ARE Faculty Profile: C.-Y. Cynthia Lin

C.-Y. Cynthia Lin
Assistant Professor
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Cynthia Lin has been an assistant professor at University of California, Davis since 2006, with a joint appointment in the agricultural and resource economics department and the environmental science and policy department. Cynthia is also a research associate of the Harvard University John F. Kennedy School of Government and the Fossil Fuels Tract Director of the Sustainable Transportation Energy Pathways Program of the UC Davis Institute of Transportation Studies.

Cynthia is one of the seven economists selected to serve on the California State Controller's Council of Economic Advisors. As part of her work on the council, she has been proposing an increase in the California gasoline tax. The optimal gas tax for California is the subject of a paper she is writing with graduate student Lea Prince.

Cynthia's fields of interest are environmental and natural resource economics, energy economics, industrial organization, and applied microeconomics. Among her current areas of research are the petroleum industry, renewable energy, natural resources, environmental regulation, and air quality. She enjoys working on projects that are technically sound, innovative, challenging, and that are of interest to academics, business practitioners and policy-makers alike.

Cynthia received her bachelor's degree, *summa cum laude*, in Environmental Science and Public Policy from Harvard College in 2000. Her undergraduate atmospheric chemistry thesis on trends in ozone smog was awarded a Thomas Temple Hoopes Prize and culminated in two journal publications. She was elected to Phi Beta Kappa in her junior year.

Cynthia received her Ph.D. in Economics from Harvard University in 2006. Her graduate honors include a Repsol YPF–Harvard Kennedy School Pre-Doctoral Fellowship in energy policy, the Stone Fellow Award for the Best Paper Written by a Doctoral Student in Environmental and Resource Policy, and the International Society for New Institutional Economics Award for the Best Ph.D. Dissertation.

For her Ph.D. dissertation, Cynthia analyzed the investment timing game played by petroleum-producing firms in the Gulf of Mexico. When individual petroleum-producing firms make their exploration and development investment timing decisions, positive information externalities and negative extraction externalities may lead them to interact strategically with their neighbors. Her research examines whether these inefficient strategic interactions take place on federal lands in the Gulf of Mexico. In particular, it analyzes whether a firm's production decisions and profits depend on the decisions of firms owning neighboring tracts of land. The empirical approach is to estimate a structural econometric model of the firms' multi-stage investment timing game. Although the model only permits the identification of the net effect of the two countervailing externalities, and not each individually, theory suggests that the importance of the extraction externality relative to the information externality should be greater on small tracts than on large tracts, and the data are consistent with this theory. Also as expected, the externalities intensify as the tract size decreases.

Cynthia is currently working on several research projects. With graduate student David Corderi, she is estimating the social rate of return to research and development in the energy industry. Their model quantifies the positive contribution that lagged R&D has on Total Factor Productivity growth in the manufacturing of coal, petroleum products, and nuclear fuel sector for a number of OECD countries.

With graduate student Wayne Leighty, Cynthia is modeling the economically optimal dynamic oil production decisions for seven production units (fields) on Alaska's North Slope and simulating the impact of tax policy on production rate. Cynthia is also working on a project using spatial econometrics to analyze air pollution externalities. She just started a project analyzing the entry and exit decisions of ethanol plants with graduate student Karen Thome, and a project analyzing the supply and demand of hybrid vehicles with graduate student Joeri de Wit.

In her free time, Cynthia enjoys walking, swimming, reading novels and playing the piano.

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