Paper Competition, M&SOM Society, INFORMS, 1996.
- Student Award, Eastern North America Region of the Biometrics Society, 1995.
- Merit Scholarship, Cambridge Commonwealth Trust, University of Cambridge, 1989-92.

Grants and Fellowships

- Toyota Motor Company, Award for the period 2003-04. Award Amount \$30,000. Title of Project: “Relational Contracting in Toyota’s Distribution Channels.”

- National Institutes of Health R01 Award for the period 2001-05. Award Amount \$1,700,000. Title of Proposal: “Toward the optimal timing of initiation of dialysis.” This is a multi-center grant involving researchers from the University of California San Francisco, and Kaiser Permanente Northern California. Co-Principal Investigators: Glenn Chertow and Stefanos Zenios.
- National Science Foundation CAREER Award for the period 2000-05. Award Amount: \$200,000. Title of Proposal: “Incentives and Coordination in Decentralized Technological Systems.”
- Competitive research intensive grant from the Office of Technology Licensing, Stanford University, 1999-00. Award Amount: \$25,000. Title of Proposal: “Profit Incentives and Operational Efficiency in Health Care”.
- Curriculum development grant from the Stanford Integrated Manufacturing Association (SIMA), 1997-98. Award Amount: \$20,000. Title of proposal: “Simulation for Business Processes”.
- Dissertation fellowship award from the Health Care Financing Administration, 1996. Award Amount: \$20,000. Title of proposal: “Kidney Allocation to Patients on the Transplant Waiting List: A Comprehensive Study”.

Teaching Experience

- *Data and Decisions*: Core Probability, Statistics, and Decision Theory course for first-year MBA students (taught both regular and advanced sections).
- *Innovation and Management in Health Care*: Second-year MBA elective.
- *Biodesign Innovation*: Project-based MBA course on Medical Technology Innovation.
- *Modeling Health Care Systems*: One-week second-year MBA seminar.
- *Simulation Modeling*: Second-year MBA elective.
- *Workshop in Operations, Information, and Technology*: Seminar for second-year Ph.D. students.

Refereed Publications

- Tunca, T. and Zenios, S.A. (2005). Supply Auctions and Relational Contracts for Procurement. *M&SOM* (in press).
- Su, X., and Zenios, S.A. (2005). Patient Choice in Kidney Allocation: A Sequential Stochastic Assignment Model. *Operations Research* (in press).
- Iyer, A.V., Schwarz, L.B., and Zenios, S.A. (2005). A Principal-Agent Model for Product Specification and Production. *Management Science* (in press).

- Su, X., and Zenios, S.A. (2004). Patient Choice in Kidney Allocation: The Role of the Queueing Discipline. *M&SOM*, 6(4): 280 - 301.
- Ross, L, and Zenios S.A. (2004). Practical and Ethical Challenges to Donor Exchange Programs, (invited editorial) *Am. J. Transplantation*, 4(10):1553-4.
- Ross, L, and Zenios S.A. (2004). Restricting Living Donor/Cadaver Donor Exchanges to Ensure that Standard Blood Type O Waitlist Candidates Benefit, *Transplantation*, 78(5):641-6.
- Su, X, Zenios, S.A., Chertow, G.M. (2004). Incorporating Recipient Choice in Kidney Transplantation, *J. Am. Soc. Nephrology*, 15(6):1656-63
- Su, X, Zenios, S.A., Chakkerla, H., Milford, E.L., Chertow, G.M. (2004). Diminishing Significance of HLA Matching in Kidney Transplantation, To appear in *Am. J. Transplantation*, 4(9):1501-8.
- Zenios, S.A. (2004). Decentralized Decision Making in Dynamic Technological Systems. *Handbook of Supply Chain Analysis in the eBusiness era*, Simchi-Levi, Wu, and Shen (eds.)
- Zenios, S.A. (2004). Models for Kidney Allocation. *Applications of OR/MS in Health Care*, Brandeau, Pierskalla, and Sainfort (eds.)
- Plambeck, E.L. and Zenios, S.A. (2003). Incentive Efficient Control of a Make-to-Stock Production System. *Operations Research*, 51, 371-386.
- Zenios S.A. (2002). Optimal Control of a Paired-Kidney Exchange Program. *Management Science*, 48, 328-342.
- Fuloria, P.C. and Zenios, S.A. (2001). Outcomes-Adjusted Reimbursement in a Health Care Delivery System. *Management Science*, 47, 735-751.
- Zenios, S.A., Woodle, S., Ross, L.S. (2001). Primo Non Noncere: The Impact of Indirect Organ Exchanges on Type O Recipients. *Transplantation*, 72(4):648-54
- Chertow, G.M. and Zenios S.A. (2001). Gridlock on the Road to Kidney Transplantation. Editorial for the *American Journal of Kidney Disease*, 37, 435-437
- Toktay, L.B, Wein, L.M. and Zenios, S.A. (2000). Inventory Management of Remanufacturable Products. *Management Science*, 46, 1412-1426.
- Zenios S.A. and Fuloria, P.C. (2000). Managing the Delivery of Dialysis Therapy: A Multiclass Fluid Model Analysis. *Management Science*, 46, 1317-1336.
- Plambeck E.L. and Zenios, S.A. (2000). Performance-Based Incentives in a Dynamic Principal-Agent Model. *M&SOM*, 2, 240-263.
- Zenios, S.A., Chertow, G.M. and Wein, L.M. (2000). Dynamic Allocation of Kidneys to Candidates on the Transplant Waiting List. *Operations Research*, 48, 549-569.
- Zenios S.A. (1999). Modeling the Transplant Waiting List: A Queueing Model with Reneging. *Queueing Systems: Theory and Applications*, 31, 239-251.

- Zenios, S.A., Wein, L.M. and Chertow, G.M. (1999). Evidence-Based Organ Allocation. *American Journal of Medicine*, 107, 52-61.
- Zenios, S.A. and Wein L.M. (1998). Pooled Testing for HIV Prevalence Estimation: Exploiting the Dilution Effect. *Statistics in Medicine*, **17**, 1447-1467.
- Wein, L.M., Zenios, S.A. and Nowak, M. (1997). Multidrug Treatment Therapies for HIV: A Control Theoretic Approach. *J. Theoretical Biology*, **185**, 15-29.
- Wein, L.M. and Zenios, S.A. (1996). Pooled Testing for HIV Screening: Capturing the Dilution Effect. *Operations Research*, Vol. 444, 543-569.

Working Papers

- Pan-Chi, L., G.M. Chertow, and Zenios S.A. (2005) A Simulation Model for End-Stage Renal Disease: Addressing the Uncertainty in Dialysis Initiation Strategies. Revision re-submitted to *Medical Decision Making*.
- Zhang, H., and Zenios, S.A. (2004). Truthful State Revelation in a Dynamic Principal-Agent Model with Hidden Information. Submitted to *Operations Research (under revision)*.
- Su, X. and Zenios, S.A. (2004). Recipient Choice Can Address the Efficiency-Equity Trade-Off in Kidney Transplantation: A Mechanism Design Model. Submitted to *Management Science (under revision)*.
- Bassamboo, A., Cavallaro J., and Zenios, S.A. (2004). Optimal Use of Manufacturing Capacity Options in Drug Development. Submitted to *Management Science (under revision)*.
- Ross, L.F, Su, X., Thistlethwaite, J.R., and Zenios, S.A. (2005). Shared Decision Making in Deceased Donor Transplantation. Submitted to *American Journal of Transplantation*.

Case Studies

- *Probability and Statistics*
 - Variance Associates, Stanford University Graduate School of Business Case Study, Fall 1997 (with M. White and P. Reiss). Main Topics: Random Variables; Variance and Covariance; Capacity Planning.
 - Eli Lilly and the Wall Street Journal Experts, Stanford University Graduate School of Business Case Study, Fall 1997 (with M. White and P. Reiss). Main Topics: Statistical Estimation, Portfolio Optimization.
 - 3Com Network Card Manufacturing, Stanford University Graduate School of Business Case Study, Fall 1997 (with M. White). Main Topics: Multivariate Regression Analysis, Quality Control.

- Northwest Airlines, Stanford University Graduate School of Business Case Study, Fall 1997 (with M. White). Main Topics: Simulation Modeling, Risk Management, Insurance.
 - The Politics of Cyprus Coffee, Stanford University Graduate School of Business Case Study, Fall 1999 (with P. Reiss and L. Benkard). Main Topics: Multivariate Regression Analysis.
 - First Miles Communication Inc, Stanford University Graduate School of Business Case Study, Fall 2001. Main Topics: Multivariate Regression Analysis, Confounding.
 - Specialty Manufacturing, Stanford University Graduate School of Business Case Study, Fall 2001. Main Topics: Production Planning and Scheduling, Linear Programming, Advanced Simulation Modeling.
- *Health Care Management*
 - BENU: Bringing Consumer Competition to Health Insurance, Stanford University Graduate School of Business Case Study (with Z. Cohen), Winter 2005. Topics: Managed Competition, Risk-Adjustment, Health Insurance Exchanges.
 - Note on Employer-Provided Health Insurance, Stanford University Graduate School of Business Case Study (with Z. Cohen), Winter 2005.
 - Challenges in Renal Care, Stanford University Graduate School of Business Case Study (with E. Rodriguez), Winter 2004. Topics: Renal Dialysis, Disease Management, New Reimbursement Models.
 - United Resource Network: Innovation in Transplantation Referral and Contracting (with L. Denend), Winter 2005. Topics: Organ Transplantation, High Costs Medical Procedures, Centers of Excellence, Volume and Quality-Based Referral and Contracting, New Reimbursement Models.
 - Process Improvement in Stanford Hospital’s Operating Room (with E. Pernaz-Giz, K. Surman). Winter 2005. Topics: Operating Room Economics, Process Improvement.
 - HUMIRA Product Launch (with R. Chess and L. Denend), Winter 2005. Topics: Product Launch Strategies for Biotechnology Products.

Ph.D Thesis Supervision

- *Principal Thesis Advisor:*
 - Donald Lee, MS&E Dept, “Capacity Management in Health Care Facilities.” (current)
 - John Cavallaro, MS&E Dept, “Essays on Pharmaceutical R&D Management.” (current)
 - Chris Lee, Inderdisciplinary Program in Scientific Computing, “Models for Optimal Initiation of Dialysis.” (current)

- Hao Zhang, Graduate School of Business, “Dynamic Principal-Agent Models with Hidden State,” June 2004, Current Position: Assistant Professor, Marshall School of Business, University of Southern California.
 - Xuanming Su, Graduate School of Business, “Essays of Patient Choice,” June 2004. Current Position: Assistant Professor, Haas School of Management, University of California, Berkeley.
 - Prashant C. Fuloria, Graduate School of Business, “Incentive and Operational Issues in Health Care Delivery Systems,” June 2000. Current Position: Closed Loop Inc.
 - Erica L. Plambeck, Department of EES&OR, “Essays on Incentives in Operations Management,” June 2000 . Current Position: Assistant Professor, Graduate School of Business, Stanford University.
- *Reading Committees and Oral Exams*
 - Gal Raz, Graduate School of Business, “A Discrete Service Levels Perspective to the Newsvendor Model,” June 2002 (examiner).
 - Kristin Fridgeirsdottir, Management Science & Engineering, “Demand Management in Delay Sensitive Markets,” May 2002 (examiner).
 - Mike Voth, Management Science & Engineering, “The Design of Staged Commitments,” May 2002 (examiner).
 - Jochen Kleinknecht, Management Science & Engineering, “Supply Contracts with Options,” May 2002 (examiner).
 - Kate Doornik, Graduate School of Business, “Incentive Contracts with Imperfect Enforcement,” March 2002 (examiner).
 - Eran Liron, Graduate School of Business, “Essays on Supply Chain Contracts,” Fall 1999 (reader).
 - Jennifer M. George, Graduate School of Business, “A Queue with Controllable Service Rates: Optimization and Incentive Compatibility,” 1999 (reader).
 - Marcel J. Lopez, Graduate School of Business, “Heavy Traffic Resource Pooling in Parallel-Server Systems,” 1999 (reader).
 - Terrence Hendershott, Graduate School of Business, “Electronic Exchanges and the Disintermediation of Dealer Markets,” 1999 (reader).
 - Eric A. Stuart, Graduate School of Business, “Essays on one- and two-sided matching, with and without transfers,” 1999 (examiner).
 - Christina Friedrich, Industrial Engineering and Engineering Management, “Continuous Cost-Effectiveness Analysis: A Framework for Supporting HIV Prevention Investment Decisions,” 1999 (examiner).
 - Greg Zarig, Industrial Engineering and Engineering Management, “Resource Allocation for Epidemic Control Over Short Time Horizons,” 1999 (examiner).
 - Marcia Tsugawa, EES&OR, “Cost-effectiveness analysis of H. pylori vaccine to prevent peptic ulcers and gastric cancer,” 1999 (examiner).
 - Wendell Gilland, Graduate School of Business, “Performance of Closed Manufacturing Networks,” 1997 (examiner).

Citizenship and Services

- Reviewer for Operations Research, Management Science, Manufacturing & Service Operations Management, Health Care Management Science, Annals of Operations Research, Interfaces, Journal of Economic Dynamics and Control, Proceedings of the National Academy of Science, New England Journal of Medicine, Medical Decision Making.
- Faculty liaison, Student Academic Committee, 2001-02, 2004-05.
- Member of George Dantzig Dissertation Award Committee, INFORMS, 2001-02.
- Judge for the 2002 Northern California Student Presentation Competition, INFORMS.
- Needs Committee, Winter 2001, Graduate School of Business, Stanford University.
- Ph.D. Field Liaison, Operations, Information, and Technology Area, Graduate School of Business, Stanford University, 1999-02.
- Organizer of the 2000 Stanford Workshop on Incentives and Coordination in Operations Management.
- Academic Standards Committee, Winter 2000, Graduate School of Business, Stanford University.
- Guest Editor, Special Issue of Management Science on Incentives and Coordination in Operations Management.
- Associate Editor for Operations Research and Management Science.
- Senior Editor, Manufacturing & Service Operations Management.
- Reviewer for the M&SOM Student Paper Competition, 1998.

Professional Societies

- Institute for Operations Research and Management Science
- Institute of Mathematical Statistics
- American Statistical Association
- Society for Medical Decision Making

Boards and Committee Membership

- Review Board for the California Technology Investment Partnership, California Technology, Trade and Commerce Agency, Division of Science, Technology, and Innovation, Sacramento, CA.

- United Network of Organ Sharing (UNOS) Kidney Allocation Modeling Oversight Committee, Richmond, VA (joined upon invitation by Dr Larry Hunsicker, ex-president of UNOS).

External Activities and Consulting Projects

- Culmini Inc, Burlingame, CA. Co-founded this healthcare data analysis company.
- Gambro Health Care, West Division, Aliso Viejo, CA. Developed a data-based continuous process improvement program for the third largest dialysis provider in the United States.
- Hotwire Inc, San Francisco, CA. Developed a data-based market research strategy for this internet startup.
- Blue Heron Biotechnology Inc, Seattle, WA. Developed discrete event simulation model for this gene synthesis startup.

Presentations and Talks

- “Pooled Testing for HIV Screening: Capturing the Dilution Effect,”
 - ORSA/TIMS Annual Meeting, Phoenix, AZ, October 1993.
 - 10th International AIDS Conference, Yokohama, Japan, August 1994.
- “Pooled Testing for HIV Prevalence Estimation: Exploiting the Dilution Effect,”
 - Meeting of the Biometrics Society, Birmingham, AL, March 1995.
 - INFORMS Annual Meeting, Los Angeles, CA, April 1995.
- “Scheduling of Negative Arrivals in an Infinite Server G-Network.” INFORMS Annual Meeting, New Orleans, LS, October 1995.
- “Allocation of Kidneys to Patients on the Transplant Waiting List,”
 - Annual Meeting of the Society for Medical Decision Making, Toronto, Canada, October 1996.
 - INFORMS Annual Meeting, Atlanta, GA, October 1996.
 - American Society of Nephrology Annual Meeting, San Antonio, TX, November 1997.
 - Department of Industrial Engineering & Engineering Management, Stanford University, October 1996.
 - Graduate School of Business, Stanford University, April 1997.
 - Department of Health Policy and Research, Stanford Medical School, August 1997.

- Department of Biostatistics, Stanford Medical School, January 1998
- “Should dialysis filters be reprocessed?” INFORMS Annual Meeting, Montreal, Canada, April 1998.
- “Simulation Models for the Organ Waiting List.” 30th International Conference on Transplantation and Clinical Immunology, Lyon, France, June 1998.
- “Operational Efficiency in Dialysis Therapy.”
 - Graduate School of Business, Stanford University, April 1998.
 - School of Business Administration, University of Washington, April 1999.
 - Kaiser Permanente, Los Angeles, June 1999.
- “The Expanded Paired Kidney Exchange Program.”
 - INFORMS Annual Meeting, Cincinnati, Ohio, April 1999.
 - Applied Probability Conference, Ulm, Germany, July 1999.
 - Operations Research Center, Massachusetts Institute of Technology, Cambridge, MA, April 2001.
 - OPIM Area, The Wharton School, University of Pennsylvania, Philadelphia, PA, May 2001.
 - Graduate School of Business, Columbia University, New York, NY, May 2001.
 - UK Transplant, Bristol, England, February 2003.
- “Performance-Based Incentives in a Dynamic Principal-Agent Model,”
 - Brown bag lunch, Economic Analysis & Policy, Graduate School of Business, Stanford University, May 1999.
 - Department of Operations Research, Naval Postgraduate School, Monterey, CA, August 1999.
 - Department of Operations Management, Krannert School of Business, Purdue University, West Lafayette, IN, April 2000.
 - Department of Industrial Engineering, LeHigh University, Bethlehem, PA, June 2001.
- “Outcomes-Based Reimbursement in a Health Care Delivery System,”
 - Department of Management Science and Statistics, Graduate School of Business, University of Michigan, Ann Arbor, MI, April 2000.
 - Department of Operations Management, Krannert School of Business, Purdue University, West Lafayette, IN, April 2000.
 - Department of Operations and Information Systems, School of Management, University of South California, Los Angeles, LA, April 2000.
 - Department of Management Science and Engineering, Stanford University, Stanford, CA, April 2000.

- Graduate School of Industrial Administration, Carnegie Mellon University, Pittsburgh, PA, May 2000.
- Managerial Economics and Decision Sciences, Kellogg School of Management, Evanston, IL, May 2000.
- First World Congress in Production and Operations Management, Sevilla, Spain, September 2000.
- LSE Health, London School of Economics, London, United Kingdom, August 2001.
- “Incentive Efficient Control of a Make-to-Stock Production System,”
 - Department of Operations Management, Krannert School of Business, Purdue University, West Lafayette, IN, April 2000.
 - INFORMS Annual Meeting, Hawaii, 2001
 - Supply Chain Thought-Leaders Roundtable, INSEAD, Fontainebleau, France, August 2001.
 - Operations and Technology Management, London Business School, London, United Kingdom, July 2001.
- “Incentives for Disease Management,”
 - Stanford OIT workshop on Incentives and Coordination in Operations Management, Stanford, CA, September 2000.
 - INFORMS Annual Meeting, Hawaii, 2001
- “Towards the Optimal Initiation of Dialysis Therapy,”
 - INFORMS Annual Meeting, Hawaii, 2001
 - INFORMS Annual Meeting, Miami, Florida, 2001
- “Screening Contracts for Product and Process Development,”
 - INFORMS Annual Meeting, Hawaii, 2001
 - NSF Workshop on Negotiations, Florida, February 2002.
- “Allocation of Kidneys to Autonomous Transplant Candidates,”
 - Operations Management Area, The Anderson School, UCLA, Los Angeles, CA, February 2002.
 - Brown bag lunch, Economic Analysis & Policy, Graduate School of Business, Stanford University, March 2002.
 - The Judge Institute of Management, Cambridge University, Cambridge, England, October 2002.
 - Decision Sciences Area, London Business School, London, England, November 2002.

- Operations Management Area, University of Chicago Graduate School of Business, Chicago, IL, November 2002.
- Operations Management Area, INSEAD, Fontainbleau, France, February 2003.
- “The Impact of Dialysis Dose Variability on Patient Outcomes,”
 - Plenary Speaker, Gambro Health Care Annual Scientific Meeting, Las Vegas, NV, June 2002.
- “Incentives and Coordination in Health Care Delivery Systems: The Effect of Recipient Choice on Organ Allocation,”
 - Keynote Speaker, 2002 Kellogg Operations Workshop, Kellogg Graduate School of Management, Evanston, IL, August 2002.
- “Improving Processes, Saving Lives: The Process Improvement Paradigm in Health Care,”
 - Cyprus Institute of International Management, Nicosia, Cyprus, February 2002.
 - LSE Health, London School of Economics, London, United Kingdom, May 2003.
- “Relational Contracts and Supply Auctions,”
 - Fuqua School of Business, Duke University, Durham, NC, March 2004
 - Graduate School of Business, Columbia University, New York, NY, April 2004
 - Stern School of Management, NYU, NY, April 2004
 - Department of Management Science and Engineering, Stanford University, Stanford, CA, May 2004