

## Tayler H. Bingham, Senior Consulting Economist

### Veritas Economic Consulting, LLC

1851 Evans Road, Cary, NC 27513

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#### PRACTICE AREAS

- Environmental Economics
- Policy Analysis
- Natural Resource Damage Assessment (NRDA)

#### EXPERTISE

- Statistical Analysis
- Regulatory Economics Research
- Natural Resource Economics

#### EDUCATION

M.A., Economics,  
University of Connecticut  
Storrs, CT, 1967

B.A., Economics,  
University of Connecticut  
Storrs, CT, 1965

#### RECENT PUBLICATIONS

- Bingham, T.H. 2001. "Economic Returns to New Medical Technologies." In *The Advanced Technology Program: Assessing Outcomes*, pp. 154–157. C.W. Wessner, ed., Washington, DC: National Academy Press.
- Thurman, W.N., T.J. Fox, and T.H. Bingham. 2001. "Imposing Smoothness Priors in Applied Welfare Economics: An Application of the Information Contract Curve to Environmental Regulatory Analysis." *The Review of Economics and Statistics* 83(3):511–522.

Mr. Bingham has specialized in regulatory analyses of the economics of policies designed to improve the quality of the environment. He has also evaluated the economics of food safety and estimated the social returns to government support of R&D. He has employed microeconomic, financial, and technical modeling, as well as benefit-cost, cost-effectiveness, and economic impact analyses to evaluate alternative policies. He has developed innovative approaches to modeling the economic effects of policies and programs based on microeconomic theory and valuing these effects using applied welfare economics principles. Mr. Bingham has managed many dozen contracts and projects for federal government clients.

Mr. Bingham has 35 years of administrative and technical experience, all with RTI International, leading research programs and conducting analyses of the economic benefits and costs of public policies and programs employing microeconomic analytic methods to support informed decision making.

He has developed and managed research programs, designing and implementing successful competitive strategies to secure funding; hiring and developing an entrepreneurial and professional staff; and providing professionally conducted research products for a set of synergistic research programs. He has developed and contributed to the development of durable administrative systems designed to support the effective performance of research programs.

Mr. Bingham is a member of the American Economic Association and the Association of Environmental and Resource Economists. He authored a book chapter on environmental benefits valuation and has published papers in the *Journal of Environmental Economics and Management*, *Public Finance Quarterly*, and *The Review of Economics and Statistics* and served as a reviewer for professional journals. Mr. Bingham has taught microeconomic theory at North Carolina State University for over 20 years and environmental policy at Duke University and North Carolina State University.

#### KEY PROJECTS

Directed an analysis of the economic benefits of the Clean Water Act. Linked water quality changes to the in-situ, withdrawal, and nonuse value of water resources. Estimated water quality changes for 632,000 of rivers and streams using a national hydrological model. Estimated recreational use support attainment (swimming, fishing, boating, none) impacts of the Act.

Reviewed the U.S. experience with tradable emissions rights. Evaluated design options for the Cap and Trade and the Open Market Trading Rule programs. Contributed to the development of a prototype empirical model to evaluate alternative program designs.

## Experience

Veritas Economic Consulting, Cary, NC  
Senior Consulting Economist

Research Triangle Institute, Research Triangle Park, NC, 1969 to 2004

Assistant Vice President, Health, Social, and Economics Research Unit; Director, Regulatory Economics and Policy Research Center, 2000 to 2004

- Contributed to the management of a research program in regulatory economics, health systems and policy, substance abuse and mental health policy and programs, and crime and justice with a staff of about 200.
- Managed a center with a staff of 40 conducting research in three programmatic areas: environmental and natural resource economics, food and nutrition economics, and technology economics and policy.

Assistant Director, Center for Economics Research; Director, Environmental and Natural Resource Economics Research Program, 1986 to 2000

- Contributed to the management of a broad research program in environmental, health, and food economics with a staff of 40–60. Managed a program with a staff of 15 conducting research in environmental and natural resource economics.

Senior Economist and Director, Environmental and Natural Resource Economics Research Program, 1980 to 2000

- Responsible for the effective performance of a research program of 10–16 staff focused on conducting analyses of the economic benefits and costs of policies and programs designed to protect and improve the quality of the environment for federal government clients employing microeconomic analytic methods and applied welfare economics principles. Responsible for creating an environment that promotes the growth of the program and of the career development of the program staff including the development of the next generation of management and scientific leaders.

Senior Economist and Supervisor, Environmental Economics Section, 1974 to 1980

- Developed an entrepreneurial research program focused on the intersection of economics and the quality of the environment. Recruited, supervised, and mentored a small staff supporting their projects, business development and marketing, and professional growth and scientific stature activities. Conducted a personal research program on the use of economic instruments to protect and improve the quality of the environment.

Economist, Operations Research and Economics Division, 1969 to 1974

- Managed and contributed to proposals to clients to evaluate the economic impact of environmental regulations. Developed economic models to simulate the impact of the regulations on the performance of economic systems.

## Areas of Specialization

*Innovative Instruments for Environmental Quality Management*

- Conducted the first study of the potential costs and effectiveness of a national charge on sulfur emissions with an economics-engineering model constructed for the analysis. Developed estimates of the cost of introducing, modifying, and enforcing three least-cost air quality attainment policies: optimal direct control, emission charges, and emission

rights. Conducted policy analyses of the allocative and distributional effects of emission charges, rights, and regulations.

- Reviewed the U.S. experience with tradable emissions rights. Evaluated design options for the Cap and Trade and the Open Market Trading Rule programs. Contributed to the development of a prototype empirical model to evaluate alternative program designs. The model simulates firm behavior under marketable permit programs and projects the region-, market- and source-level outcomes and economic welfare associated with alternative configurations of either an emissions or ambient permit system based on user selection of available design features. It projects the price and trading volume of permits for each year over the selected time period and the trading flows across the individual sources in addition to the abatement costs, aggregate emissions, and air quality at each receptor.
- Conducted a review of the worldwide experience with pollution charges. Gathered data on the experience of the Czech Republic with charges and their program for environmental protection. Evaluated the rationale for using charges and identified the design options and information requirements of alternative emissions charge policies for the Czech Republic and presented results to government officials.
- Examined the potential for using externality charges and user charges to efficiently allocate urban water resources and manage water quality in Indonesia. Interviewed governmental officials in several cities on Java. Gathered data and information to provide a comprehensive characterization of the Indonesian urban water-wastewater system and identified the linkages between human behavior and system performance. Proposed the institution of a price system for more effectively managing Indonesia's urban water resources and presented results to government officials.
- Developed a set of experiments for evaluating the characteristics of nonmarket environmental policies and presented a seminar on the experiments and environmental policymaking at the Central Asian Regional Workshop in Tashkent, Uzbekistan.
- Estimated the distributional effects of a producer disposal charge. Examined the impact of packaging taxes and regulations on the prices of packaged consumer products, on economic welfare, and on packaging and natural resource consumption. Analyzed the energy and economic impacts of national legislation requiring minimum deposits on all beer and soft drinks. Testified on the beverage container issue before the Consumer Subcommittee of the U.S. Senate Committee on Commerce, Science and Transportation.
- Supervised and contributed to the analysis of an experimental examination of user charges for municipal solid waste management services. Reviewed the case for and experience with user charges for municipal services. Selected a city for demonstration of the concept. Designed the price system and the data collection methods. Developed a statistical design for evaluating system. Collected data on residential customers' solid waste management practices for both the experimental (quantity-based charge system) and control (traditional, no charge) solid waste management systems. Directed the development of data files for econometric analysis.
- Contributed to an analysis of an effluent charge based on the toxicity of pollutant discharges. Examined possible methods for creating toxic-equivalent measures. Estimated the revenue potential and cost to industry of alternative charge rates.

#### *Economic Impact of Environmental Policies and Programs*

- Contributed to the development of an empirical multimarket model of the pulp and paper industry to estimate the economic effect of environmental policies on the industry and its consumers. Econometrically estimated production costs for 600 mills without

regulations. Used engineering cost estimates to develop with-regulation costs. Developed an innovative market model to project the effect of cost changes on the prices and quantities of 37 paper commodities and on the economic viability of each mill. Used applied welfare economics principles to value the projected reallocation of resources.

- Utilized the principles of applied welfare economics to evaluate the potential economic effects of nonpoint source water pollution regulations for forests in coastal areas. Developed engineering cost estimates to compute the costs of improved facility management practices. Developed a joint product, competitive market model for forest products with coastal-area, noncoastal-area, and foreign suppliers. Computed the effect of controls on the prices and quantities of forest products. Utilized market adjustments to compute the aggregate economic welfare effects.
- Estimated the economic impacts of regulations of coke oven emissions using an econometric model of the demand for steel and coke and a detailed engineering cost model of coke supply. Directed a study of the potential economic effects and costs of asbestos air pollution regulations. Utilized a partial-equilibrium multimarket model of the asbestos products industry and a model of capital stock retirement and replacement decisions. Developed an engineering/economic and market model of the nation's hazardous waste management industry. Estimated the economic impacts of environmental regulations on the industry.

#### *Cost-Price Transmission of Public Policies*

- Designed and implemented an input-output model of consumer prices for estimating the impacts of government intervention in intermediate markets on the prices of consumer products. Estimated the distributional implications of alternative methods of financing the nation's highway system by income class using the input-output model of product price interrelationships. The taxes examined included gasoline tax, registration fees, and weight-mileage taxes.

#### *Economic Benefits of Governmental Policies and Programs*

- Directed an analysis of the economic benefits of the CWA. Linked water quality changes to the in-situ, withdrawal, and nonuse value of water resources. Estimated water quality changes for 632,000 of rivers and streams using a national hydrological model. Estimated recreational use support attainment (swimming, fishing, boating, none) impacts of the Act. Estimated the recreational and nonuse benefits of the Act using results from a contingent valuation study.
- Contributed to studies of the cost of natural resource damages from marine oil spills. Addressed both user and nonuser damages. Evaluated costs to recreational and commercial users of the environment. Conducted studies of hazardous waste site reclamation and redevelopment efforts in England, Wales, Sweden, The Netherlands, and Germany.
- Convened a panel of experts on nonmarket valuation of water resources. Moderated meeting to examine alternative approaches to developing willingness-to-pay/accept estimates. Developed an agenda for research to close gaps between economic theory and empirical estimation. Directed an analysis of the benefits of the urban wet weather management program. Conducted a seminar on water quality benefits valuation. Contributed to the development of a framework for estimating the benefits of the effluent guidelines program.

- Estimated the distribution of the benefits and costs of Superfund site cleanup across income classes. Contributed to the development of an estimate of the averted health care expenditures and of the averted productivity losses from Superfund site cleanup using Monte Carlo analysis.
- Contributed to the estimation of the benefits and costs of nutrition labeling. Evaluated the health effects from changes in product offerings and in consumption patterns. Estimated the costs of food testing and labeling.
- Contributed to the estimation of the social benefits of new health technologies funded by the federal government. Estimated the displacement of defender technologies and the cost-effectiveness of the new technologies. Estimated the direct cost savings and the changes in patient welfare using applied welfare economics principles.

### International Assignments

- Indonesia, Czech Republic, Uzbekistan, England, Wales, Sweden, The Netherlands, Germany, and India.

### Professional Associations and Contributions

- American Economic Association
- Association of Environmental and Resource Economists
- For EPA, reviewed grant proposals for conducting economic analysis studies and provided written assessments of the proposals. Served as a peer-reviewer of professional journals and books. Journals for which referee services have been provided include the Journal of Environmental Economics and Management, Public Finance Quarterly, and Land Economics. Member of the Board of Directors, Association of Environmental and Resource Economists and organizer of workshop on the benefits transfer approach.

### Publications

#### Books and Book Chapters

Bingham, T.H. 2001. "Economic Returns to New Medical Technologies." In *The Advanced Technology Program: Assessing Outcomes*, pp. 154–157. C.W. Wessner, ed., Washington, DC: National Academy Press.

Bingham, T.H. 1988. "Social Values and Environmental Quality." In *Man's Role in Changing the Global Environment*, D.B. Botkin, M.F. Caswell, J.E. Estes, and A.A. Orio, eds. New York: Academic Press.

Bingham, T.H. 1977. "Allocative and Distributional Effects of a Disposal Charge on Product Packaging." In *Resource Conservation*, D. Pearce and I. Walter, eds. New York, New York: New York University Press. Also in *Proceedings of the Bellagio Symposium on the International and Comparative Economic Dimensions of Waste Recycling and Reuse*, Bellagio, Italy, November 1976.

Bingham, T.H., and B.S. Lee. 1976. "Estimates of the Interrelationships Between Consumer Expenditures and Natural Resource Consumption." In *Applications of Computer Methods in the Mineral Industry*, R.V. Ramani, ed. New York, New York: American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc. Also in *Proceedings of the Fourteenth Symposium of the American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc.*, Pennsylvania State University.

## Peer-Reviewed Journal Articles

Thurman, W.N., T.J. Fox, and T.H. Bingham. 2001. "Imposing Smoothness Priors in Applied Welfare Economics: An Application of the Information Contract Curve to Environmental Regulatory Analysis." *The Review of Economics and Statistics* 83(3):511–522.

Bingham, T.H., D.W. Anderson, and P.C. Cooley. 1987. "Distribution of the Generation of Air Pollution." *Journal of Environmental Economics and Management* 14(1):30-40.

Bingham, T.H., D.W. Anderson, and P.C. Cooley. 1985. "Distributional Implications of the Highway Revenue Act." *Public Finance Quarterly* 13(1):99–112.

Bingham, T.H., C. Youngblood, and P.C. Cooley. 1983. "Conditionally Predictive Supply Elasticity Estimates: Secondary Materials Obtained from Municipal Residuals." *Journal of Environmental Economics and Management* 10(2):166–179.

## Other Journal Articles

Bingham, T.H., and T.J. Fox. 1999. "Model Complexity and Scope for Policy Analysis." *Public Administration Quarterly* 23(3).

## Conference Proceedings

Bingham, T.H. 1991. "Economic Implications of a Marketable Permit Policy for Old Newspapers." In *Proceedings of the International Symposium on Research Developments for Improving Solid Waste Management*. Cincinnati, Ohio: Air and Waste Management Association.

## Monographs

Bingham, T.H. 1994. "Application of Residuals Charges for Achieving Environmental Quality Objectives in the Czech Republic." Prepared for the Harvard Institute for International Development. October.

## Presentations

Martin, S.A., and T.H. Bingham. 1998. "The Impact of R&D Incentives on Economic Welfare." Presented at the APEC Symposium: Evaluation of S&T Programmes Among APEC Member Economies, Washington, DC, December 2–4.

Fox, T.J., T.H. Bingham, W. Thurman, and B.C. Murray. 1995. "Economic Analysis of Air and Water Pollution Regulations: U.S. Pulp, Paper, and Paperboard Industries." Presented at the Canadian Pulp and Paper Association's Environment Conference, Halifax, Nova Scotia, October 23-26.

Bingham, T.H. 1995. "Pricing Solid Waste Management Services." North Carolina Recycling Association Conference, Greensboro, North Carolina, April 3.

Bingham, T.H. 1994. "Application of Residuals Charges for Achieving Environmental Quality Objectives in the Czech Republic." Prepared for the Harvard Institute for International Development, October.

Bingham, T.H., T.J. Fox, J.E. Woodman, and E.S. Newbold. 1993. "Economic Analysis of Coastal Nonpoint Source Water Pollution Controls: Forestry." Presented at the Southern Forest Economics Meeting, Duke University, Durham, North Carolina, April.

Bingham, T.H. 1992. "Environmental Policy and the Role of Information." Presented at the Second Annual Canada-U.S. Environmental Regulation Conference, Toronto, Ontario, March 24.

Bingham, T.H. 1991. "Economic Implications of a Marketable Permit Policy for Old Newspapers." Presented at the International Symposium on Research Developments for Improving Solid Waste Management, Air and Waste Management Association, Cincinnati, Ohio, February.

Bingham, T.H., and W.H. Desvousges. 1989. "The Noxious Facilities Siting Dilemma: A Review of the Economic Issues." Presented at the Sino-U.S. Bi-National Conference on Environmental Protection and Social Development, Taipei, Taiwan, August 20–25.

Bingham, T.H., and G. Kingsbury. 1985. "Reclamation and Redevelopment of Uncontrolled Hazardous Waste Sites: European Case Studies." Presented at the U.S. Environmental Protection Agency Eleventh Annual Research Symposium, Cincinnati, Ohio, May.

Bingham, T.H., D.W. Anderson, and P.C. Cooley. 1982. "The Impact on Households' Incomes of Highway Financing Alternatives." Presented at the Sixty-First Annual Meeting of the Transportation Research Board, January.

Bingham, T.H. 1977. "Distributional Implications of a Product Charge." Presented at the Southern Economic Association meeting, New Orleans, Louisiana, November.

Bingham, T.H. 1977. "Economic Incentives and Environmental Quality." Presented at the Environmental Industry Conference, Washington, DC, February.

Bingham, T.H. 1974. "A Projection of Effectiveness and Costs of a National Tax on Sulfur Emissions." Presented at the Sixty-Seventh Air Pollution Control Association annual meeting, Denver, Colorado, June.

Bingham, T.H. 1972. "Use of Economic Incentives to Promote the Reuse of Certain Pesticide Containers." Presented at the National Conference on Pesticide Containers, New Orleans, Louisiana, December.