Vita

NICHOLAS SCOTT CARDELL

Salford Systems   NW 1730 Kenny Drive
8880 Rio San Diego   Pullman, WA 99163
San Diego CA, 92108   (509) 334-4477
(619) 543-8880

Ph. D., Harvard University, June 1989

Thesis: Extensions of Multinomial logit: The Hedonic Demand Model, The Non-Independent Logit Model, and The Ranked Logit Model.

Fields of Specialization:

Econometrics; Microeconomics; Economics of Technological Change; Mathematical Modeling; Labor Economics

Current Positions:

Director of R&D, Salford Systems, June 1996-
   Senior Statistician, June 1993-
   Consulting Econometrician, May 1991-May 1993.

Adjunct Associate Professor, Department of Agricultural Economics, Washington State University, 1997-
Adjunct Associate Professor, Program in Statistics, Washington State University, 1998-

Previous Positions:

Assistant Professor, Department of Economics, Washington State University:
   Faculty, Department of Economics, August 1989-1997
   Graduate Faculty, Department of Economics, November 1989-1997
   Faculty, Program in Statistics, August 1993-1997
   Graduate Faculty, Program in Statistics, January 1995-1997
The Rand Corporation: 1983 to 1989 (Rand Graduate School: 1987 to 1989)
University of California, San Diego: Fall 1985 (Visiting Professor)
Oak Ridge National Laboratory: 1980 to 1983
Harvard University, Teaching Assistant, 1975
Charles River Associates: 1973 to 1980
Consultant:
   The National Academy of Sciences Diesel Impact Study Committee: 1980
   National Economic Research Associates: 1980
   Abt Associates: 1980

Awards:

Golden Key National Honor Society Advisor of the Year: 1993. In recognition of outstanding service to the students of Washington State University. Awarded for advising students without a declared major.

Best contributed paper in Statistics and Statistical Graphics, SAS Users' Group International, Orlando FL, March 1988.

Publications:

Mittelhammer, R., Judge, G., van Akkeren, M., & Cardell N. S. (2002). Coordinate based empirical likelihood-like estimation in ill-conditioned inverse problems, *Journal of the American Statistical Association, 97,* 1108-1121.

Cardell, N. S. (1997). Variance components structures for the extreme value and logistic distributions with applications to models of heterogeneity. *Econometric Theory, 13*, 185-213.

Cardell, N. S., Fort, R., et al. (1996). Laboratory-based experimental and demonstration initiatives in teaching undergraduate economics. *American Economic Review, Proceedings,* 454-459.

Cardell, N. S., Kling, J. L., & Petry, G. (1995). Stamp returns and economic factors. *Southern Economic Journal,* 62, 411-427.

Cardell, N. S., Joerding, W., & Li, Y. (1995). Symmetry constraints for feedforward network models of gradient systems. *IEEE Transactions on Neural Networks,* 6(5), 1249-1254.

Cardell, N. S., Huang, S., & Brown, S. (1995). Decisionmaking in the motor carrier industry. *Transportation Research* 29A, 401-419.

Cardell, N. S., Joerding, W., & Li, Y. (1994). Why some feedforward networks cannot learn some polynomials. *Neural Computation, 6,* 763-768.

Cardell, N. S., & Joerding, W. (1994) Improving Generalization with Symmetry Constraints. *The International Neural Network Society: Proceedings of the World Congress on Neural Networks*, 3, 649-654.

Cardell, N. S. (1993). A modified maximum likelihood estimator for discrete choice models. *Journal of the American Statistical Association: Proceedings of the Statistical Computing Section,* 118-123.

Steinberg, D., & Cardell, N. S. (1992). Estimating logistic regression models when the dependent variable has no variance. *Communications in Statistics: Theory and Methods,* 21, 423-450.

Cardell, N. S., & Hopkins, M. (1992). The effect of milk intolerance on the consumption of milk by slaves in 1860. In R. W. Fogel & R. A. Galantine (Eds.), *Without consent or contract: Evidence and methods,* pp. 306-310. New York: W. W. Norton.

Hopkins, M., & Cardell, N. S. (1992). A correction to the computation in "Time on the cross" of the value of freedom at low-income levels. In R. W. Fogel & R. A. Galantine (Eds.), *Without consent or contract: Evidence and methods,* pp. 379-383. New York: W. W. Norton.

Hopkins, M., & Cardell, N. S. (1992). Physics and slavery: The relation between cost of calories for suckling babies and for nursing mothers. In R. W. Fogel & R. A. Galantine (Eds.), *Without consent or contract: Evidence and methods,* pp. 310-311. New York: W. W. Norton.

Cardell, N. S., & Kanouse, D. E. (1989). Modeling heterogeneity in susceptibility and infectivity for HIV infection. *Lecture Notes in Biomathematics, 83,* 138-156.

Hirst, E., Trimble, J., Goeltz, R., & Cardell, N. S. (1983). Use of synthetic data in dealing with self-selection: Improving conservation program energy savings estimates. *Evaluation Review, 7,* 807-830.

Beggs, S. D., Cardell, N. S., & Hausman, J. (1981). Assessing the potential demand for electric cars. *Journal of Econometrics, 17,* 1-19.

Beggs, S. D., & Cardell, N. S. (1980). Choice of smallest car by multi-vehicle households and the demand for electric vehicles. *Transportation Research, 14A,* 389-404.

Cardell, N. S., & Dunbar, F. C. (1980). Measuring the societal impacts of automobile downsizing. *Transportation Research, 14A,* 423-434.

Cardell, N. S., Dobson, R., & Dunbar, F. C. (1978). Consumer research implications of random coefficient models. In H. K. Hunt (Ed.), *Advances in consumer research.* (Vol. 5, Proceedings of the Eighth Annual Conference of the Association for Consumer Research.) Ann Arbor, MI: Association for Consumer Research.

Cardell, N. S., & Hopkins, M. (1978). The effect of milk intolerance on the consumption of milk by slaves in 1860. *Journal of Interdisciplinary History, 8,* 507-513.

Cardell, N. S., & Hopkins, M. (1977). Education, income, and ability: A comment. *Journal of Political Economy, 85*, 211-215.

Books:

Toder, E. J., Cardell, N. S., & Burton, E. (1978). *Trade policy and the U. S. automobile industry.* New York: Praeger Publishers.

Klass, M. W., Burrows, J. C., & Beggs, S. D., with B. Reddy, S. Cardell, et al. (1980). *International minerals cartels and embargoes: Policy implications for the United States.* New York: Praeger Publishers. (I developed the optimal policy model used in chapters 4-8 and 10, and described in the Appendix.)

Cited Unpublished Papers

Mittelhammer, R.C., Judge, G., Miller, D., & Cardell, N.S. (2004). Semiparametric moment based estimation for binary response models. Submitted to *Econometrica* for review.

Marsh, T. L., Mittelhammer R. C., & Cardell, N. S. (2003). A generalized maximum entropy estimator of the simultaneous linear statistical model. Washington State University, working paper.

Mittelhammer, R. C., & Cardell, N. S. (2002). The data-constrained GME estimator of the GLM: asymptotic theory and inference. Submitted to *Econometric Theory,* under revision.

Cardell, N. S. (1979). When are the coefficients of a ranked logit model identified for a single individual? Unpublished manuscript. Boston, MA: Charles River Associates.

Cardell, N. S. (1977). Multinomial logit with correlated stochastic terms. Unpublished manuscript. Boston, MA: Charles River Associates.

Cardell, N. S. (1975). A statistical model appropriate for a statistical test of the independence of irrelevant alternatives property of multinomial logit. Unpublished manuscript. Cambridge, MA: Charles River Associates.

Cardell, N. S., & Hopkins, M. M. (1974). The influence of IQ on income and on the relationship between education and income. Unpublished manuscript. Cambridge, MA: Harvard University.

Technical Reports:

Hildebrandt, G. G., & Cardell, N. S. (1989). *Analysis of models linking skilled maintenance manpower to military capability* (R-3619-FMP). Santa Monica, CA: The Rand Corporation.

Cardell, N. S., & Kanouse, D. (1988). *Population heterogeneity in a model of the spread of HIV infection in the United States* (WD-3897-RC). Santa Monica, CA: The Rand Corporation.

Kanouse, D., Cardell, N. S., et al. (1988). *Modeling the spread of HIV infection in the United States* (WD-3897-RC). Santa Monica, CA: The Rand Corporation.

Kanouse, D., Cardell, N. S., et al. (1987). *Estimating the prevalence and spread of HIV infection in the United States* (WD-3752-RC). Santa Monica, CA: The Rand Corporation.

Rehmus, P., & Cardell, N. S. (1986). *Tanker splitting across the SIOP bomber force* (N-2409-AF). Santa Monica, CA: The Rand Corporation.

Cohn, S., & Cardell, N. S. (1982). *Residential energy tax credit eligibility: A case study for the heat pump water heater* (ORNL/CON-71). Oak Ridge, TN: Oak Ridge National Laboratory.

Cardell, N. S. (1977). A continuous model with deterrence effects. In *The report of the U. S. Department of the Interior on the critical materials aluminum, chromium, platinum and palladium: A review and revision.* Cambridge, MA: Charles River Associates.

Cardell, N. S., DeBartolo, G., & Griliches, Z. (1977). *Methodology for predicting the demand for new electricity-using goods* (EPRI Report EA-593). Palo Alto, CA: Electric Power Research Institute.

Presentations (Selected):

Cardell, N. S. (2003). The meaning and applications of recent advances in discrete choice modeling. Paper presented to the Spring Research Conference on Statistics in Industry and Technology, Dayton Ohio.

Cardell, N. S., Golovnya, M., & Steinberg, D. (2003). Churn modeling for telecommunications: winning the NCR teradata center for CRM at Duke University competition. Paper presented to the 25th Marketing Science Conference, University of Maryland.

Fahs, R., Cardell, N. S., & Mittelhammer R. C. (2001). Semiparametric estimation and inference in multinomial choice models. Paper presented to the summer AAEA meetings, Chicago, Illinois..

Marsh, T. L., Mittelhammer, R. C., & Cardell, N. S. (1998). A structural generalized maximum entropy estimator: asymptotic theory and inference. Paper presented to the AAEA Summer Meetings, Salt Lake City.

Cardell, N. S. (August, 1995). Econometric modeling based on correlated extreme value and logistic random variance. Paper presented to the Econometric Group, University of Victoria, Wellington, New Zealand.

Cardell, N. S., & Steinberg, D. (August, 1995). A simple method for estimating optimal transformations in non-linear models. Paper presented to the American Statistical Association, Toronto, Canada. (Presented by Steinberg)

Cardell, N. S., & Steinberg, D. (July, 1995). Consistent estimation of discrete choice models based on laddered survey data. Invited paper presented to the special session on choice models of the TIMS Marketing Science Conference, Sydney, Australia. (Presented by Steinberg)

Cardell, N. S., & Joerding, W. (June, 1994). Improving Generalization with Symmetry Constraints. Paper presented to the meeting of the International Neural Network Society, San Diego.

Cardell, N. S. (May, 1993). Selection bias: Applications to military personnel decisions. Invited address, Naval Postgraduate School, Monterey, CA.

Cardell, N. S. (November, 1993). Stamp returns and economic data. Paper presented to the Department of Economics and Finance, University of Wyoming.

Cardell, N. S. (August, 1993). A modified maximum likelihood estimator for discrete choice models. Paper presented to the meeting of the American Statistical Association, San Francisco.

Cardell, N. S., & Newton, T. (April, 1990). New view of Mandelbrot and Julia. Paper presented to the meeting of the Washington State Community College Mathematics Conference, Alderbrook, WA.

Cardell, N. S. (January, 1990). Estimating logistic regression models when the dependent variable has no variance. Paper presented at the University of Alabama, Department of Economics Seminar.]

Cardell, N. S., Kanouse, D., & Gorman, M. (June, 1988). The consequences of variation in infectivity of HIV-1 with stage of infection. Paper presented to the Fourth International Conference on Acquired Immunodeficiency Syndrome, Stockholm, Sweden.

Kanouse, D., Cardell, N. S., et al. (June, 1987). Modeling the spread of human immunodeficiency virus (HIV) in the United States. Paper presented to the Third International Conference on Acquired Immunodeficiency Syndrome, Washington, D. C.

Cardell, N. S. (1986). New refinements in the modeling of jury verdicts: Testing for selection effects, and the treatment of missing values. (Rand Seminar)

Professional Activities:

Economic Inquiry, referee
Econometric Theory, referee
Journal of Political Economy, referee
Journal of Econometrics, referee
SIAM Journal on Mathematical Analysis, referee
Applied Financial Economics, referee
The National Science Foundation, proposal reviewer
U. S. General Accounting Office, referee
Reviewer, Houghton-Mifflin econometric textbook