

TAYLOR K MCKENZIE

U.S. Citizen

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EDUCATION

Ph.D. Economics

Expected: June 2017

University of Oregon, Eugene, OR

Dissertation: Railroads, Regulation, Efficiency, and Competition

Committee: Wesley W. Wilson, Van Kolpin, Jeremy Piger,

Diane Del Guercio, Keaton Miller

M.S. Economics

December 2013

University of Oregon, Eugene, OR

Advisor: Dr. Wesley W. Wilson

B.A. Economics and Mathematics

May 2012

Willamette University, Salem, OR

Summa Cum Laude

Advisors: Dr. Raechelle Mascarenhas and Dr. Peter Otto

WORK EXPERIENCE

Pacific Northwest National Laboratory, National Security Intern

May 2014 - Aug. 2014

Knowledge Discovery and Informatics Group

902 Battelle Blvd

Mentor: Dr. Satish Chikkagoudar

Richland, WA 99354

- Developed a game-theoretic model of inter-organization email traffic and estimated the model and produced simulations using Bayesian methods. Simulations were used to identify risk of cybersecurity threats and develop strategies to mitigate the damage of cyberattacks.

Pacific Northwest National Laboratory, National Security Intern

May 2012 - Aug. 2012

Knowledge Discovery and Informatics Group

902 Battelle Blvd

Mentor: Dr. Courtney Corley

Richland, WA 99354

- Developed methods to predict and interpret trends in social media and implemented those methods in Python and R on PNNL's supercomputing cluster. Also co-authored "SociAL Sensor Analytics: Measuring Phenomenology at Scale."

Pacific Northwest National Laboratory, National Security Intern

May 2011 - Aug. 2011

Knowledge Discovery and Informatics Group

902 Battelle Blvd

Mentor: Dr. Courtney Corley

Richland, WA 99354

- Developed a predictive disease model describing spread of SARS and cholera worldwide and prototyped both models in Python. Also developed estimates for air travel between countries and the effects of various intervention techniques such as airport screening and quarantine.

Pacific Northwest National Laboratory, National Security Intern

May 2010 - Aug. 2010

Knowledge Systems Group

902 Battelle Blvd

Mentors: Dr. Courtney Corley and Carrie Mathews

Richland, WA 99354

- Developed metrics to analyze the effectiveness of biosurveillance systems and models and investigation of economic indicators in nuclear proliferation pathway analysis.

TEACHING EXPERIENCE

Independent Instructor:

- EC 311: Intermediate Microeconomic Theory *Fall 2014*
- EC 360: Issues in Industrial Organization *Fall 2016, Spring 2017*
- EC 390: Problems and Issues in Developing Economies *Fall 2015, Spring 2016*

Teaching Assistant:

- EC 201: Introduction to Microeconomic Analysis *Fall 2012, Spring 2013, Spring 2015*
- EC 202: Introduction to Macroeconomic Analysis *Winter 2013*
- EC 320: Introduction to Econometrics *Fall 2013, Winter 2015*
- EC 428: Behavioral and Experimental Economics *Spring 2014*
- EC 430: Urban and Regional Economics *Spring 2014*
- EC 607: Seminar: Core Macro *Winter 2014*

PUBLICATIONS

- Corley, C.D., C. Dowling, S.J. Rose, and T. McKenzie (2013). SociAL Sensor Analytics: Measuring Phenomenology at Scale. *2013 IEEE International Conference on Intelligence and Security Informatics*, 61-66.
- Corley, C.D., et al, including T. McKenzie (2012). Assessing the Continuum of Event-Based Biosurveillance Through an Operational Lens. *Biosecurity and Bioterrorism 10(1)*, 131-41.

WORKING PAPERS

- McKenzie, Taylor. Markups and Scale Elasticities for Differentiated Railroad Networks (with Wesley W. Wilson).
- McKenzie, Taylor. Decomposing Changes in Productivity Using Bayesian Methods.

WORKS IN PROGRESS

- McKenzie, Taylor. Competitive Pressures and Inefficiency in Allocation.

SKILLS

- Development and implementation of statistical and econometric models in R, Python, Matlab, and Stata.
- Estimation of structural and reduced-form econometric models using classical, time-series, and Bayesian methods.
- Experience working with diverse teams and developing models that synthesize theories and results from a multitude of disciplines.

AWARDS AND RECOGNITIONS

- Ph.D. Research Paper Award from the University of Oregon for “Markups and Scale Elasticities for Differentiated Railroad Networks.” *May 2016*
- Achievement Award from Pacific Northwest National Laboratory. *Aug. 2014*
- Best Paper Award at Institute of Electrical and Electronics Engineers Intelligence and Security Informatics Conference for “SociAL Sensor Analytics: Measuring Phenomenology at Scale.” *June 2013*

- Best First-Year Econometrics Performance Award from the University of Oregon. *June 2013*
- National Security Directorate Outstanding Performance Award from Pacific Northwest National Laboratory. *Sept. 2011*
- The Chester F. Luther Mathematics Scholarship from Willamette University. *May 2011*
- Phi Beta Kappa Member, Junior Inductee. *May 2011*

SERVICE

- Referee for Economic Inquiry
- TERF Room (computer lab for UO Economics Department) coordinator

PRESENTATIONS

- “Decomposing Changes in Productivity Using Bayesian Methods.” Western Economic Association International Conference. *July 2016*
- “Markups and Scale Elasticities for Differentiated Railroad Networks.” Western Economic Association International Conference. *July 2015*
- “Simulating Professional Communication with Economic Network Models.” Pacific Northwest National Laboratory. *Aug. 2014*
- “Social Media Analysis.” Pacific Northwest National Laboratory. *July 2012*
- “Air Travel and Infectious Diseases.” Pacific Northwest National Laboratory. *Aug. 2011*
- “Bayesian Networks in Disease Modeling.” Willamette University Mathematics Colloquium. *May 2011*
- “Biosurveillance and FCAT.” Pacific Northwest National Laboratory. *Aug. 2010*

REFERENCES

Wesley W. Wilson (Chair)

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University of Oregon
Department of Finance
(541) 346-5179
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Alfredo Burlando

Assistant Professor
Graduate Placement Director
University of Oregon
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Technological Change and Productivity in the Rail Industry: A Bayesian Approach (Job Market Paper)

Productivity and its growth are central to the long-term growth, and long-term viability of firms and industries. Partial deregulation of railroads was led by concerns that existing regulation and changes to the industry led to stagnation in productivity. Policy changes made it easier for firms to increase productivity through broad organizational changes like mergers and abandoning unprofitable routes as well as specific technological innovation through the 1980s and early 1990s. However, as the industry has become increasingly consolidated and as more lines have been abandoned, firms may need to rely on technological change to increase productivity. I develop and estimate a model that separates changes in productivity due to innovation and those caused by non-innovative factors and use Bayesian estimation. This allows productivity and technology to evolve flexibly across firms and through time, allowing an examination of changes in railroad productivity and identification of its driving component. I find that every Class I railroad has experienced growth in productivity since 1999. Improvements in technology were the driving factor in the growth of BNSF, KCS, Soo Line, and UP, while CN, CSX, and NS saw significant growth due to broad organizational changes. Finally, I develop a metric that determines whether firms substitute inputs towards factors that innovation makes more productive. I estimate the probability that each firm takes that action to be around 50% with no discernible pattern over time, providing evidence that firms don't anticipate technological change or don't adjust input allocation to take advantage of innovations.

Markups and Scale Elasticities for Differentiated Railroad Networks

In this paper, we develop and estimate a model that provides both markups and scale elasticities that vary across railroads and through time for the traffic on their networks. Our model is based on a framework provided by Hall (1988) and Klette (1999) wherein markups and scale elasticities are estimated from production relations. In our model, we aggregate the shipments over each firm's network, which provides a mapping from inputs and network and shipment characteristics to aggregate outputs over the network. Markups and scale elasticities are taken to follow a multivariate distribution. This allows for differences in markups and scale across firms and through time, but also for covariances across firms in markups and scale. We estimate the model with Bayesian methods to find markups that are generally well in excess of marginal costs and scale elasticities that generally point to increasing or constant returns in the industry.

Competitive Pressures and Inefficiency in Allocation

There is a wealth of literature that points to inefficiencies in production. Inefficiencies can arise in the production of outputs from overutilization of inputs in the production process (technical inefficiency) or from errors in optimization that misalign factor prices and optimal input decisions (allocative inefficiency). In examinations of inefficiency, many studies use an inflexible production technology, typically the Cobb-Douglas form, which fails to account for differences in the technology of firms, or fails to control for the effects of competition in limiting inefficiency. In this study, I develop a model that allows for substitutes and complements in production and flexibly accounts for patterns in productivity. I use the model to derive firm cost functions and estimate technical and allocative inefficiencies. Finally, I allow allocative errors to be correlated with the level of competition to examine how the incentive to precisely allocate inputs and minimize costs are affected by competitive pressures.