

C. A. KNOX LOVELL

Curriculum Vitae

CURRENT POSITIONS:

Honorary Professor
School of Economics
Centre for Efficiency & Productivity Analysis
University of Queensland
Brisbane, Qld 4072, Australia
k.lovell@uq.edu.au

Emeritus Professor
Department of Economics
Terry College of Business
University of Georgia
Athens, GA 30602, USA
knox@uga.edu

HONORS:

Docteur Honoris Causa, Université de Liège, Belgium
Doctor Honoris Causa, Universidad Miguel Hernández, Spain
Who's Who in Economics

EDUCATION:

Postdoctoral Fellowship in Political Economy, University of Chicago, 1968-69
Ph.D., Duke University, 1966
A.B., College of William and Mary, 1963

PREVIOUS EMPLOYMENT:

2003- 2005 Adjunct Professor, University of the Sunshine Coast, Australia
2001- Visiting Academic, Productivity Commission, Melbourne, VIC, Australia
1999-2000 Professor and Director, Centre for Applied Economic Research, School of
Economics, University of New South Wales, Sydney, NSW, Australia
1995 Visiting Professor, Odense University, Denmark
1994-2006 C. Herman and Mary Virginia Terry Professor, Department of Economics, Terry
College of Business, University of Georgia, USA
1990-94 Visitor, CORE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium
1989 Visiting Professor, University of Adelaide, SA, Australia
1983-84 Visiting Professor, University of Pennsylvania, USA
1977-93 Professor, University of North Carolina, USA
1975-76 Visiting Associate Professor, University of British Columbia, Canada
1971-77 Associate Professor, University of North Carolina, USA
1971 Visiting Associate Professor, Economics Institute, University of Colorado, USA
1968-71 Assistant Professor, University of North Carolina, USA
1966-68 Assistant Professor, State University of New York at Binghamton, USA
1965-66 Visiting Instructor, North Carolina Central University, USA

PUBLISHED RESEARCH:

Books:

The Measurement of Efficiency of Production (with R. Färe and S. Grosskopf). Boston: Kluwer-Nijhoff Publishing, 1985.

International Applications of Productivity and Efficiency Analysis (edited with T.R. Gullede). Boston: Kluwer Academic Publishers, 1992.

The Measurement of Productive Efficiency: Techniques and Applications (edited with H. O. Fried and S. S. Schmidt). New York: Oxford University Press, 1993.

Production Frontiers (with R. Färe and S. Grosskopf). New York: Cambridge University Press, 1994.

Economic Efficiency and Productivity Growth in the Asia Pacific Region (edited with T.-T. Fu and C. J. Huang). Cheltenham, UK: Edward Elgar Publishing Ltd., 1999.

Stochastic Frontier Analysis (with S. C. Kumbhakar). New York: Cambridge University Press, 2000, paperback edition 2003, Chinese translation 2007.

Productivity and Economic Performance in the Asia-Pacific Region (edited with T.-T. Fu and C. J. Huang). Cheltenham, UK: Edward Elgar Publishing Ltd., 2002.

Public Goods, Environmental Externalities and Fiscal Competition (edited with P. Chander, J. Drèze and J. Mintz). Boston: Kluwer Academic Publishers, 2006.

The Measurement of Productive Efficiency and Productivity Growth (edited with H. O. Fried and S. S. Schmidt). New York: Oxford University Press, 2008.

Productivity Accounting: The Economics of Business Performance (with E. Grifell-Tatjé). New York: Cambridge University Press, 2015.

Selected Articles:

"Capital, Profit and Bonus in Soviet Industry: A Comment," *Economica* 33:130 (February 1966), 88-91.

"Profits and Cybernetics as Sources of Increased Efficiency in Soviet Planning," *Southern Economic Journal* 34:3 (January 1968), 392-405.

"Capacity Utilization and Production Function Estimation in Postwar American Manufacturing," *Quarterly Journal of Economics* 82:2 (May 1968), 219-39.

"The Role of Private Subsidiary Farming During the Soviet Seven-Year Plan, 1959-65," *Soviet Studies* 10:1 (July 1968) 46-66.

"Estimating the Elasticity of Substitution: A Correction and Some Further Results" (with J. Moroney), *Southern Economic Journal* 39:3, (January 1973), 437-41.

"CES and VES Production Functions in a Cross-Section Context," *Journal of Political Economy* 81:3 (May/June 1973), 705-20.

"Technology and Specification Error," *Southern Economic Journal* 40:1 (July 1973), 110-16.

"A Note on Aggregation Bias and Loss," *Journal of Econometrics* 1:3 (October 1973), 301-11.

- "Estimation and Prediction with CES and VES Production Functions," *International Economic Review* 14:3 (October 1973), 676-92.
- "Homotheticity and the Average Cost Function," *Western Economic Journal* 11:4 (December 1973), 506-13.
- "Specification Error in Generalized Production Function Models" (with D. Guilkey), *International Economic Review* 16:1 (February 1975), 161-70.
- "Extended Hicks Neutral Technical Change" (with C. Blackorby and M. Thursby), *Economic Journal* 86:4 (December 1976), 845-52.
- "Formulation and Estimation of Stochastic Frontier Production Function Models" (with D. Aigner and P. Schmidt), *Journal of Econometrics* 6:1 (July 1977), 21-37.
- "The Impact of Adjusted Factor Cost Valuation on the CES Interpretation of Soviet Economic Growth" (with S. Rosefielde), *Economica* 44:176 (November 1977), 381-92.
- "A Two Stage Model of Discriminatory Pricing," *Canadian Journal of Economics* 11:1 (February 1978), 56-68.
- "An Investigation of the Kmenta Approximation to the CES Function" (with J. Thursby), *International Economic Review* 19:2 (June 1978), 363-77.
- "Measuring the Technical Efficiency of Production" (with R. Färe), *Journal of Economic Theory* 19:1 (October 1978), 150-162.
- "Estimating Technical and Allocative Inefficiency Relative to Stochastic Production and Cost Frontiers" (with P. Schmidt), *Journal of Econometrics* 9:3 (February 1979), 343-66.
- "On the Flexibility of the Translog Approximation" (with D. Guilkey), *International Economic Review* 21:1 (February 1980), 127-47.
- "A Survey of Frontier Production Functions and of Their Relationship to Efficiency Measurement" (with F. Førsund and P. Schmidt), *Journal of Econometrics* 13:1 (May 1980), 5-26. [Translated as "Una rassegna sulla frontiere di produzione e il loro legame con la misurazione dell'efficienza," *Problemi de Amministrazione Pubblica* Vol. 10, 1985, 267-302.]
- "Estimating Stochastic Production and Cost Frontiers when Technical and Allocative Inefficiency are Correlated" (with P. Schmidt), *Journal of Econometrics* 13:1 (May 1980), 83-100.
- "Price Discrimination in Related Markets" (with K. Wertz), *Economic Inquiry* 19:3 (July 1981), 488-94.
- "Normative and Stochastic Methods of Measurement and Control of the Efficiency of Firms and Enterprises" (with S. Danilin, I. Materov and S. Rosefielde), *Ekonomike i Matematicheskie Metody* 18:1 (January 1982), 86-93.
- "On the Estimation of Technical Inefficiency in the Stochastic Frontier Production Model" (with J. Jondrow, I. Materov and P. Schmidt), *Journal of Econometrics* 19:2/3 (August 1982), 233-38.
- "Testing Efficiency Hypotheses in Joint Production: A Parametric Approach" (with R. Sickles), *Review of Economics and Statistics* 65:1 (February 1983), 51-58.
- "The Structure of Technical Efficiency" (with R. Färe and S. Grosskopf), *Scandinavian Journal of Economics* 85:2 (1983), 181-90. [Reprinted in F.R. Førsund, ed., *Topics in Production Theory*. London: Macmillan, 1984.]

- "A Comparison of the Performance of Three Flexible Functional Forms" (with D. Guilkey and R. Sickles), *International Economic Review* 24:3 (October 1983), 591-616.
- "Affinely Homothetic Production Technology" (with R. Färe), *Methods of Operations Research* 48 (1984), 197-205.
- "Measuring Enterprise Efficiency in the Soviet Union: A Stochastic Frontier Analysis" (with S. Danilin, I. Materov and S. Rosefielde), *Economica* 52:206 (May 1985), 225-34.
- "Modeling Scale Economies with Ray-Homothetic Production Functions" (with R. Färe and L. Jansson), *Review of Economics and Statistics* 67:4 (November 1985), 624-29.
- "Scale Economies and Duality" (with R. Färe and S. Grosskopf), *Zeitschrift für Nationalökonomie* 46:2 (1986), 175-82.
- "Nonparametric Disposability Tests" (with R. Färe and S. Grosskopf), *Zeitschrift für Nationalökonomie* 47:1 (1987), 77-85.
- "The Effect of Unionization on Labor Productivity: Some Additional Evidence" (with R. Sickles and R. Warren), *Journal of Labor Research* 9:1 (Winter 1988), 55-63.
- "The Effect of Unions on Productivity: U. S. Surface Mining of Coal" (with P. Byrnes, R. Färe and S. Grosskopf), *Management Science* 34:9 (September 1988), 1037-53.
- "Scale Elasticity and Scale Efficiency" (with R. Färe and S. Grosskopf), *Journal of Institutional and Theoretical Economics* 144:4 (September 1988), 721-29.
- "An Indirect Efficiency Approach to the Evaluation of Producer Performance" (with R. Färe and S. Grosskopf), *Journal of Public Economics* 37:1 (October 1988), 71-89.
- "Multilateral Productivity Comparisons When Some Outputs are Undesirable: A Nonparametric Approach" (with R. Färe, S. Grosskopf and C. Pasurka), *Review of Economics and Statistics* 71:1 (February 1989), 90-98.
- "Some Economics of Content Protection" (with R. Färe and J. Logan), *Journal of Economics* 50:2 (1989), 171-80.
- "Measuring Cost Efficiency in Banking: Econometric and Linear Programming Evidence" (with G. Ferrier), *Journal of Econometrics* 46:1/2 (October/November 1990), 229-45.
- "The Allocation of Consumer Incentives to Meet Simultaneous Sales Quotas: An Application to U.S. Army Recruiting" (with R. C. Morey), *Management Science* 37:3 (March 1991), 350-67.
- "Cost-Efficient Military Recruiting: An Econometric Approach" (with R. Morey and L.L. Wood), *Defence Economics* 2 (1991), 339-51. [Reprinted in K. Hartley and T. Sandler, eds., *The Economics of Defense*. Cheltenham, UK: Edward Elgar Publishing Ltd. (2000).]
- "Indirect Productivity Measurement" (with R. Färe and S. Grosskopf), *Journal of Productivity Analysis* 2:4 (February 1992), 283-98.
- "The CET-CES-Generalized Leontief Variable Profit Function: An Application to Indian Agriculture" (with J. Behrman, R. Pollak and R. Sickles), *Oxford Economic Papers* 44:2 (April 1992), 341-54.
- "Variation in Productive Efficiency in French Workers' Cooperatives" (with J. Defourny and A.G.M. N'Gbo), *Journal of Productivity Analysis* 3:1/2 (June 1992), 103-117.

- "Evaluating the Performance of U.S. Credit Unions" (with H. Fried and P. Vanden Eeckaut), *Journal of Banking and Finance* 17:2/3 (April 1993), 251-65.
- "Productive Efficiency Under Capitalism and State Socialism: The Chance Constrained Programming Approach" (with K. Land and S. Thore), *Public Finance/Finances Publiques* 47:5 (1993), 109-21.
- "Derivation of Shadow Prices for Undesirable Outputs: A Distance Function Approach" (with R. Färe, S. Grosskopf and S. Yaisawarng), *Review of Economics and Statistics* 75:2 (May 1993), 374-80.
- "Trade and Efficiency Effects of Domestic Content Protection" (with J. Beghin), *Review of Economics and Statistics* 75:4 (November 1993), 623-31.
- "Chance-Constrained Data Envelopment Analysis" (with K. Land and S. Thore), *Managerial and Decision Economics* 14:6 (November/December 1993), 541-54.
- "Incorporating Undesirable Outputs into Models of Production: An Application to U.S. Agriculture" (with E. Ball, R. Nehring and A. Somwaru), *Cahiers d'Economie et Sociologie Rurales* 31:2 (1994), 60-74.
- "Enhancing the Performance of Credit Unions: The Evolution of a Methodology" (with H. O. Fried), *Recherches Economiques de Louvain* 60:4 (1994), 1-17.
- "Economías de Escala y Cambios en la Productividad: El Caso de Las Casas de Ahorros Españolas" (with E. Grifell-Tatjé), *Perspectivas del Sistema Financiero* 48 (1994), 123-31.
- "Linear Programming Approaches to the Measurement and Analysis of Productive Efficiency," *Top* 2:2 (December 1994), 1-50.
- "Econometric Efficiency Analysis: A Policy-Oriented Review," *European Journal of Operational Research* 80:3 (February 1995), 452-61.
- "A Note on the Malmquist Productivity Index" (with E. Grifell-Tatjé), *Economics Letters* 47:2 (February 1995), 169-75.
- "Units Invariant and Translation Invariant DEA Models" (with J. T. Pastor), *Operations Research Letters* 18:3 (1995), 147-51.
- "Measuring Macroeconomic Performance in the OECD: A Comparison of European and Non-European Countries" (with J. T. Pastor and J. A. Turner), *European Journal of Operational Research* 87:3 (1995), 507-18.
- "Estrategias de Gestión y Cambio Productivo en el Sector Bancario Español" (with E. Grifell-Tatjé), *Papeles de Economía Española* 65 (1995), 174-84.
- "Deregulation and Productivity Decline: The Case of Spanish Savings Banks" (with E. Grifell-Tatjé), *European Economic Review* 40:6 (June 1996), 1281-1303. [Reprinted in M. J. B. Hall, ed., *The Regulation and Supervision of Banks*, Cheltenham, UK: Edward Elgar Publishing Ltd. (2000).]
- "Applying Efficiency Measurement Techniques to the Measurement of Productivity Change," *Journal of Productivity Analysis* 7:2/3 (July 1996), 329-40.
- "Biased Technical Change and the Malmquist Productivity Index" (with R Färe, E. Grifell-Tatjé and S. Grosskopf), *Scandinavian Journal of Economics* 99:1 (1997), 119-27.

- "The Relative Efficiencies of Market and Planned Economies" (with J. R. Moroney), *Southern Economic Journal* 63:4 (April 1997), 1084-93.
- "Target Setting: An Application to a Bank Branch Network" (with J. T. Pastor), *European Journal of Operational Research* 98:2 (April 16, 1997), 290-99.
- "The Impact of Liberalization on the Productive Efficiency of Indian Commercial Banks" (with A. Bhattacharyya and P. Sahay), *European Journal of Operational Research* 98:2 (April 16, 1997), 332-45.
- "The Sources of Productivity Change in Spanish Banking" (with E. Grifell-Tatjé), *European Journal of Operational Research* 98:2 (April 16, 1997), 364-80.
- "A DEA-Based Analysis of Productivity Change and Intertemporal Managerial Performance" (with E. Grifell-Tatjé), *Annals of Operations Research* 73 (1997), 177-89.
- "Weather and Pollution Abatement Costs" (with J. Leightner), *The Energy Journal* 19:2 (1998), 165-89.
- "The Impact of Financial Liberalization on the Performance of Thai Banks" (with J. Leightner), *Journal of Economics and Business* 50:2 (March/April 1998), 115-31. [Reprinted in M. J. B. Hall, ed., *The Regulation and Supervision of Banks*, Cheltenham, UK: Edward Elgar Publishing Ltd., (2000).]
- "The Impact of Regulation On Operating Cost and Substitution Possibilities" (with G. Granderson), *Southern Economic Journal* 65:1 (July 1998), 83-97.
- "A Quasi-Malmquist Productivity Index" (with E. Grifell-Tatjé and J. T. Pastor), *Journal of Productivity Analysis* 10:1 (July 1998), 7-20.
- "The Impact of Mergers on Credit Union Service Provision" (with H. O. Fried and S. Yaisawarng), *Journal of Banking and Finance* 23:2-4 (February 1999), 367-86.
- "Econometric Estimation of Technical and Environmental Efficiency: An Application to Dutch Dairy Farms" (with S. Reinhard and G. J. Thijssen), *American Journal of Agricultural Economics* 81:1 (February 1999), 44-60.
- "A Generalized Malmquist Productivity Index" (with E. Grifell-Tatjé), *Top* 7:1 (June 1999), 81-101.
- "Profits and Productivity" (with E. Grifell-Tatjé), *Management Science* 45:9 (September 1999), 1177-93.
- "Radial DEA Models Without Inputs or Without Outputs" (with J. T. Pastor), *European Journal of Operational Research* 118:1 (October 1, 1999), 46-51.
- "Evaluating the Performance of Agricultural Bank Management: The Impact of State Regulatory Policies" (with B. K. N. Armah, Jr. and T. A. Park), *Journal of Agricultural and Applied Economics* 31:3 (December 1999), 437-48.
- "Environmental Efficiency with Multiple Environmentally Detrimental Variables: Estimated with SFA and DEA" (with S. Reinhard and G. J. Thijssen), *European Journal of Operational Research* 121:2 (March 2000), 287-303.
- "Cost and Productivity" (with E. Grifell-Tatjé), *Managerial and Decision Economics* 21:1 (January/February 2000), 19-30.

"The Effects of Deregulation on the Performance of Financial Institutions: The Case of Spanish Savings Banks" (with S. C. Kumbhakar, A. Lozano-Vivas and I. Hasan), *Journal of Money, Credit and Banking* 33:1 (February 2001), 101-20.

"A Growth Maximizing Tax Structure for New Zealand" (with J. Branson), *International Tax and Public Finance* 8:2 (March 2001), 129-46.

"Graph Efficiency and Productivity Measures: An Application to U.S. Agriculture" (with J. L. Zofio), *Applied Economics* 33 (2001), 1433-42.

"Accounting for Environmental Effects and Statistical Noise in Data Envelopment Analysis" (with H. O. Fried, S. S. Schmidt and S. Yaisawarng), *Journal of Productivity Analysis* 17:1/2 (January 2002), 157-74.

"Analysis of Environmental Efficiency Variation" (with S. Reinhard and G. Thijssen), *American Journal of Agricultural Economics* 84:4 (November 2002), 1054-65.

"The Managers versus the Consultants" (with E. Grifell-Tatjé), *Scandinavian Journal of Economics* 105:1 (2003), 119-38.

"Equivalent Standard DEA Models to Provide Super-Efficiency Scores" (with A. P. B. Rouse), *Journal of the Operational Research Society* 54:1 (2003), 101-08.

"Efficiency and Productivity in the Public Sector: Dominant Themes in the Literature" (with M. A. Muñoz Pérez), *Papeles de Economía Española* 95 (2003), 47-65.

"The Decomposition of Malmquist Productivity Indexes," *Journal of Productivity Analysis* 20:3 (November 2003), 437-59.

"Excess Capacity and Expense Preference Behavior in National Health Systems: An Application to the Spanish Public Hospitals" (with A. Rodriguez-Alvarez), *Health Economics* 13:2 (February 2004), 157-69.

"World Health System Performance Revisited" (with D. B. Evans, J. A. Lauer and C. J. L. Murray), *BMC Health Services Research* 4:19 (July 2004).

"Decomposing the Dividend" (with E. Grifell-Tatjé), *Journal of Comparative Economics* 32:3 (September 2004), 500-18.

"Allocative Inefficiency and its Cost: The Case of Spanish Public Hospitals" (with A. R. Alvarez and V. F. Blanco), *International Journal of Production Economics* 92:2 (November 2004), 99-111.

"Incorporating Environmental Impacts in the Measurement of Agricultural Productivity Growth" (with V. E. Ball, H. Luu and R. Nehring), *Journal of Agricultural and Resource Economics* 29:3 (December 2004), 436-60.

"A Global Malmquist Productivity Index" (with J. T. Pastor), *Economics Letters* 88:2 (August 2005), 266-71.

"Frontier Analysis in Health Care," *International Journal of Healthcare Technology and Management* 7:1/2 (2006), 5-14.

"Equitable Resource Allocation and Operational Efficiency Evaluation" (with J. Gao and J. Campbell), *International Journal of Healthcare Technology and Management* 7:1/2 (2006), 143-67.

“Evaluating the Financial Performance of Bank Branches” (with J. T. Pastor and H. Tulkens), *Annals of Operations Research* 145:1 (July 2006), 321-37.

“One Market, One Number? A Composite Indicator Assessment of EU Internal Market Dynamics” (with L. Cherchye, W. Moesen and T. Van Puyenbroeck), *European Economic Review* 51:3 (April 2007), 749-79.

“Avoiding Unfeasibility in DEA Models with Weight Restrictions” (with M. P. E. Lins and A. C. M. da Silva), *European Journal of Operational Research* 181:2 (September 2007), 956-66.

“Circularity of the Malmquist Productivity Index” (with J. T. Pastor), *Economic Theory* 33:3 (December 2007), 591-99.

“Short-run Total Cost Change and Productivity of U.S. Class I Railroads” (with S. H. Lim), *Journal of Transport Economics and Policy* 42:1 (January 2008), 155-98.

“Productivity at the Post” (with E. Grifell-Tatjé), *Journal of Regulatory Economics* 33:2 (April 2008), 133-58.

“The Effects of Stochastic Demand and Expense Preference Behaviour on Hospital Costs and Excess Capacity” (with A. Rodríguez-Álvarez and Alan Wall), *Health Economics* 18:2 (February 2009), 227-35.

“Environmental Efficiency Measurement with Translog Distance Functions: A Parametric Approach” (with R. A. Cuesta and J. L. Zofio), *Ecological Economics* 68:8-9 (June 2009), 2232-42.

“Scale Economies and Inefficiency of U.S. Dairy Farms” (with R. Mosheim), *American Journal of Agricultural Economics* 91:3 (August 2009), 777-94.

“Profit and Productivity of U.S. Class I Railroads” (with S. H. Lim), *Managerial and Decision Economics* 30:7 (October 2009), 423-42.

“The Biennial Malmquist Productivity Index” (with M. Asmild and J. T. Pastor), *Socio-Economic Planning Sciences* 45:1 (March 2011), 10-15.

“History Lessons” (with W. W. Cooper), *Journal of Productivity Analysis* 36:2 (October 2011), 193-200.

“Testing the Product Test” (with H. Brea and E. Grifell-Tatjé), *Economics Letters* 113:2 (November 2011), 157-59.

“Families of Linear Efficiency Models Based on Debreu’s Loss Function” (with J. T. Pastor and J. Aparicio), *Journal of Productivity Analysis* 38:2 (October 2012), 109-20.

“Productivity Decline in Australian Coal Mining” (with J. E. Lovell), *Journal of Productivity Analysis* 40:3 (December 2013), 443-55.

“Productivity, Price Recovery, Capacity Constraints and their Financial Consequences” (with E. Grifell-Tatjé), *Journal of Productivity Analysis* 41:1 (February 2014), 3-17.

“A Framework for Guiding the Management of Urban Stream Health,” (with H. K. Millington and J. E. Lovell), *Ecological Economics* 109 (2015), 222-33.

Selected Chapters in Books:

"On Ray-Homothetic Production Functions" (with R. Färe and L. Jansson), in B. Carlson, G. Eliasson and I. Nadiri, eds., *The Importance of Technology and the Permanence of Structure in Economic Growth*. Stockholm: Almqvist & Wiksell (1978), 228-37.

"Measuring the Technical Efficiency of Multiple Output Production Technologies" (with R. Färe and K. Zieschang), in W. Eichhorn, R. Henn, K. Neumann and R. Shephard, eds., *Quantitative Studies on Production and Prices*. Würzburg and Vienna: Physica-Verlag (1983), 159-71.

"Measuring Efficiency in Production: With an Application to Electric Utilities" (with R. Färe, S. Grosskopf, and J. Logan), in A. Dogramaci and N. Adam, eds., *Managerial Issues in Productivity Analysis*. Boston: Kluwer-Nijhoff Publishing (1985), 185-214.

"A Comparison of Alternative Approaches to the Measurement of Productive Efficiency" (with P. Schmidt), in A. Dogramaci and R. Färe, eds., *Applications of Modern Production Theory: Efficiency and Productivity*. Boston: Kluwer-Nijhoff Publishing (1987), 3-32.

"Aggregation and Efficiency" (with R. Färe), in W. Eichhorn, ed., *Measurement in Economics*. Heidelberg, Berlin, New York, Tokyo: Physica-Verlag (1987), 639-48.

"Testing for Aggregation Bias in Efficiency Measurement" (with A. Sarkar and R. Sickles), in W. Eichhorn, ed., *Measurement in Economics*. Heidelberg, Berlin, New York, Tokyo: Physica-Verlag (1987), 187-206.

"Production Frontiers and Productive Efficiency," Chapter 1 in H. O. Fried, C. A. K. Lovell and S. S. Schmidt, eds., *The Measurement of Productive Efficiency: Techniques and Applications*. New York: Oxford University Press (1993), 3-67.

"Frontier Tales: DEA and FDH" (with P. Vanden Eeckaut), in W. E. Diewert, K. Spremann and F. Stehling, eds., *Mathematical Modelling in Economics*. Heidelberg, Berlin, New York, Tokyo: Springer-Verlag (1993), 446-57.

"Resources and Functionings: A New View of Inequality in Australia" (with S. Richardson, P. Travers and L. L. Wood), in W. Eichhorn, ed., *Models and Measurement of Welfare and Inequality*. Berlin, Heidelberg, New York: Springer-Verlag (1994), 787-807.

"Stratified Models of Education Production Using Modified DEA and Regression Analysis" (with L. C. Walters and L. L. Wood), in A. Charnes, W. W. Cooper, A. Y. Lewin and L. M. Seiford, eds., *Data Envelopment Analysis: Theory, Methodology and Applications*. Boston, Dordrecht, London: Kluwer Academic Publishers (1994), 329-51.

"A DEA Approach to the Problem of New and Disappearing Commodities in the Construction of Price Indexes" (with K. Zieschang), in A. Charnes, W. W. Cooper, A. Y. Lewin and L. M. Seiford, eds., *Data Envelopment Analysis: Theory, Methodology and Applications*. Boston, Dordrecht, London: Kluwer Academic Publishers (1994), 353-67.

"Service Productivity in U.S. Credit Unions" (with H. O. Fried and P. Vanden Eeckaut), in P. Harker, ed., *The Service Productivity and Quality Challenge*. Boston, Dordrecht, London: Kluwer Academic Publishers (1995), 365-90.

"Production and Cost Functions," in A. Kuper and J. Kuper, eds., *Social Science Encyclopedia*, Second Edition. London and New York: Routledge (1996).

"Editors' Introduction" (with T.-T. Fu and C. J. Huang), in T.-T. Fu, C. J. Huang and C. A. K. Lovell, eds., *Economic Efficiency and Productivity Growth in the Asia Pacific Region*. Cheltenham, UK: Edward Elgar Publishing Ltd. (1999), 1-18.

"An Alternative Tale of Two Cities" (with Y. P. Tang), in T.-T. Fu, C. J. Huang and C. A. K. Lovell, eds., *Economic Efficiency and Productivity Growth in the Asia Pacific Region*. Cheltenham, UK: Edward Elgar Publishing Ltd. (1999), 23-41.

"The Causes and Consequences of Expert Disagreement: Lessons from the *U.S v. AT&T Case*" (with R. Sickles), in D. Slottje, ed., *The Role of the Academic Economist in Litigation Support*. Amsterdam: North-Holland (1999), 189-205.

"Performance Assessment in the Public Sector" (with J. L. T. Blank), in J. L. T. Blank, ed., *Public Provision and Performance: Contributions from Efficiency and Productivity Measurement*. Amsterdam: North-Holland (2000), 3-21.

"Measuring Efficiency in the Public Sector," in J. L. T. Blank, ed., *Public Provision and Performance: Contributions from Efficiency and Productivity Measurement*. Amsterdam: North-Holland (2000), 23-53.

"Taxation and Economic Growth in New Zealand" (with J. Branson), in G. W. Scully and P. J. Caragata, eds., *Taxation and the Limits of Government*. Boston: Kluwer Academic Publishers (2000), 37-88.

"Looking Ahead: Future Research Opportunities in Efficiency and Productivity Analysis," in A. Alvarez Pinilla, ed., *La Medición de la Eficiencia y la Productividad*. Madrid: Pirámide (2001), 331-43.

"Performance Assessment in the Public Sector," in K. J. Fox, ed., *Efficiency in the Public Sector*. Boston: Kluwer Academic Publishers (2002), 11-35.

"Editors' Introduction" (with T.-T. Fu and C. J. Huang), in T.-T. Fu, C. J. Huang and C. A. K. Lovell, eds., *Productivity and Economic Performance in the Asia-Pacific Region*. Cheltenham, UK: Edward Elgar Publishing Ltd. (2002), 1-13.

"Environmental Productivity Accounting," in *Quantitative Tools for Microeconomic Policy Analysis*. Canberra: Productivity Commission (2005).

"Michael James Farrell" (with E. Grifell-Tatjé) in J. Segura and C. Rodriguez Braun, eds., *An Eponymous Dictionary of Economics*. Cheltenham, UK: Edward Elgar Publishing Ltd. (2005).

"Malmquist Productivity Index – Government Funded Education Services," in N. K. Avkiran, ed., *Productivity Analysis in the Service Sector with Data Envelopment Analysis, 3rd Edition* (2006).

"Efficiency and Productivity" (with H. O. Fried and S. S. Schmidt), Chapter 1 in H. O. Fried, C. A. K. Lovell and S. S. Schmidt, eds., *The Measurement of Productive Efficiency and Productivity Growth*. New York: Oxford University Press (2008).

"Production Frontier," in W. A. Darity, Jr., ed., *International Encyclopedia of the Social Sciences, 2nd Edition*. Detroit: Macmillan Reference USA (2008), Volume 6, pp. 507-08.

"Production and Cost Frontiers," in A. Kuper and J. Kuper, eds., *Social Science Encyclopedia, Third Edition*. London and New York: Routledge (2008).

"Advances in Cost Frontier Analysis of the Firm" (with E. Grifell-Tatjé), Chapter 4 in C. R. Thomas and W. F. Shughart II, eds., *The Oxford Handbook of Managerial Economics*. New York: Oxford University Press (2013).

Monographs:

Evaluating the Performance of Credit Unions (with H. O. Fried). Madison, WI: The Filene Research Institute, 1993.

Credit Union Service Oriented Peer Groups (with H. O. Fried). Madison, WI: The Filene Research Institute, 1994.

Technology Strategies of Best Practice Credit Unions: Today, The Near Future, and The Far Future (with A. E. Burger and H. O. Fried). Madison, WI: The Filene Research Institute, 1997.

How Credit Union Mergers Affect Service to Members (with H. Fried and S.Yaisawarng). Madison, WI: The Filene Research Institute, 1999.

Greenhouse Gas Emissions and the Productivity Growth of Electricity Generators (with G. Murtough, D. Appels and A. Matysek), Productivity Commission Staff Research Paper, Ausinfo, Canberra, ACT, Australia, 2001.

Experimental Estimates of Productivity Change in the Non-Market Sector: Preliminary Evidence from Government Services (with R. Baker), Internal Research Memorandum GA-521. Canberra: Productivity Commission, 2005.

Estimating Productivity Performance in Government Funded Education Services, Internal Research Memorandum 06-01. Canberra: Productivity Commission, 2006.

Profit, Productivity and Distribution (with E. Grifell-Tatjé), Documentos de Trabajo 27, Fundación BBVA, 2007. www.fbbva.es.

Working Papers:

“Productivity Measurement in Radial DEA Models with Multiple Constant Inputs,” (with G. Karagiannis), CEPA WP08/2013

PROFESSIONAL SERVICE:

Coordinator, NSF Conference on Parametric and Nonparametric Approaches to Frontier Analysis, University of North Carolina, 1988

Coordinator, Georgia Productivity Workshop, 1994, 1996, 1998

Scientific Advisory Committee, European Workshop on Efficiency and Productivity Analysis, 1991-

Advisory Committee, North American Productivity Workshop, 2000-

Organizing Committee, Taipei International Conference on Efficiency and Productivity Growth, 1997, 1999, 2002

Organizing Committee, Asia Pacific Productivity Workshop, 2003-

Scientific & Local Organizing Committee, Asia-Pacific Productivity Workshop, 2014

Southern Economic Journal
Board of Editors, 1972-74

Journal of Productivity Analysis
Advisory Board, 1989-91

Editor-in-Chief, 1992-2002
Co-editor (with O. B. Olesen & N. C. Petersen) of Special Issue on "Efficiency and Frontier Analysis," 7:2/3 (July 1996)
Co-editor (with T.-T. Fu & C. Huang) of Special Issue on "Selected Papers from the 2014 Asia-Pacific Productivity Conference," 41:2 (April 2014)

Journal of Econometrics

Co-editor (with A.Y. Lewin) of Annals, "Frontier Analysis: Parametric and Nonparametric Approaches," 46:1/2 (October/November 1990)

Management Science

Associate Editor, 1991-95

Top (Journal of the Spanish Statistical and Operations Research Society)

Advisory Board, 1994-

European Journal of Operational Research

Co-editor (with A.Y. Lewin) of Special Issue on "Productivity Analysis: Parametric and Nonparametric Applications," 80:3 (February 1995).

Operations Research

Associate Editor, 1996-99

Managerial and Decision Economics

Editorial Board, 2000-05

Business and Economics Letters / International Journal of Business and Economics

Editorial Board, 2001-

Academia Economic Papers

Co-editor (with T.-T. Fu and C. J. Huang) of Special Issue on "Efficiency and Productivity Growth," 32:3 (September 2004)

Socio-Economic Planning Sciences

Editorial Board, 2005-11

CONFERENCE, SEMINAR AND WORKSHOP PRESENTATIONS (1992-present):

1992: ASSA Meetings, New Orleans, LA
Academia Sinica, Taipei, Taiwan, ROC
National Taiwan University, Taipei, Taiwan, ROC
National Tsing Hua University, Hsin-Chu, Taiwan, ROC
National Central University, Chung-Li, Taiwan, ROC
Université de Toulouse, France
EURO XII/TIMS XXXI Meetings, Helsinki, Finland
CORE/FORMEZ Workshop, Louvain-la-Neuve, Belgium
UNED Workshop, Denia, Spain
Financial Services Conference, Federal Reserve Bank of Atlanta, GA
Wageningen Agricultural University, Wageningen, The Netherlands
CORE/CERGE Workshop, Prague, Czechoslovakia
Université Saint-Louis, Brussels, Belgium
Wharton Conference on the Service Sector, Philadelphia, PA
Southern Economic Association Meetings, Washington, DC
Purdue University, West Lafayette, IN

- 1993: ASSA Meetings, Anaheim, CA
University of Georgia, Athens, GA
U.S. Department of Agriculture, Washington, DC
IFORS Meetings, Lisbon, Portugal
CORE/FORMEZ Workshop, Louvain-la-Neuve, Belgium
Odense University, Odense, Denmark
Union College, Schenectady, NY
Atlantic Economic Society Meetings, Philadelphia, PA
III European Workshop on Efficiency and Productivity Measurement, CORE,
Université Catholique de Louvain, Louvain-la-Neuve, Belgium
Universität Hamburg, Hamburg, Germany
Southern Economic Association Meetings, New Orleans, LA
Universidad de Alicante, Alicante, Spain
Workshop on Banking, Valencia, Spain
Universitat Autònoma de Barcelona, Barcelona, Spain
- 1994: ASSA Meetings, Boston, MA
University of Georgia, Athens, GA
University of Pennsylvania, Philadelphia, PA
TIMS XXXII Meetings, Anchorage, AK
Workshop on Efficiency and Productivity, NSW Treasury, Sydney, Australia
Commonwealth Bank, Sydney, NSW, Australia
The Industry Commission, Melbourne, VIC, Australia
University of Adelaide, Adelaide, SA, Australia
Australasian Meetings of the Econometric Society, Armidale, NSW, Australia
University of New South Wales, Sydney, NSW, Australia
Universidad de Alicante, Alicante, Spain
Filene Research Council, Phoenix, AZ
Universitat Autònoma de Barcelona, Barcelona, Spain
CORE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium
- 1995: ASSA Meetings, Washington, DC
University of Copenhagen, Copenhagen, Denmark
Advanced Workshop on Efficiency Measurement, Odense University, Odense, Denmark
European Economic Association Meetings, Prague, The Czech Republic
University of Copenhagen, Copenhagen, Denmark
University of Zagreb, Zagreb, Croatia
Katholieke Universiteit Leuven, Leuven, Belgium
IV European Workshop on Efficiency and Productivity Measurement, CORE,
Université Catholique de Louvain, Louvain-la-Neuve, Belgium
University of Sydney, Sydney, NSW, Australia
New England Conference on Efficiency and Productivity, University of New England,
Armidale, NSW, Australia
University of New South Wales, Sydney, NSW, Australia
University of Adelaide, Adelaide, SA, Australia
University of Auckland, Auckland, New Zealand
Workshop on Monitoring the Health of the Tax System, Inland Revenue Department,
Wellington, New Zealand
First Annual Seminar on Efficiency in New Zealand Industry, Wellington, New Zealand
- 1996: Workshop on Applying Efficiency Analysis to Engineering and the Social Sciences,
Union College, Schenectady, NY
University of New South Wales, Sydney, NSW, Australia
Filene Research Institute Research Council Meeting, San Diego, CA
INFORMS Meetings, Washington, DC

- Filene Research Institute Research Council Meeting, Marina del Rey, CA
 Southern Economic Association Meetings, Washington, DC
 Workshop on Research in Cooperative Societies, Brisbane, QLD, Australia
- 1997: University of Nebraska, Lincoln, NE
 Central Queensland University, Sydney, NSW, Australia
 University of Canterbury, Christchurch, New Zealand
 Inland Revenue Department, Wellington, New Zealand
 Workshop on the Performance of Financial Institutions, Wharton Financial Institutions Center,
 University of Pennsylvania, Philadelphia, PA
 Workshop on the Health of the New Zealand Tax System, Inland Revenue Department,
 Wellington, New Zealand
 Taipei International Conference on Efficiency and Productivity Growth, Taipei, Taiwan, ROC
 EURO/INFORMS Joint International Meeting, Barcelona, Spain
 Instituut voor Onderzoek van Overheidsuitgaven, The Hague, The Netherlands
 V European Workshop on Efficiency and Productivity Analysis, Copenhagen, Denmark
 International Conference on Public Sector Efficiency, University of New South Wales,
 Sydney, NSW, Australia
 Academia Sinica, Taipei, Taiwan, ROC
 Council for Economic Planning and Development, Taipei, Taiwan, ROC
- 1998: Conference on Consolidation in the Financial Services Industry, Federal Reserve Bank of NY,
 New York, NY
 University of West Virginia, Morgantown, WV
 University of Georgia, Athens, GA
 Workshop on Efficiency and Productivity, Universidad de Oviedo, Spain
- 1999: University of New England, Armidale, NSW, Australia
 Baptist University of Hong Kong
 Taipei International Conference on Efficiency and Productivity Growth, Taipei, Taiwan, ROC
 Minisymposium on Efficiency, Firm Size and Productivity Growth, Wageningen Agricultural
 University, Wageningen, The Netherlands
 VI European Workshop on Efficiency and Productivity Analysis, Copenhagen, Denmark
 PhD Conference in Economics and Business, University of Western Australia, Perth, WA,
 Australia
 Productivity Commission, Melbourne, VIC, Australia
- 2000: Electricity Supply Association of Australia, Sydney, NSW, Australia
 International Conference on Sustainable Energy: New Challenges for Agriculture and
 Implications for Land Use, Wageningen University, Wageningen, The Netherlands
 Banking and Finance Workshop, Miguel Hernandez University, Alicante, Spain
 II Oviedo Workshop on Efficiency and Productivity, Universidad de Oviedo, Spain
 Tamkang University, Taipei, Taiwan, ROC
 Federal University of Rio de Janeiro, Brazil
 XXXII Brazilian Operations Research Society, Universidade Federal de Viçosa, Minas Gerais,
 Brazil
- 2001: World Health Organization Meeting on Health System Performance, New Orleans, LA
 Productivity Commission, Melbourne, VIC, Australia
 Workshop on DEA, Southern Denmark University, Odense, Denmark
 VII European Workshop on Efficiency and Productivity Analysis, Universidad de Oviedo, Spain
 University of Wisconsin, Madison, WI
- 2002: Easter 2002 Workshop on Efficiency and Productivity Analysis, University of Leicester
 Management Centre, Leicester, UK
 Aston Business School, University of Aston, Birmingham, UK

- Australasian Meetings of the Econometric Society, Queensland University of Technology, Brisbane, QLD, Australia
 University of Southern Queensland, Toowoomba, QLD, Australia
 Asia Conference on Efficiency and Productivity Growth, Academia Sinica, Taipei, Taiwan
 Federal University of Rio de Janeiro, Brazil
- 2003: University of Queensland, Brisbane, QLD, Australia
 Universitat Autònoma de Barcelona, Spain
 Universidad Miguel Hernández, Spain
 Federal University of Rio de Janeiro, Brazil
 VIII European Workshop on Efficiency and Productivity Analysis, Universidad de Oviedo, Spain
 Katholieke Universiteit Leuven, Leuven, Belgium
 CORE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium
- 2004: Université Laval, Quebec, Canada
 Econometric Society Australasian Meetings, Melbourne, VIC, Australia
 Asia Pacific Productivity Conference, Brisbane, QLD, Australia
 Productivity Commission, Melbourne, VIC, Australia
 Conference on “Quantitative Tools for Microeconomic Policy Analysis,” Canberra, Australia
- 2005: Taipei Conference on Efficiency and Productivity Growth, Academia Sinica, Taiwan
 Taipei Advanced Lecture Series on Productivity and Efficiency Research, National Central University, Taiwan
 Griffith University, Brisbane, QLD, Australia
 Productivity Commission, Canberra, ACT, Australia
- 2006: University of Queensland, Brisbane, QLD, Australia
 Productivity Commission, Melbourne, VIC, Australia
 Union College, Schenectady, NY
 IV North American Productivity Workshop, New York University, New York, NY
- 2007: Taipei International Conference on Efficiency and Productivity, Academia Sinica, Taipei, Taiwan
 Advanced Lectures on Productivity and Efficiency Research, National Taiwan University, Taipei, Taiwan
 National Sun Yat-Sen University, Kaohsiung, Taiwan
 X European Workshop on Efficiency and Productivity Analysis, Lille, France
 School of Management, University of Leicester, Leicester, UK
 International Training Workshop on Performance Measurement with Data Envelopment Analysis and Stochastic Frontier Analysis, School of Management, University of Leicester, Leicester, UK
 Universiteit Antwerpen, Antwerp, Belgium
 Katholieke Universiteit Leuven, Leuven, Belgium
- 2008: Asia Pacific Productivity Conference, Academia Sinica, Taipei, Taiwan
- 2009: Taiwan Productivity and Efficiency Conference, Academia Sinica, Taipei, Taiwan
- 2010: University of Queensland, Brisbane, QLD, Australia
 VI North American Productivity Workshop, Rice University, Houston, TX
 Asia Pacific Productivity Conference, Academia Sinica, Taipei, Taiwan
 International Workshop on Efficiency and Productivity in honour of Prof. Knox Lovell, Universitat Miguel Hernández, Elche, Spain
 Inaugural Lecture, MMOBE-DEMO Programme, Departament d’Economia de l’Empresa, Universitat Autònoma de Barcelona, Barcelona, Spain
- 2011: University of Queensland, Brisbane, QLD, Australia

- XII European Workshop on Efficiency and Productivity Analysis, Verona, Italy
Advanced Lecture Workshop, Soochow University, Taipei, Taiwan
Taiwan Productivity and Efficiency Conference, Academia Sinica, Taipei, Taiwan
- 2012: VII North American Productivity Workshop, Rice University, Houston, TX
National Marine Fisheries Service Productivity Workshop, Southwest Fisheries Science Center,
Santa Cruz, CA
Advanced Lecture Workshop, National Taiwan University, Taipei, Taiwan
Taiwan Productivity & Efficiency Conference, Soochow University, Taipei, Taiwan
University of Queensland, Brisbane, QLD, Australia
- 2013: HEC School of Management, Université de Liège, Belgium
Institute of Business and Management, National Chaio Tung University, Taipei, Taiwan
Advanced Lecture Workshop, School of Business, Soochow University, Taipei, Taiwan
Taiwan Productivity & Efficiency Conference, Soochow University, Taipei, Taiwan
- 2014: Aalto University, Helsinki, Finland