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## Economist and Editor George S. Tolley A special issue in his honor

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### Abstract

The purpose of this special issue of *Resource and Energy Economics* is to honor economist and founding Co-editor of this journal, George S. Tolley. This introduction to this tribute offers a perspective on his career and an overview of the articles written for this issue. © 2002 Elsevier Science B.V. All rights reserved.

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### 1. The economist

George S. Tolley is an economist to the bone. He is both the product and the epitome of a Chicago tradition of passion for economics and utmost confidence in the power of the discipline. Fundamental principles are the points of departure for analysis that provide deep understanding of behavior and insightful prescriptions for public policy. Focus is on what can be accomplished with such an approach rather than on the infinite number of possible impediments. An ethic of sustained, tireless work is inherent. For more than half a century, George S. Tolley has been a practicing economist and more than 40 years have been at the University of Chicago. He was a graduate student at Chicago, where he received his MA and Ph.D. degrees. He was an assistant professor at Chicago, spent 11 years on the faculty at North Carolina State University, and returned to Chicago as a professor in 1966. As D. Gale Johnson notes in his article in this issue, he and George S. Tolley were

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both influenced by T.W. Schultz especially in the high value of testing and contesting ideas through research papers in workshops. George's refreshingly unpretentious nature tended to make his urban and resources workshops less dramatic than some others in the department. However, a typical experience of someone who gave a paper was to realize sometime after the workshop, if not during, how challenging and helpful it had been. Appreciation for both the accomplishments and limitations of the work was keener.

George S. Tolley's gentle but probing questions have influenced his colleagues and generations of graduate students to think more clearly about how to use their economic tool kit to answer policy questions. He has been equally able to influence the broader group of social scientists and public administrators who develop and implement public policy. As a member of multidisciplinary academic committees and while working with and in government, he has been able to focus attention on basic economic questions. How will individuals react to this policy? How will achieving this policy goal affect the attainment of other policy goals? While many economists can tell noneconomists these things, George's great talent is in getting them to believe that they had discovered these issues on their own.

George has had numerous opportunities to use his talents to influence policy. In 1965–1966, he was Director of the Economic Development Division of the Economic Research Service at the US Department of Agriculture. He was Deputy Assistant Secretary and Director of the Office of Tax Analysis at the US Department of Treasury in 1974–1975. Through millions of dollars worth of grants from the National Science Foundation and the US Environmental Protection Agency, as examples, he did research that gave him access to public policy makers. In this way and through service on advisory boards and commissions he contributed to policy. He served on the President's Task Force on Urban Renewal, the National Academy of Sciences Committee on Automotive Pollution, the Energy Engineering Board at the National Research Council as well as others including groups at the state level in Illinois, and local level in Chicago.

## 2. Contributions

By standard measures George S. Tolley's contributions are substantial. His articles number more than 50 and 12 appear in the best general journals in the profession including the *American Economic Review*, *Econometrica*, *Journal of Political Economy*, *Review of Economics and Statistics*, and *Quarterly Journal of Economics*. Others appear in field journals, such as the *American Journal of Agricultural Economics*, *Journal of Environmental Economics and Management*, *Journal of Urban Economics*, and of course *Resource and Energy Economics*. His books number 21 and cover a broad range of topics including, watershed planning, electricity availability, urban growth, urban amenities, visibility, environmental policy, income support for the aged, and valuing health for policy. He has contributed 79 chapters to books and conference proceedings and has written 18 policy monographs and technical reports. The extraordinary number of contributed works reflects George's intense desire to do economics that shapes public policy. A sample of topics includes migration and agricultural policy, water allocation, water investments in depressed areas, international trade in agriculture and economic development, social costs and rural–urban balance, resource allocation effects of environmental policies, fiscal

externalities and suburbanization, road capacity and city size, tax rates and national incomes, and freeing up transit markets. Invited contributions include entries on water resources in the *International Encyclopedia of the Social Sciences*, city size and place in the *Handbook of Regional and Urban Economics*, and regional economics in the *New Palgrave Dictionary of Economics*.

Citations, another standard measure, also indicate George S. Tolley has made a substantial impact. Two examples illustrate. One example is “welfare economics of city bigness” that appeared in the *Journal of Urban Economics* (Tolley, 1974). According to a full search of the Institute for Scientific Information Web of Science Citation Database, that article has been cited 41 times. A more recent example is *Valuing Health for Policy: An Economic Approach*, which he wrote and edited with Don Kenkel and Robert Fabian (Tolley et al., 1994). According to the same type of search of the Web of Science, this University of Chicago Press book has been cited 78 times. Most publications in economics are never cited 78 or 41 times.

By another, perhaps less conventional, measure George S. Tolley’s contribution is enormous. His insatiable appetite for economics and his talent as an academic entrepreneur have led him to collaborate with colleagues and graduate students. As a mentor, he encouraged, challenged, supported, and tried the patience of hundreds of graduate students as they were developing into professional economists. The research assistantships he offered graduate students often presented the first opportunity to gain research experience. This support encouraged investments in human capital yielding career-long returns as well as keeping bread on more than one table during graduate school. Generations of students have benefited from the remarkable amounts of time and energy devoted to them. As one of the many students who has waited in the long line outside George’s office once remarked, he probably gave more time than deserved, and certainly more time than he had scheduled. Deserved or not, his influence went well beyond his courses and the dissertations he directed.

While information about his publications is available using electronic search tools, information about his role as a mentor is not. Table 1 shows a list of the dissertations that George S. Tolley directed at North Carolina State University and Table 2 shows a list of dissertations he directed in economics at the University of Chicago. The lists are remarkable for their combined length and the breadth of topics. During the period 1960–2000, he directed 69 completed dissertations. During the period 1955–1966, his 11 years at North Carolina State University, he directed 12 completed dissertations. At the University of Chicago during the 33-year period beginning in 1967, approximately one dissertation per year was completed under his guidance except for two extraordinary spells. Those two 5 years spells were 1975–1979 and 1990–1994, when an average of three dissertations per year were completed. Allowing for dissertation topics that fall into more than one area and allowing for leeway in classifying topics into categories, a pattern emerges. At least 36 dissertations deal with urban, regional, and real estate economics; at least 16 dissertations deal with environmental, energy, and health economics; at least 16 pertain to agricultural and development economics; at least 10 pertain to public finance; and others cross into labor economics and industrial organization. While this array gives some idea of his varied interests, the common element is a passion for using economics to gain insights into behavior and policy. George has shared this quest with his students. The fact that names can be recognized on the list of students suggests that his contributions go well beyond his

Table 1

Dissertations directed by George S. Tolley at North Carolina State University, 1960–1966

R.W. Gieseman	1960	“Explanation of Consumer Behavior in Terms of Want-Satiation Measures for Goods”
L.M. Hartman	1960	“Influence of Federal Acreage Controls on Costs and Production Practices for Tobacco”
Joe S. Chappell	1963	“An Analytical Model for Selecting Optimal Merchandising and Storage Plans for Multiple Commodities”
Herbert W. Grubb	1964	“Individual and Aggregate Benefits and Costs of Soil Conservation in the South”
Warren E. Johnston	1964	“The Supply of Farm Operators”
Wayne E. Boyet	1965	“Area Complex and National Park Recreation Demand Projection”
Bobby R. Eddleman	1965	“The Rate of Relocation as a Determinant of Southern Area Industrial Growth”
Roger N. Harris	1965	“Determinants of Central Shopping and Residential Land Values”
Joseph C. Matthews, Jr.	1965	“Human Resources in the Economy of the Upper French Broad Area”
Edmund F. Jansen, Jr.	1966	“Employment Participation Behavioral Relationships”
Sah Kuhn Moak	1966	“Projecting Irrigation of Flue-Cured Tobacco in North Carolina”
Ronald A. Schrimper	1966	“Micro-Aggregated Theory of Agricultural Adjustments with Application to Farm Number Changes”

Table 2

Dissertations Directed by George S. Tolley in the Department of Economics at the University of Chicago, 1968–2000

John C. Weicher	1968	“Municipal Services and Urban Renewal”
Salvatore Ferrera	1969	“The Effect of the Hyde-Park Kenwood Urban Renewal on Property Values”
Lawrence Schall	1969	“Technological Externalities and Resource Allocation”
T. Nicolaus Tideman	1969	“Three Approaches to Improving Urban Land Use”
Orville Grimes	1971	“Evaluation of Recreation and Aesthetic Uses of Water in an Urban Setting”
J. Vernon Henderson	1972	“The Types of Sizes of Cities: A General Equilibrium Model”
Oded Izraeli	1973	“Differentials in Nominal Wages and Prices between Cities”
Michael McPherson	1974	“The Effects of Public on Private College Enrollment”
Barton A. Smith	1974	“The Supply of Urban Housing”
Humphrey H. Milner	1975	“Puerto Rican Growth: A Two Stage CES Production Function”
Bruce Bender	1976	“The Determinants of Housing Abandonment”
Richard V. Burkhauser	1976	“The Early Pension Decision and Its Effect on Exit from the Labor Market”
John Hekman	1976	“An Analysis of the Changing Location of Iron and Steel Production in the Twentieth Century”
Chung Ming Wong	1976	“A Model of the Rice Economy of Thailand”
Glenn C. Blomquist	1977	“Value of Life: Implications of Automobile Seat Belt Use”
Peter Linneman	1977	“An Analysis of the Demand for Residence Site Characteristics”
Robert Pollard	1977	“Topographic Amenities and Building Height in an Urban Housing Model”
Vinod Thomas	1977	“The Welfare Cost of Pollution Control with Spatial Alternatives”
Roger J. Vaughan	1977	“The Value of Urban Open Space”
Douglas B. Diamond	1978	“Income and Residential Location in Urban Areas”
Donald Haurin	1978	“Property Taxation in an Urban Economy”

Table 2 (Continued)

Michael K. Duffy	1979	“Inter-Urban Migration: Household Residence Relocation and Empirical Analysis”
James Hodge	1979	“A Model of Firms’ Investment Decisions across Regions”
Paul Levy	1979	“Agglomerate Economies in a Spatial Setting with Special Emphasis on Shopping Centers”
Richard Clemmer	1981	“The Welfare Effects of Quantity Constrained Price Subsidies: The Case of Public Housing”
Ronald J. Krumm	1981	“Effects of Minimum Wages with Worker Skill Distributions and Regions”
William B. Shear	1981	“The Urban Housing Rehabilitation Decision”
Larry Huckins	1983	“Municipal Government Expenditures and Factor Demand”
Roger Duncan	1984	“The Location of Midwest Rural Population 1880–1910: A Derived Demand Analysis”
James Oehmke	1985	“A Theory of Induced Research and Applications to US Agriculture”
John Crihfield	1986	“An Empirical Analysis of Regional Supply and Labor Demand Functions”
Tracy Miller	1986	“Explaining Agricultural Price Policy across Countries and across Commodities between Interest Groups”
Donald Kenkel	1987	“The Demand for Preventive Care”
Vincent Cheng-Huat Chua	1989	“Estimating Congestion and Scale Economies for Public Goods”
David R. Barker	1991	“Real Estate, Real Estate Investment: Trust and Closed-End Fund Valuation”
Raymond R. Geddes	1991	“Marginal Tenure and Monitoring in Publicly and Privately Owned Electric Utilities”
Dong Ju Kim	1991	“Productivity, Rural-Urban Transformation, and Economic Growth in an Open Economy: Theory and Measurement”
Moonjoong Tcha	1992	“Altruism and Migration – Korea and the US”
Yih-Chyi Chuang	1993	“Learning by Doing, Technology Gap, and Growth”
Peter Hoyt Griffes	1993	“Risk Sharing in Electricity Generation: The Case of Jointly Owned Plants”
Jay Hyung Kim	1993	“Joint Decision of Housing Demand and Home Purchase Timing with Imperfect Capital Markets”
Mark Luther Nielson	1993	“Investigation Costs and the Effects of Own Variance on Security Prices”
Glenn Harry Ackerman	1994	“Renters, Homeowners, Politics and Tiebout”
Keun Ho Chang	1994	“A Model of the Tax Structure of the US Government”
Mansour Haroun	1994	“Mortgage Choice and Asset Pricing”
Han Gun Joun	1994	“Family Member Quality and Housing Demand”
Szu-lang Liao	1994	“Real Estate Investment and Pricing: The Role of Transaction Costs”
Shannon Brett Mudd	1994	“The Structure of Trade in a Model of Quality-Differentiated Goods and Human Capital”
Ming-cheng Wang	1994	“Time Cost, Consumption Composition, and Product Cycle”
David Chih-wei Hsu	1995	“Inter-Area Differences in Wages: Theory and Evidence”
Allan Lawrence Shampine	1996	“An Evaluation of Technology Diffusion Models and Their Implications”
Apurva Sanghi	1998	“The Economic Impact of Global Warming on Brazilian and Indian Agriculture”

Table 2 (Continued)

Joseph Anthony Krock	1999	“A Model of the Supply and Demand of Public Golf Services in Chicago”
Acevedo Hernandez	2000	“An Essay on City Sizes and Urbanization Processes”
Dong Kim	2000	“Two Essays on a Contingent Valuation Model”
Craig Martin Koerner	2000	“Explaining Industry Level R & D Expenditures with a Stock of Knowledge Variable”
Ardith Anne Spence	2000	“Wants for Waste: The Economics of Social Norms and Household Recycling Habits”

own publications. If we recognize the influence George has had on post-doctoral, visiting professors, such as John Gardner, Philip Graves, and Gideon Fishelson, his contribution is greater still.

### 3. Articles in this issue

This special issue builds on George S. Tolley’s interests in environmental and resource economics and topics in urban economics within the scope of *Resource and Energy Economics*. Each article is related in this general way, but stands on its own. The seven articles were written independently without coordination of specific topics.

In “The Effect of Resource Quality Information on Resource Injury Perceptions and Contingent Values”, John Hoehn and Alan Randall enhance a Bayesian updating model originally developed by Kip Viscusi and apply it in a state-of-the-art natural resource damages assessment of years of mining in the Coeur d’Alene area of Idaho. They allow for multidimensionality of the resource and differences in prior knowledge among individuals. Their analysis of primary data collected through home interviews shows that science-based information has an impact on both resource injury perception and values of damage reduction. The same information affected individuals differently. Some individuals increased their perceptions of damage severity and values of restoration, but other individuals decreased their perceptions of severity and values. More information did not necessarily lead to increases in willingness to pay. Heterogeneity of the individual respondents with respect to their prior information is a critical determinant of information effects. Ted Gayer and Kip Viscusi, in “Housing Price Responses to Newspaper Publicity of Hazardous Waste Sites”, examine the relationship between information provided by newspaper coverage of Superfund sites and neighborhood housing prices. Coverage that causes updating of prior information and changes risk perceptions should manifest itself in changes in the housing market. Their analysis of coverage of Superfund sites in the Greater Grand Rapids, Michigan, area shows that housing prices rose with each additional article about neighborhood sites. Analysis of cancer risk associated with the local sites indicated that local sites were not as toxic as the average Superfund site in the US. The rise in local housing prices is consistent with local residents having based their prior risk estimates on the national average and that new information about the neighborhood sites was good news. Accurate predictions about the impact of information in housing markets and contingent markets require considerable thought about what individuals already know and what they expect.

Hazardous waste sites and perceptions about the intent in their location are integral to “The Locality of Waste Sites with the City of Chicago: A Demographic, Social, and Economic Analysis” by Brett Baden and Don L. Coursey. They address the perception that environmental racism has been a determining factor in the location of hazardous waste in Chicago. A rich, detailed history of changes in the locations of waste sites and groups of people of different economic and racial characteristics in Chicago coupled with a statistical analysis of census data covering a 40 years span provide a fascinating story of interrelationships. Proximity to transportation, proximity to employment, and income working through property markets appear to have played leading roles in this major urban area. Evidence suggesting a detectable, but less than prominent role for race stands in contrast to a number of earlier studies without the same combination of historical detail and statistical sophistication.

In “Urban Primacy, External Costs, and Quality of Life” Vernon Henderson measures the costs of mega-cities and excessive urban concentration. He reasons that basic political institutions in countries favor the national capitals and encourage the largest cities to be too big. As too many national resources are devoted to the primate cities, the opportunity costs are experienced as too little public investment in the rest of the economies. Underinvestment leads to deterioration in quality of life in average-sized cities. He analyses United Nations data for nearly 90 metropolitan areas around the world and finds that cost of living increases with city size and, more importantly, that primacy adversely affects residents of non-primate cities through worse quality of life as measured by child mortality, regular waste collection, and school class size. An implication is that a policy based on less favoritism and more self-governance at the city level would improve overall quality of life.

Externalities within cities are the subject of “Treating Open Space as an Urban Amenity” by Kerry Smith, Christine Poulos, and Hyun Kim. They develop further the idea that the spatial configuration of land use during urban growth can have external effects and that participants in the housing market will distinguish between different types of open space. Open space that is fixed will have a consistent effect as an amenity over time, but open space that is adjustable will have effects that vary with expectations about future use. They analyse a nearly 30-year time profile of housing sales in the rapidly growing Research Triangle area of North Carolina. Comparison of hedonic models indicates that proximity to open space influences property values and that a distinction between fixed open space, such as a golf course, and adjustable open space, such as vacant land, helps measure the value of open space. Capturing the impact of the full pattern of land use and associated amenities is a challenge, but this analysis suggests it is worth pursuing.

Demand revelation for a more global public good is addressed in “The Private Provision of Public Goods: Tests of a Provision Point Mechanism for Funding Green Power Programs” by Steven K. Rose, Jeremy Clark, Gregory L. Poe, Daniel Rondeau, and William D. Schulze. This paper replicates a provision point mechanism for a project both to generate electricity with landfill gas and to plant trees for the Niagara Mohawk Power Corporation in upstate New York. This replication is done in a laboratory experiment in which the real worth of the program is known. The critical component is that the amount which must flow from participation in the voluntary program is specified along with what happens if the amount is exceeded (more good is supplied) and what happens if the amount is insufficient (everything is refunded.) Results of the laboratory experiment show aggregate participation is consistent

with demand revelation. Interestingly, analysis of individual participation shows both some other-regarding behavior and free riding and that the two tendencies appear to offset each other in aggregate. Results of a paired field experiment that offered the real opportunity to participate in the GreenChoice program and add US\$ 6 to the individual's monthly utility bill provides evidence that the provision point mechanism increased participation in the program. Optimal provision of well-defined, local public goods is difficult enough, but techniques, perhaps such as the one described in this paper, are needed to estimate better the benefits of goods which affect global warming with widespread and less certain benefits.

The closing article in this special issue, "The Declining Importance of Natural Resources: Lessons from Agricultural Land", is by D. Gale Johnson, a long time colleague of George S. Tolley at the University of Chicago. The article is heavily influenced by their teacher and colleague, Theodore W. Schultz. D. Gale Johnson recounts that during the 1920s, a group of outstanding researchers predicted that the limited natural resource, land, would be such a limiting factor that the US would not be able to provide for domestic food demand without great change. He continues to recount how the introduction of the tractor and high-yielding crop varieties and increases in the education attainment of farmers led to remarkable increases in productivity which made the quantity of land less important. He describes the fundamental nature of human capital and the vital role that knowledge has played in developing substitutes for land and hints that the same is likely to happen for other natural resources. He argues that natural resources will continue to be valuable and that institutions should be improved so that property rights are well-defined and private incentives promote treatment of the resources as valuable. A message with a long run perspective is appropriate from a recent president of the American Economic Association. An article about agricultural land and education is fitting in that George S. Tolley's interest in urban, environmental and resource economics grew from work in agricultural economics earlier in his career.

#### **4. Contributors and acknowledgements**

George S. Tolley used and developed a variety of analytical tools. The articles in this issue are in the same spirit in that they use hedonic analysis of housing prices, stated preferences from contingent markets using surveys, and laboratory and field experiments. Often, George chose to collaborate on projects, and in this issue, the number of authors per article ranges from one to seven with a mean of 2.4. The common element that runs through the papers is that they fall within the areas of environmental, resource, and urban economics and are written by individuals who have worked with George directly or indirectly during his ongoing career. Like George, several of the authors were principal investigators on cooperative agreements with the US Environmental Protection Agency during the 1980s. This funded research, intended to develop further the estimation of benefits of environmental policy, brought together as collaborators or reviewers John Hoehn, Alan Randall, William Schulze, Kerry Smith, and Kip Viscusi. This group was the core of people invited to contribute to this special issue. To this group were added individuals who had worked with George and whom I knew were still working on topics that would fall within the scope of this journal. I appreciate the contributors who readily agreed to submit papers for the issue.

I regret that due to my imperfect knowledge of the complete set of all individuals with whom George has worked and even less awareness of what each one is working on, I failed to extend invitations to people who should have been asked. To each of these individuals I offer my apology and hope they will join me in honoring George. I know some had the chance to talk with him at the reception in his honor at the meetings of the American Economic Association in New Orleans in January 2001.

I am grateful for the opportunity to edit this special issue and thank editor Charles Kolstad for offering it. His guidance and patience are appreciated. I am grateful also to referees. All papers submitted were subjected to the review process of *Resource and Energy Economics* and were reviewed by two referees, one chosen by Charles Kolstad and one chosen by me. Each paper in this issue was revised before final acceptance. Credit goes to the referees and authors for the value added during this process. Kathleen Blomquist, Richard Burkhauser, Don Kenkel, and Charles Kolstad all read a draft of this introductory article. I thank them for insightful, and sometimes delightful, suggestions. My appreciation goes also to Marguerite Czyzewski at the University of Chicago for the list of Chicago dissertations, to James Easley, Jr. for the list of dissertations at North Carolina State University, the Carl F. Pollard Professorship in Health Economics for support, the University of Kentucky for a sabbatical during which to complete this special issue, and the Stockholm School of Economics for granting me a place and research environment to spend the sabbatical.

To George S. Tolley, long time editor and always an economist, we offer this special issue of *Resource and Energy Economics*.

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