

# SUNJAE WON

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## EDUCATION

### **Ph.D., Economics**

*Aug 2022*

North Carolina State University, Raleigh, NC

Dissertation: Three Essays on the Agriculture Production and Yield Risk Modeling

Advisor: Barry K. Goodwin(co-chair), Sujit K. Ghosh, Roderick M. Rejesus, Kathryn A. Boys

### **M.A., Economics**

*May 2013*

Boston University, Boston, MA

Department of Economics

### **B.A., Economics and Finance, *cum laude***

*Aug 2011*

Hanyang University, Seoul, South Korea

Department of Economics and Finance

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## PROFESSIONAL APPOINTMENT

### **Assistant Professor of Production Econometrics, Auburn University**

*Aug 2022-present*

Department of Agricultural Economics and Rural Sociology

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## RESEARCH AREA

Agricultural Economics, Applied Spatial Econometrics, Environmental Economics, Food Economics

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## WORKING PAPERS

"**Understanding the Effect of Cover Crop Use on Prevented Planting Losses**", with Roderick Rejesus, Barry Goodwin, and Serkan Aglasan [Job Market Paper]

The effects of cover cropping on various agricultural production outcomes have been a topic of recent interest given its potential to improve resilience against climate-change-induced extreme weather events. Using a novel data set that combines satellite-based cover crop information and county-level crop insurance data, we examine the impact of planting cover crops on prevented-planting-related losses that are typically caused by heavy rainfall events. Results of our analysis suggest that counties with higher cover crop adoption rates tend to have lower levels of crop insurance losses due to prevented planting. This supports the notion that cover crops improves soil conditions enough such that the likelihood of farmers being prevented from planting in the spring is reduced. We posit that the ability of cover crops to deal with excess moisture (i.e., through better water absorption and improved water infiltration in the soil) is the main factor in its ability to reduce prevented planting losses in US agriculture.

"**Empirical Modeling of the Risk and Determinants of Food-Related Illnesses: Foodborne Outbreaks, 2010-2018**", with Barry Goodwin and Kathryn Boys

Each year one in six Americans experience foodborne illnesses which result in a significant financial burden, up to \$51 billion. Also, these food-relevant disease outbreaks present significant risks to the private sector businesses involved in the provision of food and food-related products. We utilize state-level data taken from the Centers for Disease Control and Prevention to investigate the impact of host factors associated with the agricultural work environment on foodborne-relevant risks. To measure the

agricultural work environment, the U.S. Bureau of Economic Analysis farm income and expense data are employed. We find evidence that the poor agricultural work environment can increase risks associated with foodborne outbreaks: intensive livestock farming might weaken the immune system of farmers and residents who can be more likely to get severely ill from foodborne illnesses. Compared to the agriculture producer sector, the processor sector maintains relatively higher standards for hygiene which might lead to the strong immune system of residents who are less susceptible to foodborne illness.

## WORK IN PROGRESS

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**"Understanding the Yield Impacts of Alternative Cover Crop Families and Mixtures: Evidence from Side-by-Side Plot-level Panel Data"**, with Roderick Rejesus, Serkan Aglasan, and Aurelie Poncet

The short-run effects of cover crop use on cash crop yields (e.g., corn, soybeans) have been a topic of debate given that evidence from previous literature has generally been mixed on this issue. Past studies often suggest that the observed yield effect varies (i.e., negative, positive, or insignificant), depending on the applied cover crop species used, the management strategy applied, weather, and soil conditions (among others). In this study, we examine the short-run yield impact of four different cover crop families — grasses (*Poaceae*), broadleaves (*Brassica*), legumes (*Fabaceae*), and others — both as single-family groups and as mixtures. Data from side-by-side experimental plots in six Eastern US States were collected from 2017 to 2019 in order to achieve the objective of the study. Statistical analysis of this multi-year plot-level data suggests that the majority of the cover crop families and mixtures investigated in this study do not have a statistically significant short-run effect on subsequent cash crop corn yields. One cover crop treatment even resulted in short-run yield losses (i.e., a yield penalty). These results imply that cash crop yield benefits from cover crop adoption are likely not going to be observed with just one year of use. This lack of immediate economic benefit may explain the relatively low cover crop adoption rate currently observed in the US, and the need for cost-share subsidy payments to encourage uptake of this practice.

**"Spatial Models for Estimating Systemic Yield Risk: Corn Yield in the Corn Belt, 1951-2019"**, with Barry Goodwin and Sujit Ghosh

## RESEARCH EXPERIENCE

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### North Carolina State University

*Aug 2020-Aug 2022*

Research Assistant, Department of Agriculture and Resource Economics

*Raleigh, NC*

- USDA Agriculture and Food Research Initiative Program (ARFI), (10hrs/wk)
- Principal Investigator: Dr. Barry K. Goodwin
- Investigated the potential for post-harvest risks coverage in the crop insurance
- Identified determinants of foodborne illness outbreaks
- Presented results at 2021 AAEA & WAEA Joint Annual Meeting

### North Carolina State University

*May 2021 - Aug 2021*

Research Assistant, Department of Agriculture and Resource Economics

*Raleigh, NC*

- NCSU/Hub Partnership Project, (20hrs/wk)
- Principal Investigator: Dr. Roderick M. Rejesus
- Investigated economic benefits of soil health management systems in the Northeast US
- Designed econometric models to study the impact of soil health practices

- Presented results at multiple seminars and expected to submit the paper to the American Journal of Agricultural Economics

### **Korea Development Institute**

Research Associate, Department of Macroeconomic Policy

*Jan 2016 - Aug 2017*

*Sejong, South Korea*

- Korean government agency to conduct policy-oriented research, (Full time)
- Principal Investigator: Dr. Sora Chon
- Estimated inflation and its decomposed main descriptive factors by Vector Error Correction Model
- Published results in the Journal of Korean Development Institute

### **Graduate School of Korea Development Institute**

Research Assistant, Department of Macroeconomic Policy

*May 2014 - Dec 2015*

*Seoul, South Korea*

- Government-run graduate school to study macroeconomic policy, (Full time)
- Principal Investigator: Prof. Kyung-wook Hur
- Reviewed papers for Regional Financial Arrangement (RFA), Multilateral development banks, and related regulations by Bank for International Settlements around (Basel III)
- Analyzed Global Financial Safety Net data (i.e., Swap lines, International Monetary Fund, RFA)
- Investigated the impact of financial economic policies relevant to Trans-Pacific Partnership
- Published findings as a G20 internal report

## **INVITED PRESENTATIONS**

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2022 AAEA Annual Meeting	<i>2022</i>
Understanding the Effect of Cover Crop Use on Prevented Planting Losses	<i>Anaheim, CA</i>
Exploring Linkages between Agri-food Sector Production and Foodborne Illness Outbreaks	
SCC-76/NC-1177 2022 Annual Meeting	<i>2022</i>
Understanding the Effect of Cover Crop Use on Prevented Planting Losses	<i>Kansas City, MO</i>
International Conference on Food Economics and Agricultural Sustainability	<i>2021</i>
Understanding the Effect of Cover Crop Use on Prevented Planting Losses	<i>Virtual</i>
AAEA GSS Webinar	<i>2021</i>
Understanding the Effect of Cover Crop Use on Prevented Planting Losses [Slides]	<i>Virtual</i>
NC State University EATD Seminar	<i>2021</i>
Understanding the Effect of Cover Crop Use on Prevented Planting Losses	<i>Raleigh, NC</i>
Virginia Tech AAEC Seminar	<i>2021</i>
Understanding the Effect of Cover Crop Use on Prevented Planting Losses	<i>Blacksburg, VA</i>
2021 AAEA & WAEA Joint Annual Meeting	<i>2021</i>
Empirical Modeling of the Risk and Determinants Associated with Food-Related Illnesses: Foodborne Outbreaks, 2010-2018 [Slides]	<i>Austin, TX</i>
Northeastern Agricultural and Resource Economics Association Annual Meeting	<i>2020</i>
Understanding the Yield Impacts of Alternative Cover Crop Types: Evidence from Plot-level Panel Data [Slides]	<i>Virtual</i>
2020 AAEA Annual Meeting	<i>2020</i>
Understanding the Yield Impacts of Alternative Cover Crop Types: Evidence from Plot-level Panel Data [Poster]	<i>Atlanta, GA</i>



## TEACHING EXPERIENCE

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### **Auburn University**

Independent Instructor

*Raleigh, NC*

- Introduction to Agricultural Econometrics (AGEC7590) *Fall 2022-Present*

### **North Carolina State University**

Independent Instructor

*Raleigh, NC*

- Introduction to Resource and Environmental Economics (ARE336) [Syllabus] *Fall 2019-Spring 2022*

### **North Carolina State University**

Graduate Teaching Assistant

*Raleigh, NC*

- Introduction to Agricultural and Resource Economics (ARE201A) *Spring 2021*
- Agribusiness Finance (ARE121) *Spring 2021*
- Management of Personnel (ARE 132) *Spring 2021*
- Special Topics in Agricultural and Resource Economics (ARE495) *Fall 2020*
- Farm Business Management (ARE303) *Fall 2020*
- Introduction to Resource and Environmental Economics (ARE336) *Fall 2019*
- Microeconomics (EC201) *Fall 2019*
- Microeconomics (EC201) two sessions, Lab instructor *Spring 2019*
- Microeconomics (EC201) two sessions *Fall 2018*
- Industrial Organization (EC413) *Spring 2018*

### **Hanyang University**

Undergraduate Teaching Assistant

*Seoul, South Korea*

- Financial Economics (ECO2059, Lecture in English) *Fall 2009*

## OTHER PUBLICATIONS

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**Korea Development Institute. (2016). Impact from Changing Internal and External Conditions on Korea's Consumer Prices. *KDI, Feature Article. 2016 2nd. Seoul, South Korea***

- Principal Investigator: Dr. Sora Chon
- Organized inflation-relevant databases and accomplished decomposition of the inflation by Generalized Method of Moments (GMM)
- Forecast inflation based on estimation of decomposed factors by Vector Error Correction Model (VECM)
- Programs utilized: R, Stata

**Korea Development Institute. (2016 January/2017 August). Monthly Economic Trends and Economic Outlook *KDI. Seoul, South Korea (Periodical, Monthly)***

- Maintained and updated inflation-relevant databases including the consumer price index (including agricultural price) and producer price index
- Modeled to predict short-term price indexes for policy recommendations and guidance
- Wrote and presented a monthly report based on in-depth analyses of inflation-relevant conditions

- Programs utilized: Stata

## SCHOLARSHIP

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NCSU Graduate Fellowship	<i>2018 - Present</i>
NCSU Poole College of Management Scholarship	<i>2018 - 2020</i>
Global Human Resource Scholarship, Hanyang University	<i>2005</i>

## MILITARY EXPERIENCE

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<b>Staff Sergeant at Republic of Korea Air Force, Suwon, South Korea</b>	<i>Dec 2006 - Feb 2009</i>
<i>Division of Budget at Suwon Air Base</i>	

## TECHNICAL STRENGTH

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R(Advanced), Stata(Advanced), Matlab(Intermediate), SAS(Intermediate), Python(Beginning), ArcGIS(Beginning), L<sup>A</sup>T<sub>E</sub>X(Advanced)

## NATIONALITY AND LANGUAGES

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Nationality: Republic of Korea; Language: English(fluent), Korean(native)

## REFERENCE

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**Barry K. Goodwin** (Co-Chair): bkgoodwi@ncsu.edu, 919.515.4620  
**Sujit K. Ghosh** (Co-Chair): sghosh2@ncsu.edu, 919.515.2570  
**Roderick M. Rejesus**: rmrejesu@ncsu.edu, 919.513.4605  
**Kathryn A. Boys**: kaboy@ncsu.edu, 919.515.2490

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