



Shiming Wu

◇ Email: wu.shiming@hotmail.com ◇ Website: <https://shiming-wu.github.io/>

Education

The University of British Columbia, Vancouver, Canada

PhD in Economics 2020 - 2026 (expected)

Master of Science in Business Administration in Finance 2018 - 2020

Nankai University, Tianjin, China

Bachelor of Economics in Finance 2012 - 2015

Fields

Insurance, Industrial Organization, Environmental Economics, Labor Economics, Machine Learning

References

Paul Schrimpf

paul.schrimpf@ubc.ca

Gorkem Bostanci

gorkem.bostanci@ubc.ca

Katherine Wagner

katherine.wagner@ubc.ca

David Green

david.green@ubc.ca

Research Grants, Awards, and Fellowships

CIDER Small Grants in Innovative Data (C\$26,000) 2023 – 2024

Sir Quo-Wei Lee Fellowship from St. John's College 2024 - 2026

Harnan A.N. Singh Scholarship in Economics 2022

President's Academic Excellence Initiative PhD Award 2020 – 2026

Faculty of Arts Graduate Fellowship 2020 – 2025

International Student Tuition Award 2018 – 2026

Merit Student and Scholarships from Nankai University 2012 - 2015

Job Market Paper

What Constrains Insolvency in Property Insurance?

Market Discipline, Capital Regulation, and Catastrophe Exposure

- This study disentangles the roles of capital requirements and credit ratings in constraining insolvency in the U.S. property insurance market. First, an instrumental variable regression, using a 2017 policy change as a quasi-experiment, is employed to analyze the impact of capital requirements. The results indicate that a \$1 million increase in required capital leads to a \$3.34 million increase in held capital and a 0.218 percentage point rise in insurance prices. This suggests a direct trade-off between financial stability and consumer affordability. Second, a structural model is developed to examine how insurers make capital and pricing decisions in a competitive market with limited liability and the risk of catastrophic events. A counterfactual analysis reveals that in the absence of capital regulation, the insolvency rate would increase by 0.56 percentage points, while insurance prices would fall by 0.27% to 4%. The model predicts that some insurers would engage in riskier behavior, leading to an increase in market concentration. These findings highlight the essential function of capital regulation in preventing market instability, even in the presence of credit ratings. Further analysis indicates that the current capital regulation threshold may be suboptimal for welfare.

- In this paper, I apply several data science methods to structural estimation.
 - MLE to estimate return distribution and losses distributions
 - BLP type supply estimation to estimate random shocks of insolvency
 - Random forest to impute missing credit rating
 - Generalized additive model (GAM) to estimate capital and credit rating functions
 - Model fitting (minimum distance) to estimate reinsurance payment function
 - I built a Linux workstation to run estimation

Working Papers

Transformation of College to University and Impacts on Labor Market Outcomes

- This paper studies the impacts of different types of post-secondary education on education and labor market outcomes. I first use variations of distances to institutions and exogenous variations of colleges that upgraded into universities to investigate the value added to university education. Then I separately estimate the impacts of the transformed universities and traditional colleges and universities. I compared results from OLS and IV regressions. To address the treatment heterogeneity, I adapt the locally linear specification from Mountjoy (2022). Results suggest that the difference between university and college graduates is marginal. However, university entry improves labor market outcomes, such as employment and earnings compared with cohorts without post-secondary education. Graduates from transformed universities obtain a higher probability of being employed and higher earnings compared with people without post-secondary education. Nonetheless, transformed university graduates may have worse performance in the labor market, compared with graduates from colleges or traditional universities. Furthermore, graduates from transformed universities are more willing to register for training when they are unemployed compared with the other three groups.

The Impacts of Health Insurance Mandates on the Labour Market and Health, Evidence from ACA

- This paper studies how employer mandates and health insurance affect labor market outcomes and health. I use staggered difference-in-differences research design and variations in the Affordable Care Act to learn how employer mandate affects labor market outcomes. I use doubly robust difference-in-differences in my main specifications to reduce selection bias. Results in the full sample suggest that the employer mandates in the Affordable Care Act increased hourly wages and did not have significant impacts on employment and part-time employment. Employer mandates stimulate a larger increase in employer-sponsored health insurance coverage rates among low-income workers. However, low-income workers are more vulnerable to involuntary part-time employment if employers reduce work hours to circumvent employer mandates. Firms prefer to reduce work hours to circumvent employer mandates instead of firing workers. Using doubly robust estimators and staggered difference-in-differences research design, I find evidence that providing health insurance improves workers' health. The employer mandate may increase productivity by improving workers' health status. Still, it may widen income inequality in the long run because low-income workers are more vulnerable to work hours losses.

Work in Progress

Mitigating the Trade-off: How Natural Catastrophe Adaptation Can Reconcile Insurer Solvency and Affordability

- Stringent capital regulation in property insurance markets creates a tension between insurer solvency and affordability. This paper demonstrates that adaptation to natural catastrophes can mitigate this trade-off.

I develop and estimate a model of the property insurance market with interdependent loss structures, competition, and capital regulation. My counterfactual analysis shows that adaptation measures, by reducing the correlation of losses, would decrease the market insolvency rate and lower market concentration. Furthermore, I find a net positive impact on social welfare when the costs of insurer insolvency are repurposed to subsidize adaptation. My results indicate that policy should focus on incentivizing adaptation as a key tool for maintaining sustainable insurance markets.

A Reinforcement Learning Approach to Dynamic Capital Regulation in Property Insurance

- This paper examines the policy debate on transitioning from static, formula-based capital regulation in the U.S. property insurance market to a dynamic, model-based approach. I propose a novel theoretical framework where regulators set a target insolvency probability, compelling insurers to adjust their capital holdings to remain below this threshold. A key feature of my model is the incorporation of an adaptive two-level learning process for insurers, acknowledging the evolving nature of risk due to climate change and increasing catastrophic events. I introduce an algorithm that enables regulators to facilitate this learning process while maintaining a stable and low industry-wide insolvency rate. This research contributes to the literature on financial regulation by demonstrating how a model-based approach can foster a more resilient and adaptive insurance sector in the face of growing uncertainty.

From Monoculture to Market: The Economics of Plant Biodiversity and Consumer Welfare

- This paper investigates the complex relationship between industrial agriculture, plant biodiversity, and economic welfare. While industrial agriculture has been credited with increasing food production, it has also been linked to a significant decline in agrobiodiversity. This research disentangles two opposing economic forces: the homogenizing effect of industrial agriculture's focus on a few high-yield, storable crops, and the potential for market competition to foster product variety. I develop and estimate a structural model of demand and supply for fresh produce, employing a random coefficients logit model (BLP) to capture heterogeneous consumer preferences for a wide range of crop attributes, including variety. On the supply side, I model farmers' and food companies' decisions to offer different cultivars, considering the influence of production costs, market structure, and agricultural policies. Using detailed market-level data, I quantify the welfare effects of changes in plant biodiversity on consumers and producers. Furthermore, I extend the traditional welfare analysis to incorporate the non-market value of agrobiodiversity as a source of resilience to climate shocks. My findings aim to provide a more complete picture of the true social costs and benefits of industrial agriculture and to inform policies that promote a more diverse and sustainable food system.

Teaching

ECON 502 Macroeconomics, teaching TA (UBC)

ECON 490 Seminar in Applied Economics, TA (UBC)

ECON 370 Benefit-Cost Analysis and the Economics of Project Evaluation, TA (UBC)

ECON 356 Introduction to International Finance, TA (UBC)

ECON 255 Understanding Globalization, teaching TA (UBC)

ECON 102 Principles of Macroeconomics, teaching TA (UBC)

ECON 101 Principles of Microeconomics, teaching TA (UBC)

Conferences

2024: 19th CIREQ PhD Students' Conference

2022: NBER Insurance Working Group Meeting

Employment

Teaching assistant at University of British Columbia	2021 - present, Vancouver, Canada
Research assistant at University of British Columbia	2019 - 2024, Vancouver, Canada
Tutor and teaching assistant at Yingde Inspiration Education	2017 - 2018, Yingde, China
Auditor at KPMG	2015 - 2016, Beijing, China

Other Information

Computer Skills	R, Julia, Stata, Matlab, SPSS, Python, L ^A T _E X
Data Science	Machine learning, Causal inference, Structural estimation
Languages	English (fluent), Mandarin (native), Cantonese (native), French (learning)