

## Charles B. Sims

Howard H. Baker Jr. Center for Public Policy  
Department of Economics  
University of Tennessee - Knoxville  
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### RESEARCH INTERESTS

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**General:** Applied Microeconomic Theory

**Focus:** Management of natural resources, coupled human and natural systems, risk and uncertainty, invasive species, endangered species, public land management, optimal control theory, dynamic programming, real options, computable general equilibrium

### PROFESSIONAL EXPERIENCE

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- 2013-Present Faculty Fellow, Howard H. Baker Jr. Center for Public Policy
- 2013-Present Assistant Professor, Department of Economics, University of Tennessee – Knoxville
- 2009-2013 Assistant Professor, Department of Applied Economics, Utah State University
- 2006-2009 Graduate Teaching and Research Assistant, Department of Economics and Finance, University of Wyoming
- 2004-2005 Research Associate, Department of Forestry, Wildlife & Fisheries, University of Tennessee - Knoxville
- 2002-2004 Graduate Teaching and Research Assistant, Department of Forestry, Wildlife & Fisheries, University of Tennessee - Knoxville

### EDUCATION

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- PhD Economics University of Wyoming, 2009  
Advisors: David Finnoff and Jason Shogren
- M.S. Forestry (Environmental Policy minor) University of Tennessee-Knoxville, 2004  
Advisor: Donald G. Hodges
- B.S. Forest Resource Management University of Tennessee-Knoxville, 2001

### RESEARCH

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#### *Peer-reviewed Journal Articles*

- Sims, C., D. Finnoff. 2016. Opposing irreversibilities and tipping point uncertainty. *Journal of the Association of Environmental and Resource Economists* forthcoming.
- Burton, M., C. Sims. 2016 Understanding Railroad Investment Behaviors, Regulatory Processes, and Related Implications for Efficient Industry Oversight. *Review of Industrial Organization* forthcoming.
- Liu, Y., C. Sims. 2016. Spatial-dynamic externalities and coordination in invasive species control. *Resource and Energy Economics* 44: 23-38.

- Sims, C.**, D. Finnoff, J. Shogren. 2016. Bioeconomics of Invasive Species: Using Real Options Theory to Integrate Ecology, Economics, and Risk Management. *Food Security* 8(1): 61-70.
- Aadland, D., **C. Sims**, D. Finnoff. 2015. Spatial Dynamics of Optimal Management in Bioeconomic Systems. *Computational Economics* 45(4): 545-577.
- Sims, C.**, D. Aadland, J. Powell, D. Finnoff, and B. Crabb. 2014. Complementarity in the provision of ecosystem services reduces the cost of mitigating amplified natural disturbance events. *Proceedings of the National Academy of Sciences* 111(47): 16718-16723.
- Caplan, A. J., **C. Sims**, E. Anderson. 2014. Measuring the Environmental Cost of Hypocrisy, *Ecological Economics* 108: 124-135.
- Sims, C.**, D. Finnoff. 2013. When is a “wait and see” approach to invasive species justified? *Resource and Energy Economics* 35(3): 235-255.
- Sims, C.** 2013. Influencing natural forest disturbance through timber harvesting: Tradeoffs among disturbance processes, forest values, and timber condition. *American Journal of Agricultural Economics* 95(4): 992-1008.
- Sims, C.**, D. Aadland, D. Finnoff, J. Powell. 2013. How Ecosystem Service Provision Can Increase Forest Mortality from Insect Outbreaks. *Land Economics*. 89(1): 154-176.
- Sims, C.** 2013. Hypothetical Market Familiarity and the Disconnect Between Stated and Observed Values for Green Energy. *International Journal of Energy Economics and Policy*. 3(1): 10-19.
- Sims, C.**, D. Finnoff. 2012. The role of spatial scale in the timing of uncertain environmental policy. *Journal of Economic Dynamics and Control*. 36(3): 369-382.
- Sims, C.** 2011. Optimal timing of salvage harvest in response to a stochastic infestation. *Natural Resource Modeling* 24(3): 383-408.
- Sims, C.**, D. Aadland, D. Finnoff. 2010. A Dynamic Bioeconomic Analysis of Mountain Pine Beetle Epidemics. *Journal of Economic Dynamics and Control* 34(12): 2407-2419.
- Finnoff, D., C. McIntosh, J. Shogren, **C. Sims**, T. Warziniack. 2010. Invasive Species and Endogenous Risk. *Annual Review of Resource Economics* 2: 77-100.
- Sims C. B.**, D. G. Hodges, J. M. Fly, B. Stephens. 2005. Modeling acceptance of a shuttle system in the Great Smoky Mountains National Park. *Journal of Park and Recreation Administration* 23:25-44.

### **Book Chapters**

- Bossenbroek, J., A. Croskey, D. Finnoff, L. Iverson, S. McDermott, A. Prasad, **C. Sims**, D. Sydnor. “Evaluating the Economic Costs and Benefits of Slowing the Spread of Emerald Ash Borer in Ohio and Michigan”, in Keller, R., Cadotte, M., Sandiford, G. (Eds.), *Invasive Species in a Globalized World*. University of Chicago Press 2014.

Finnoff, D., R. Horan, S. McDermott, **C. Sims**, J. Shogren. Economic Control of Invasive Species, in Levin, S (Ed.), Encyclopedia of Biodiversity 2<sup>nd</sup> Ed. Elsevier/Academic Press 2013.

### ***Articles in Submission***

- “Listing and delisting thresholds under the Endangered Species Act” with D. Finnoff, A. Hastings, J. Hochard. Revise and resubmit.
- “Rational and unpredictable epidemics” with David Finnoff and Suzanne O’Regan. Under review.
- “Untangling the role of stochasticity, uncertainty, and learning in the economics of resources and environmental management” with Jacob LaRiviere, David Kling, Jim Sanchirico, and Michael Springborn. Revise and resubmit.
- “Taking One For the Team: Is collective action more responsive to ecological change?” with David Finnoff and Jason Shogren. Under review.
- “Wolf and Elk Management in a Spatial Predator-Prey Ecosystem” with David Aadland, David Finnoff, and Jacob Hochard. Under review.

### ***Working Papers***

- “Assessing the economic tradeoffs between prevention and suppression of forest fires” with David Finnoff, Suzanne Lenhart and Betsy Heines
- “Decentralized Management of Endangered Populations under the Threat of Federal Protection: A Game Theory Analysis” with David Aadland, David Finnoff, and Jacob Hochard
- “Investing in self-protection against infectious disease” with David Finnoff
- “The effect of group size and earned income in provision point public goods” with Brian Enchelmeyer, Chris Kennedy, and Jason Shogren
- “Prioritizing invasive species control based on expected bioeconomic rates of return” with David Finnoff

### ***Research in Progress***

- “Investment in species conservation assets as a framework for quantitative guidance of the Endangered Species Act” with David Finnoff and Alan Hastings
- “Managing infectious disease spread” with David Aadland
- “Water conservation investments in the face of climate change uncertainty” with Sarah Null and Augustina Odame
- “Cost of capital and revenue adequacy in the railroad industry” with Mark Burton
- “Fuel switching in electricity generation” with Scott Holladay and Rebecca Davis
- “Agent-based modeling and distributed electricity generation” with Islam El-Adaway
- “Can uncertainty and irreversibility explain the energy efficiency paradox?”

### ***Conference and Workshop Presentations***

Assessing the economic tradeoffs between prevention and suppression of forest fires.

- Southern Economic Association Annual Meeting: New Orleans, LA, November 21-23, 2015.
- Taking one for the team: Is collective action more responsive to ecological change? BIOECON Annual Conference: Cambridge, UK, September 13-15, 2015.
- Rational and unpredictable epidemics. Thresholds and Tipping Points in Dynamic Economic Systems Workshop: Knoxville, TN, July 27-28, 2015.
- Rational stochastic epidemics and the optimal timing of public health interventions. Association of Environmental and Resource Economists (AERE) Summer Conference: San Diego, CA, June 3-5, 2015.
- Opposing irreversibilities in environmental policy: Avoiding the point of no return or delaying the inevitable. Southern Economic Association Annual Meeting: Atlanta, GA, November 22-24, 2014.
- Taking one for the team: Is collective action more responsive to ecological change?. Fifth World Congress of Environmental and Resource Economists, Istanbul, Turkey, June 28-July 2, 2014.
- Linking listing and delisting decisions under the Endangered Species Act: A case study of gray wolves in the Northern Rocky Mountains. Fifth World Congress of Environmental and Resource Economists, Istanbul, Turkey, June 28-July 2, 2014.
- Linking listing and delisting decisions for endangered species: A case study of gray wolves in the Northern Rocky Mountains. Western Agricultural Economics Association Conference: Colorado Springs, CO, June 22-24, 2014.
- Water-saving infrastructure investment under hydrologic uncertainty. University of Tennessee Watershed Symposium: Knoxville, TN, February 18, 2014.
- How Ecosystem Service Provision Can Increase Forest Mortality from Insect Outbreaks. China-US Joint Research Center for Ecosystem and Environmental Change: Gatlinburg, TN, Nov 18-19, 2013.
- Opposing irreversibilities in environmental policy: Avoiding the point of no return or delaying the inevitable. Association of Environmental and Resource Economists (AERE) Summer Conference: Banff, Alberta, Canada, June 6-8, 2013.
- Spatial dynamics of mountain pine beetle outbreaks with optimal forest management. BESTNet Workshop: Princeton, NJ, April 25-26, 2013.
- How Ecosystem Service Provision Can Increase Forest Mortality from Insect Outbreaks. Ecosystem Services Partnership Conference: Portland, OR, July 31-August 4, 2012.
- Spatial dynamics of optimal management in a predator-prey system: An application to mountain pine beetle epidemics. Association of Environmental and Resource Economists (AERE) Summer Conference: Asheville, NC, June 3-5, 2012.
- Salvage harvesting following natural forest disturbance: The importance of disturbance characteristics in gauging management response. Association of Environmental and Resource Economists (AERE) Summer Conference: Asheville, NC, June 3-5, 2012.
- Optimal Timing of Salvage Harvest in Response to Stochastic Infestation. 86<sup>th</sup> Annual

- Conference of the Western Economics Association: San Diego, CA, June 29-July 3, 2011.
- The Role of Spatial Scale in the Timing of Uncertain Environmental Policy. American Economic Association Annual Meeting: Denver, CO, January 7-9, 2011.
- The Role of Environmental and Economic Uncertainty in Invasive Species Control Decisions. Fourth World Congress of Environmental and Resource Economists: Montreal, Canada, June 28-July 2, 2010.
- Optimal Control of a Bounded Invasive Species Diffusion Process: An Application to the Emerald Ash Borer. Fourth World Congress of Environmental and Resource Economists: Montreal, Canada, June 28-July 2, 2010.
- Optimal Stochastic Environmental Policies: Implications for Invasive Species Management. 52<sup>nd</sup> Annual Conference on Great Lakes Research: Toledo, OH, May 18-22, 2009.
- The Disconnect Between Hypothetical and Observed Values for green energy in Tennessee. Int. Symposium on Society and Resource Management: Park City, UT. June 17-21, 2007.
- Assessing the Role of Outdoor Recreation in Rural Economic Development: A Case Study for the Obed Wild and Scenic River, TN. Int. Symposium on Society and Resource Management: Keystone, CO, June 2-6, 2004.
- Linking outdoor recreation and economic development: A feasibility assessment of the Obed Wild and Scenic River, Tennessee. Social Aspects and Recreation Research Symposium: San Francisco, CA, Feb 4-6, 2004.
- Travel cost modeling of the demand for rock climbing: An application to the Obed Wild and Scenic River. Annual Southern Forest Economics Workshop: St. Augustine. March 14-16, 2004.
- Modeling the demand for and value of OHV recreation in Tennessee. Southern Forest Economics Workers Annual Meeting: New Orleans, LA, March 17-18, 2003
- Demand and value of off-highway vehicle recreation in Tennessee. Annual Southern Forest Economics Workshop: New Orleans, LA, March 17-18, 2003.

### ***Invited Presentations and Seminars***

- Opposing irreversibilities and tipping point uncertainty. Michigan State University: East Lansing, MI, January 2016.
- Economic Potential of South Knoxville's Urban Wilderness. Great Smoky Mountains Regional Greenways Council: Knoxville, TN, January 2016.
- Linking listing and delisting decisions under the Endangered Species Act: A case study of gray wolves in the Northern Rocky Mountains. Appalachian State University: Boone, NC, February 2015.
- A Transitioning Energy Landscape in Tennessee. Tennessee Gas Association Conference: Knoxville, TN, October 2014.
- Taking one for the team: Is collective action more responsive to ecological change?. Environmental Protection Agency: Washington, D.C., September 17, 2014.

Complementarity in the provision of ecosystem services reduces the cost of mitigating amplified natural disturbance events. Virginia Tech: Blacksburg, VA, May 2014.

Complementarity in the provision of ecosystem services reduces the cost of mitigating amplified natural disturbance events. Environmental Sciences Division, ORNL: Oak Ridge, TN, April 2014.

How ecosystem service provision can increase forest mortality from insect outbreaks. USDA Forest Service: Asheville, NC, November 2013.

When is a “wait and see” approach to invasive species justified? University of Tennessee: Knoxville, TN, January 2013

Spatial dynamics of mountain pine beetle epidemics with optimal forest management. Colorado State University: Fort Collins, CO, January 2013.

Regional Economic Impacts of Coal Bed Methane Water Management in the Powder River Basin of Wyoming. Utah State University: Logan, UT, November, 2010.

A Dynamic Economic Analysis of the Mountain Pine Beetle Epidemic. University of Tennessee Natural Resource Policy Center Seminar Series: Knoxville, TN, August, 2008.

### ***White Papers, Reports and Trade Publications***

**Sims, C.**, Bongkyun Kim, and Jean Peretz. 2016. An Energy Scorecard for the American States: States ranked according to energy, economy, and environment. The Howard H. Baker Center for Public Policy, Baker Reports 3.16

**Sims, C.** 2016. The Paris Climate Change Talks: What Did the President Promise and When Did He Promise It? The Howard H. Baker Center for Public Policy, Policy Brief 1.16.

**Sims, C.** 2015. The Second Coming of the U.S. as an Oil Powerhouse. *Oil and Gas Monitor*, November 15, 2015.

**Sims, C.** 2015. How Did Tennessee Fare in the Final Clean Power Plan? The Howard H. Baker Jr. Center for Public Policy, On Point 3:15.

**Sims, C.**, Rebecca Davis, Bongkyun Kim. 2015. Economic Potential of South Knoxville’s Urban Wilderness. The Howard H. Baker Jr. Center for Public Policy, White Paper 2:15.

Murray, M. **C. Sims**, Rebecca Davis, Bongkyun Kim. 2015. Coal Mining and Tourism as Engines of Economics Development for Campbell County and Claiborne County, Tennessee. The Howard H. Baker Jr. Center for Public Policy, Project Report 2:15

Murray, M., **C. Sims**, B. Tonn, J. Peretz, J. Wallace, R. Hansen, L. Alvarado. 2014. A Profile of the Energy Sector in Tennessee. The Howard H. Baker Jr. Center for Public Policy, Project Report 2:14.

**Sims, C.** 2014. What Are the Benefits of Federal Carbon Policies and How Well Do We Know Them? The Howard H. Baker Jr. Center for Public Policy, Policy Brief 3.14

**Sims, C.** 2013. Modeling the coupled nature of forest management and forest

- disturbance regimes impacted by climate change. Final Report submitted to Utah Agricultural Experiment Station.
- Jackson-Smith, D. et al. 2012. WSC Category 1 – Hydrologic and Ecological Impacts of Changes in Human Water Resources Management in Response to Climate Change and Urbanization. Final Report submitted to the National Science Foundation.
- Coupal, R., D. Finnoff, **C. Sims**. 2008. Regional Economic Impacts of Coal Bed Methane Water Management. Final Report submitted to the Department of Energy.
- Hodges, D. G., **C. B. Sims**, and A. R. Wells. 2008. Incorporating non-timber objectives in forest management planning on private lands: A case study of the Cumberland Plateau, Tennessee, USA. In: Managerial Economics and Accounting in an Evolving Paradigm of Forest Management, Proceedings of International Symposium organized by IUFRO Group 4.05.00, S. Kant, W. Tzschukpe, J-L Peyron, and H. A. Jobstl, eds. Schriftenreihe der Hochschule für Forstwirtschaft Rottenburg, Band Nr. 22. Pp. 174-185.
- Sims, C. B.** and D. G. Hodges. 2004. Use, Demographics, and Economic Impacts of Rock Climbing in the Obed Wild and Scenic River Area. Final Report submitted to National Park Service.

#### ***Funded Grants and Contracts***

Title: A Hedonic Analysis of the Economic Value of Open Space

Funding Source: Tennessee Advisory Commission on Intergovernmental Relations

Award: \$49,854

Duration: 3/15-8/26

Title: UCOR Economic Impact Study

Funding Source: URS | CH2M Oak Ridge

Award: \$20,962

Duration: 4/15-8/15

Title: 2015-2016 Energy and Environment Forum

Funding Source: Institute for Secure and Sustainable Environment

Award: \$4,000

Duration: 8/15-5/16

Title: Understanding the impact of distributed generation on TVA

Funding Source: TVA

Award: \$25,000

Duration: 9/15-9/16

Title: DOE Economic Impact Study

Funding Source: Department of Energy

Award: \$15,000  
Duration: 8/14-5/14

Title: TN State Energy Plan  
Funding Source: TN State Budget  
Award: \$19,000  
Duration: 5/14-11/14

Title: Coal versus Tourism as Engines of Growth for Tennessee Counties  
Funding Source: TN Department of Environment and Conservation  
Award: \$60,000  
Duration: 6/14-11/14

Title: Energy and Environment Indicator Series  
Funding Source: TVA  
Award: \$10,000

Title: iUTAH – innovative Urban Transitions and Aridregion Hydro-sustainability  
Funding Source: National Science Foundation  
Award: \$20,000,000  
Duration: 8/1/12-8/1/17

Title: Managing Interacting Disturbances to Achieve Multiple Environmental Objectives  
Funding Source: USDA Forest Service, Western Wildlands Environmental Threat  
Assessment Center  
Award: \$43,270  
Duration: 9/1/12-8/30/14

Title: Measuring the Environmental Cost of Hypocrisy  
Funding Source: Utah Agricultural Experiment Station Competitive Grants Program  
Award: \$19,761  
Duration: 6/1/12-6/30/14

Title: Modeling the Coupled Nature of Forest Management and Forest Disturbance  
Regimes Impacted by Climate Change  
Funding Source: Utah Agricultural Experiment Station Competitive Grants Program  
Award: \$19,040  
Duration: 6/1/11-6/30/13

Title: Hydrologic and Ecological Impacts of Changes in Human Water Resource  
Management in Response to Climate Change and Urbanization.  
Funding Source: National Science Foundation Water Sustainability and Climate Program

Award: \$149,943

Duration: 9/1/10 - 9/1/11

Title: Use, Demographics, and Economic Impacts of Rock Climbing in the Obed Wild and Scenic River Area.

Funding Source: National Park Service

Award: \$12,465

Duration: 9/01/02 – 8/31/04.

***Other Funded Research***

Title: The Role of Forest Management Objectives in Mountain Pine Beetle Outbreaks.

Funding Source: Utah Agricultural Experiment Station

Award: \$14,000

Duration: 11/1/09-11/1/14

**TEACHING**

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***University of Tennessee***

ECON 512 Microeconomic Theory II

ECON 677 Environmental and Natural Resource Economics

ECON 362 Environmental and Natural Resource Policy

ECON 693 Baker Center Interdisciplinary Forum

***Utah State University***

APEC 6500 Natural Resource Economics

APEC 5560 Natural Resource and Environmental Economics

APEC 6510 Environmental Economics

APEC 7500 Natural Resource Economics

APEC 7360 Mathematical Economics II

***University of Wyoming***

ECON 440 Environmental Economics

**SERVICE**

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***Professional Service***

*Referee for the following journals:*

Proceedings of the National Academy of Sciences, Journal of Public Economics, Journal of the Association of Environmental and Resource Economists, Journal of Economic Behavior and Organization, Journal of Economic Dynamics and Control, Land Economics, Journal of Environmental Economics and Management, American Journal of Agricultural Economics, Ecological Economics, Resource and Energy Economics, Western Economics Forum, Environmental and Resource Economics, Journal of Agricultural and Resource Economics, Natural Resource Modeling, Forest Policy and

Economics, Futures, Water Economics and Policy, Ecology Letters, Ecological Modelling, Society and Natural Resources, European Journal of Operational Research, Journal of Bioeconomics

Reviewer: National Science Foundation (US), Biotechnology and Biological Sciences Research Council (UK)

Discussant: Fifth World Congress of Environmental and Resource Economists, 2011  
Annual Conference of the Western Economics Association, Fourth World Congress of Environmental and Resource Economists

Award Committee: Western Agricultural Economics Association

Conference participant reviewer: Agricultural and Applied Economics Annual Meetings, Association of Environmental and Resource Economists Meetings

### ***Departmental Service***

#### *Graduate Students Supervised as Advisor and Current Employment*

Rebecca Davis (PhD Economics –Tennessee), anticipated completion fall 2017

Augustina Odame (PhD Economics – Utah State), completed August 2015, Post-doctoral Researcher - Yale

Yanxu Liu (PhD Economics – Utah State), completed April 2013, Assistant Professor – Bethel College

Abhinav Pathak (MS Applied Economics – Utah State), completed May 2011, Chase Bank

#### *Graduate Committees*

Lassina Coulibaly (PhD Economics – Utah State)

#### *Undergraduate Research Mentor*

Christina Gore (Economics)

#### *Departmental Committees*

Graduate policies committee, Univ. of TN

Microeconomics qualifier committee, Univ. of TN

Search committee; Univ. of TN

Graduate admissions committee, Utah State

ENR degree planning committee, Utah State

Search committee; Assistant professor in regional economics, Utah State

### ***University Service***

#### *Graduate Committees*

Binod Chapagain (PhD Forestry, Wildlife & Fisheries – Tennessee)

Mohamed Eid (PhD Civil and Environmental Engineering – Tennessee)

Betsy Heines (PhD Mathematics – Tennessee)

Evan Markel (PhD Agricultural and Resource Economics – Tennessee)  
Ann Alexander (PhD Sociology – Utah State)  
Anvar Suyundikov (MS Applied Economics – Utah State)  
Jarod Dunn (MS Applied Economics – Utah State)  
Elliot Anderson (MS Applied Economics – Utah State)

*Undergraduate Research Mentor*

Patrick Mckenzie (Ecology & Evolutionary Biology)

Independent study course on learning in economic models for Bredesen Center students

Organizing committee: Energy Efficiency, Conservation & Low-Income Households

Workshop, Univ. of TN, 2016

Organizing committee: Workshop on Threshold and Tipping Points, Univ. of TN, 2015

Judge: Baker Center Policy Challenge, Univ. of TN, 2015

Judge: Cynthia B. Peterson Poster Competition, Univ. of TN, 2015

Panelist: Journalist Workshop on Clear Air Policies, Univ. of TN, 2014

Organizing committee: Energy and Environment Forum, Univ. of TN, 2014-current

Assistant Professor Panelist: New Faculty Orientation, Univ. of TN, 2014

Panelist: 3<sup>rd</sup> Year Review Panel, Utah State, 2012

Graduate Student Poster Judge: Spring Runoff Conference, Utah State, 2012

Search committee: Department of Sociology, Social Work, and Anthropology, Utah State

Assistant Professor Panelist: New Faculty Teaching Academy, Utah State, 2011

HONORS AND AWARDS

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U. of Tennessee Quest Scholar of the Week, October 9, 2105

U. of Wyoming Best Economics PhD Graduate Student Award, 2009

U. of Wyoming William E. Morgan Graduate Award, 2008

U. of Wyoming Environment and Natural Resources Plummer Scholarship, 2005-2008

AFFILIATIONS AND MEMBERSHIPS

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American Economic Association

Association of Environmental and Resource Economists

Western Economics Association

Southern Economics Association