Research/Extension Program Overview

Wendong Zhang

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October 7, 2022

Dyson
Cornell
SC Johnson College of Business

Research & Extension Program Themes

- **Theme I: Agriculture & the Environment**
- **Theme II: Land Value, Land Ownership, Land Tenure, Land Use**
- **Theme III: Chinese Agriculture & its Global Trade Implications**
- Other Useful information:

  Appointment: 50% Research & 50% Extension

  Faculty Affiliate, Cornell Institute for China Economic Research (CICER)

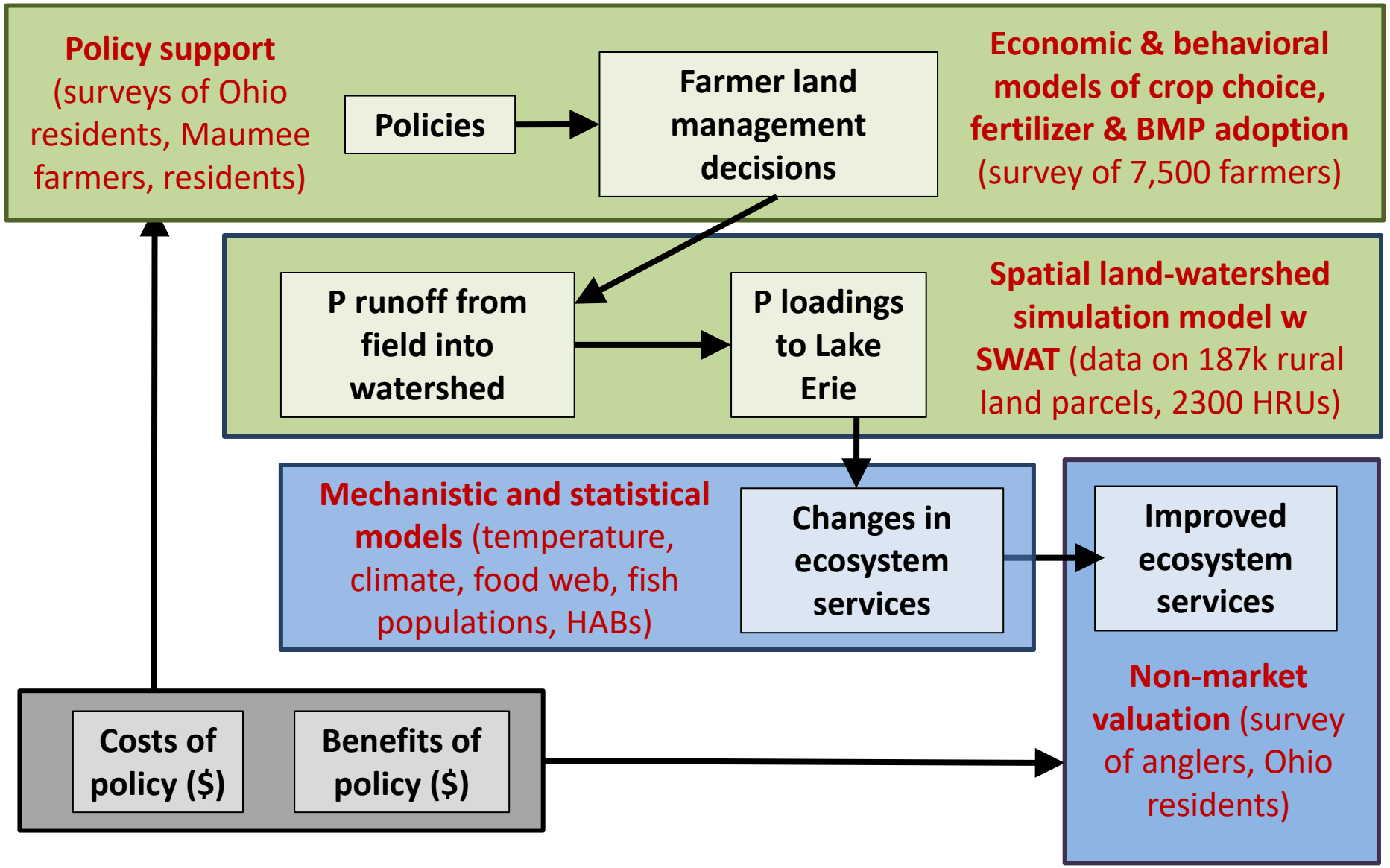
  Faculty Fellow, Cornell Atkinson Center for a Sustainable Future

  Highlights at Iowa State: Led Iowa land value survey; co-founded the ISU China Ag Center

  Associate Editor for AJAE & Journal of Soil and Water Conservation

  Courses taught: Environmental economics (PhD); Rural property appraisal, Chinese economy, Ag & trade policy (Undergraduate)

Theme I: Agriculture & the Environment



Farmer Decision Making

Land Economics

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Institution: IOWA STATE UNIV

This item requires a subscription to Land Economics.

Full Text (PDF)

Hongxing Liu, Wendong Zhang, Elena Irwin, Jeffrey Kast, Noel Aloysius, Jay Martin, and Margaret Kalcic

Best Management Practices and Nutrient Reduction: An Integrated Economic-Hydrologic Model of the Western Lake Erie Basin

Land Economics November 2020 96:510-530;

ELSEVIER

Journal of Great Lakes Research

Volume 42, Issue 6, December 2016, Pages 1343-1356

What motivates farmers to apply phosphorus at the "right" time? Survey evidence from the Western Lake Erie Basin

Wendong Zhang [a] ✉, Robyn S. Wilson [b], Elizabeth Burnett [b], Elena G. Irwin [c], Jay F. Martin [d]

ELSEVIER

Land Use Policy

Volume 79, December 2018, Pages 609-621

Do farmers adopt fewer conservation practices on rented land? Evidence from straw retention in China

Li Gao [a] ✉, Wendong Zhang [b] ✉, Yingdan Mei [a] ✉, Abdoul G. Sam [c] ✉, Yu Song [d] ✉, Shuqin Jin [e] ✉

Non-market valuation: valuing ecosystem services

American Journal of Agricultural Economics

AAEA

Article | Full Access

Do U.S. Anglers Care about Harmful Algal Blooms? A Discrete Choice Experiment of Lake Erie Recreational Anglers

Wendong Zhang ✉, Brent Sohngen

First published: 23 March 2018 | https://doi.org/10.1093/ajae/aay006 | Citations: 23

Abstract

Despite the growing awareness of harmful algal blooms (HABs) in the United States and abroad, estimates of welfare losses due to their presence are missing from the literature. Using a mail survey of 767 Ohio Lake Erie recreational angler respondents and a choice experiment, this study provides the first empirical quantification of the economic impacts of HABs on U.S. recreational anglers. Our results demonstrate a significant and substantial willingness to pay by anglers for reduction in HABs, beyond the benefits associated with conventional water quality measures such as catch rates and water clarity. For instance, we find that anglers are willing to pay $8 to $10 more per trip for one less mile of boating through HABs en route to a fishing site. This finding suggests that explicit measures of HABs need to be collected and considered when valuing water quality in nutrient-rich bodies of water. We evaluate the welfare improvements resulting from several nutrient reduction policies, and find that anglers are willing to pay on average $40 to $60 per trip for a policy that cuts upstream phosphorus loadings by 40%. The majority of welfare gains for anglers result from improving the non-catchable component of the fishing experience, notably water clarity and HAB reduction, as opposed to better chances of angler success.

New projects incorporates experimental design in farmer surveys

IOWA STATE UNIVERSITY
College of Agriculture and Life Sciences
Iowa Nutrient Research Center

Search

Main Menu

Home » Projects » 2017

Improving the Effectiveness of Conservation Programs through Innovative Reverse Auctions and Sensible Enrollment Restrictions

Date: Sep 2017

Investigators: Wendong Zhang, Gregory Howard

Cleaner Water Begins with You!

Edge-of-field Conservation Practices Benefit Water Quality and Wildlife

Cleaner Water Begins with You!

Edge-of-field Conservation Practices Improve Water Quality

52%

Water quality enhancement wetlands decrease nitrogen going into surface water by an average of 52 percent, depending on the size of the wetland.

Numerous species of birds, insects, mammals, reptiles, and amphibians—including **species of greatest conservation need**—rely on wetlands as valuable habitat.

Edge-of-field practices could work for you and for the watershed!

No one practice is ideal for all sites, so talk to your local conservation or Extension team—they can point you to science-based tools that will help with your decision. You'll be helping to strengthen the overall health of your watershed and improving water quality in Iowa and beyond.

52%

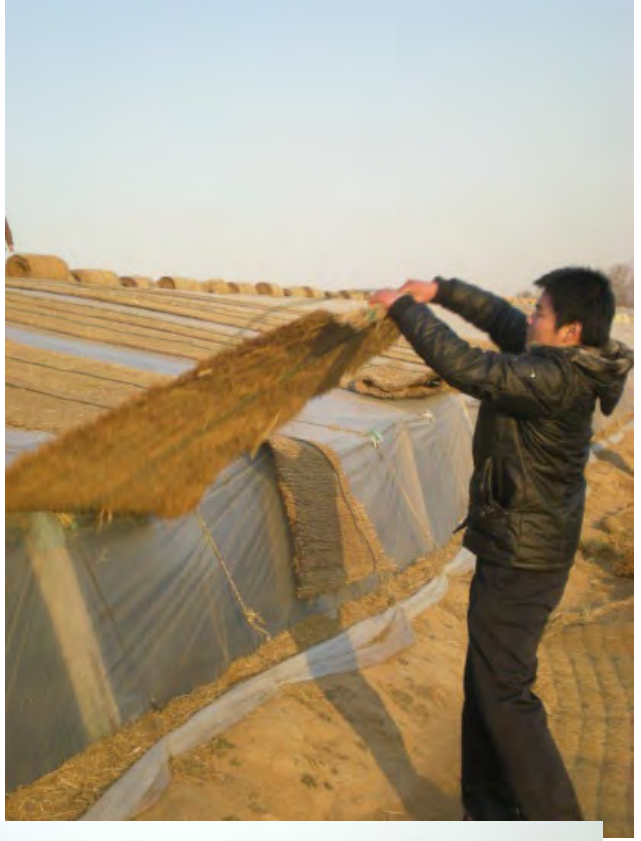
Water quality enhancement wetlands decrease nitrogen going into surface water by an average of 52 percent, depending on the size of the wetland.

Restored oxbows decrease nitrogen entering surface water by an average of 56 percent.

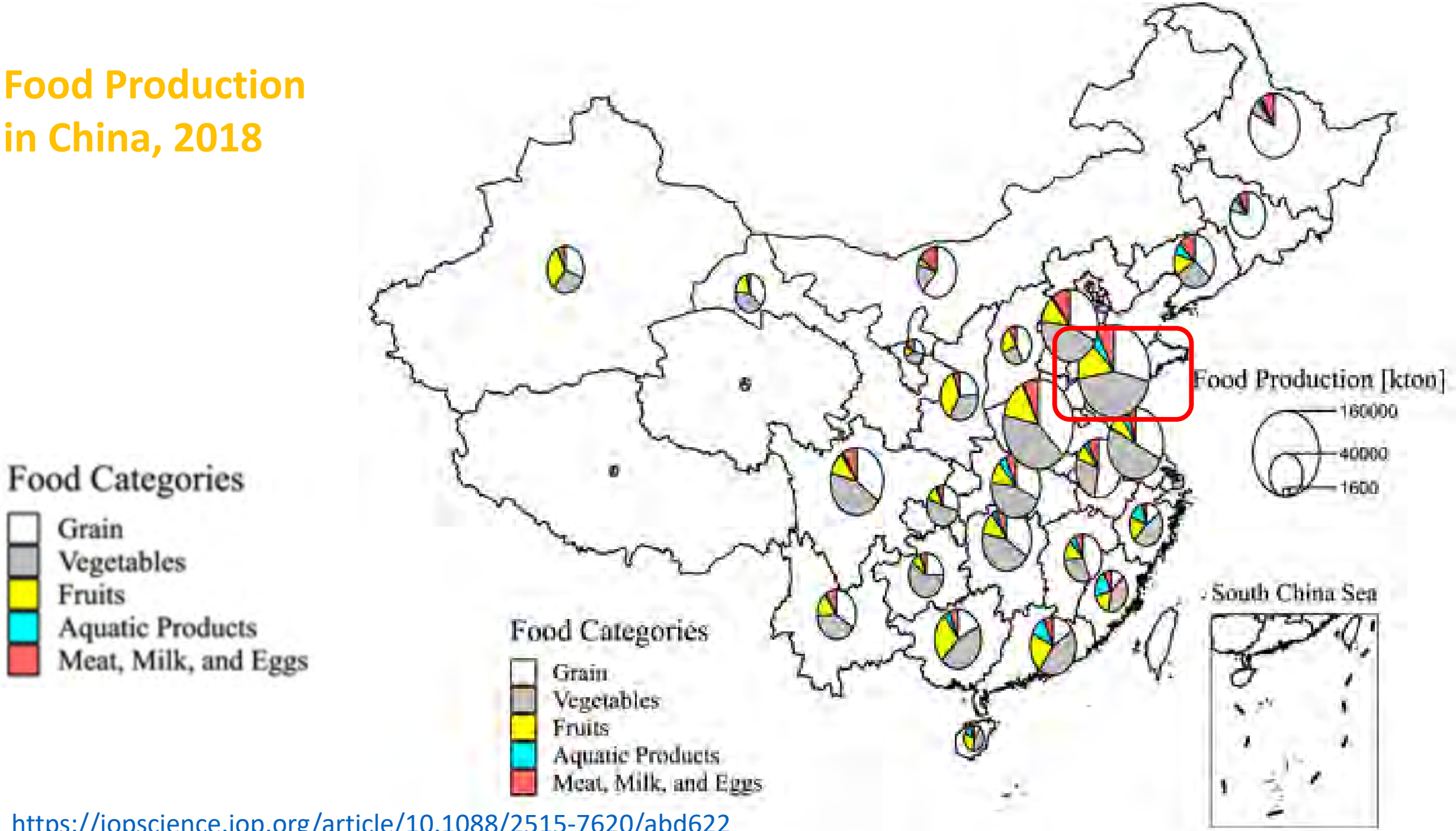
Wetlands, especially oxbows, also provide additional water storage on the landscape.

Agricultural transformation in my hometown

Greenhouse – plastic film - Shandong Province



Food Production in China, 2018



https://iopscience.iop.org/article/10.1088/2515-7620/abd622

Extension Work on Conservation

Voices of Iowa Women Landowners on Conservation

PUBLISHED
6/15/2022

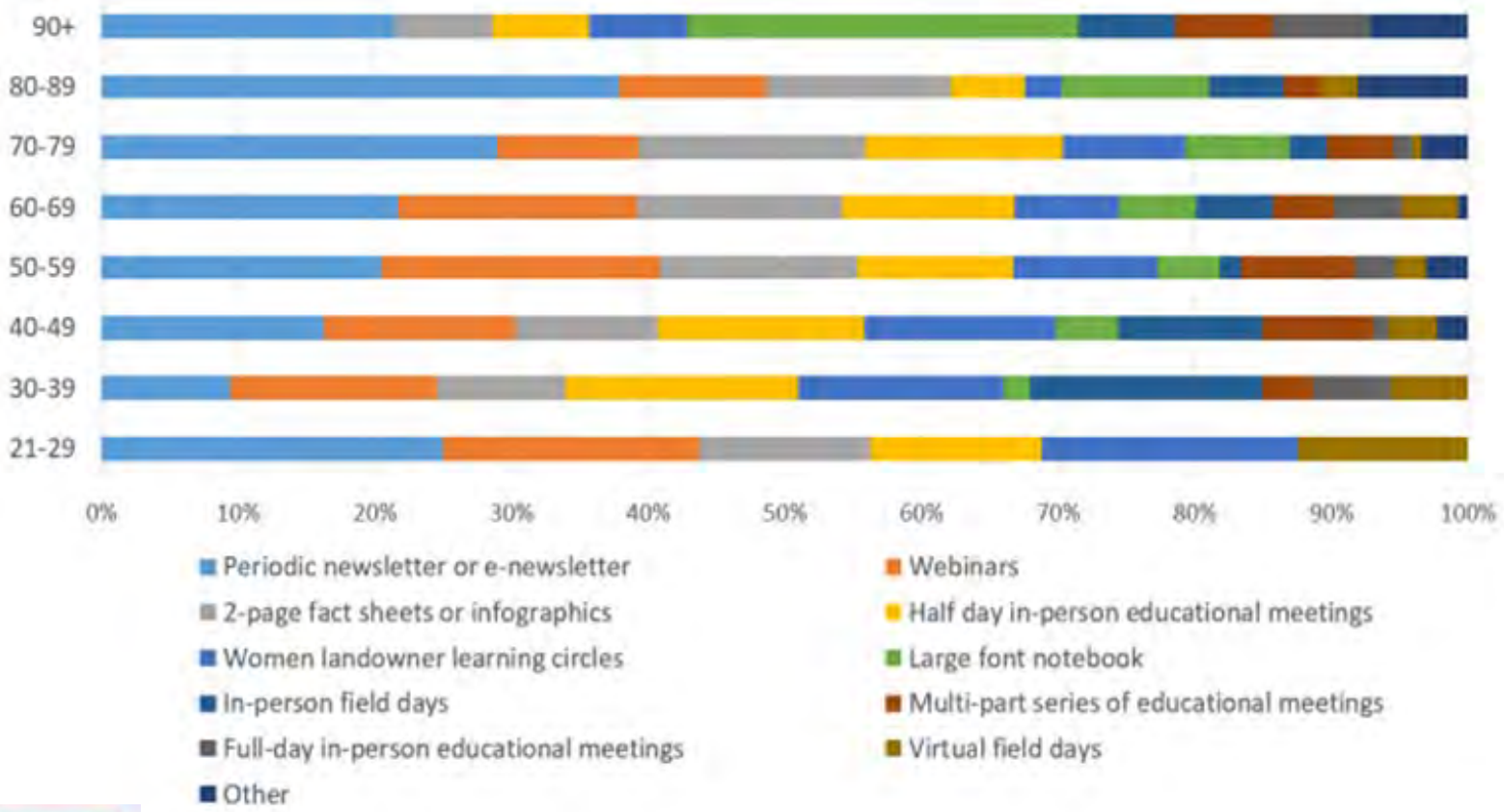


Figure 2. Women landowners' preferred methods to receive information and educational programming by age group.

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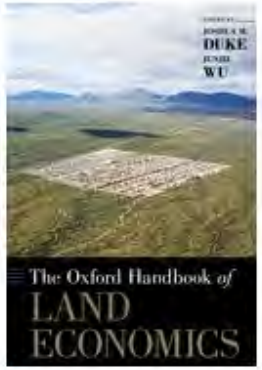
Theme II: Land Values, Ownership & Use



The Oxford Handbook of Land Economics

Joshua M. Duke (ed.), JunJie Wu (ed.)

Contents

- ▸ Front Matter
- Introduction: Land as an Integrating Theme in Economics
- ▾ **Part I Determinants and Drivers of Land Use Change**
  - 1 Integrating Regional Economic Development Analysis and Land Use Economics
  - 2 Technology Adoption and Land Use
  - 3 Are Large Metropolitan Areas Still Viable?

CHAPTER

5 Modeling the Determinants of Farmland Values in the United States

Cynthia J. Nickerson, Wendong Zhang

https://doi.org/10.1093/oxfordhb/9780199763740.013.005 Pages 111–138

Published: 02 September 2014

PDF | Split View | Cite | Permissions | Share ▾

Abstract

Farmland has long represented a significant component of both farm sector and farm household assets. This chapter provides a comprehensive overview of significant developments in modeling farmland values, with attention to methodological challenges and recent modeling innovations. After outlining the capitalization model that provides the theoretical underpinnings for most farmland value studies, the merits and efficacy of dynamic models using aggregate data, as well as increasingly popular cross-sectional hedonic models that use spatially disaggregate data are presented. Estimation issues in hedonic models are reviewed, with a focus on those deserving special consideration in the context of farmland values such as spatial dependence and heterogeneity and sample selection bias. Promising future research directions include greater use of nonparametric approaches, quasi-experimental designs, panel data analyses, and structural econometric models, which take advantage of spatially explicit farmland values data but avoid the restrictive assumptions of standard spatial lag and spatial error models.

Land Economics

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Housing Market Bust and Farmland Values: Identifying the Changing Influence of Proximity to Urban Centers

Wendong Zhang, and Cynthia J. Nickerson

Abstract

This article estimates the impact of the 2007–2008 residential housing market bust on farmland values, using parcel-level farmland sales data from 2001–2010 for a 50-county region under urbanization pressure in western Ohio. Hedonic model estimates reveal that farmland was not immune to the residential housing bust; the portion of farmland value attributable to proximity to urban areas was almost cut in half shortly after the bust in 2009–2010. Nonetheless, total farmland prices remained relatively stable in the 2000s, likely due to increased demand for agricultural commodities. Our results are robust to different assumptions about the structure of the unobserved spatial correlation. *(JEL Q15, R14)*

USDA Economic Research Service

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CHAMPS

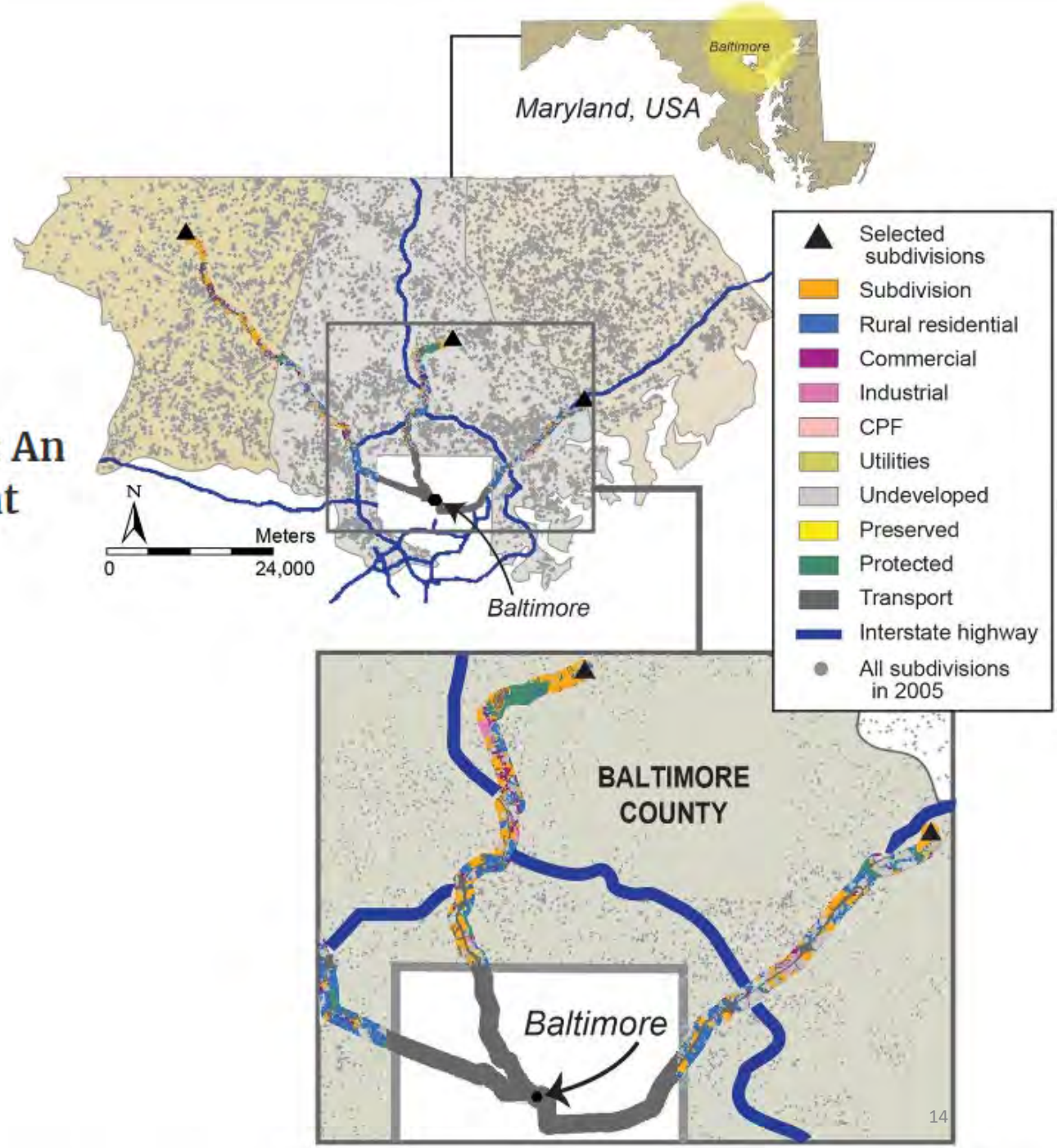
JOURNAL ARTICLE

Spatial Heterogeneity, Accessibility, and Zoning: An Empirical Investigation of Leapfrog Development

Wendong Zhang ✉, Douglas H. Wrenn, Elena G. Irwin

Journal of Economic Geography, Volume 17, Issue 3, May 2017, Pages 547–570,
https://doi.org/10.1093/jeg/lbw007

Published: 04 April 2016 **Article history** ▾



Fudan University – BSc. Environmental Science
University of Hong Kong – Exchange Student, Envi. Eng. [Took my first ArcGIS class]

Synergistic research leveraging extension activities

Land Economics

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Institution: CORNELL UNIVERSITY

Are Expert Opinions Accurate? Panel Data Evidence from the Iowa Land Value Survey

Wendong Zhang, Associate Professor

Sergio H. Lence, Professor and Marlin Cole Chair of International Agricultural Economics

Todd Kuethe, Associate Professor and Schrader Chair in Farmland Economics

Author Affiliations

Abstract

Opinion surveys are the dominant method for gauging U.S. farmland values. However, there is no systematic evaluation of how opinions are formulated and change over time. Using panel data of agricultural professionals from the Iowa Land Value Survey over 2005–2015, we investigate how surveyed experts update their farmland value estimates. We find that experts almost fully correct their prior "errors" in a single period. Experts' opinions also incorporate most of the prevailing price innovations in one period. Our Bayesian estimation technique simultaneously addresses the unobservability and nonstationarity of prevailing farmland values and the Nickell bias in short dynamic panels.

Information Rigidities and Farmland Value Expectations

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Information Rigidity and the Expectations Formation Process: A Simple Framework and New Facts

Olivier Coibion

Yuriy Gorodnichenko

AMERICAN ECONOMIC REVIEW
VOL. 105, NO. 8, AUGUST 2015
(pp. 2644-78)

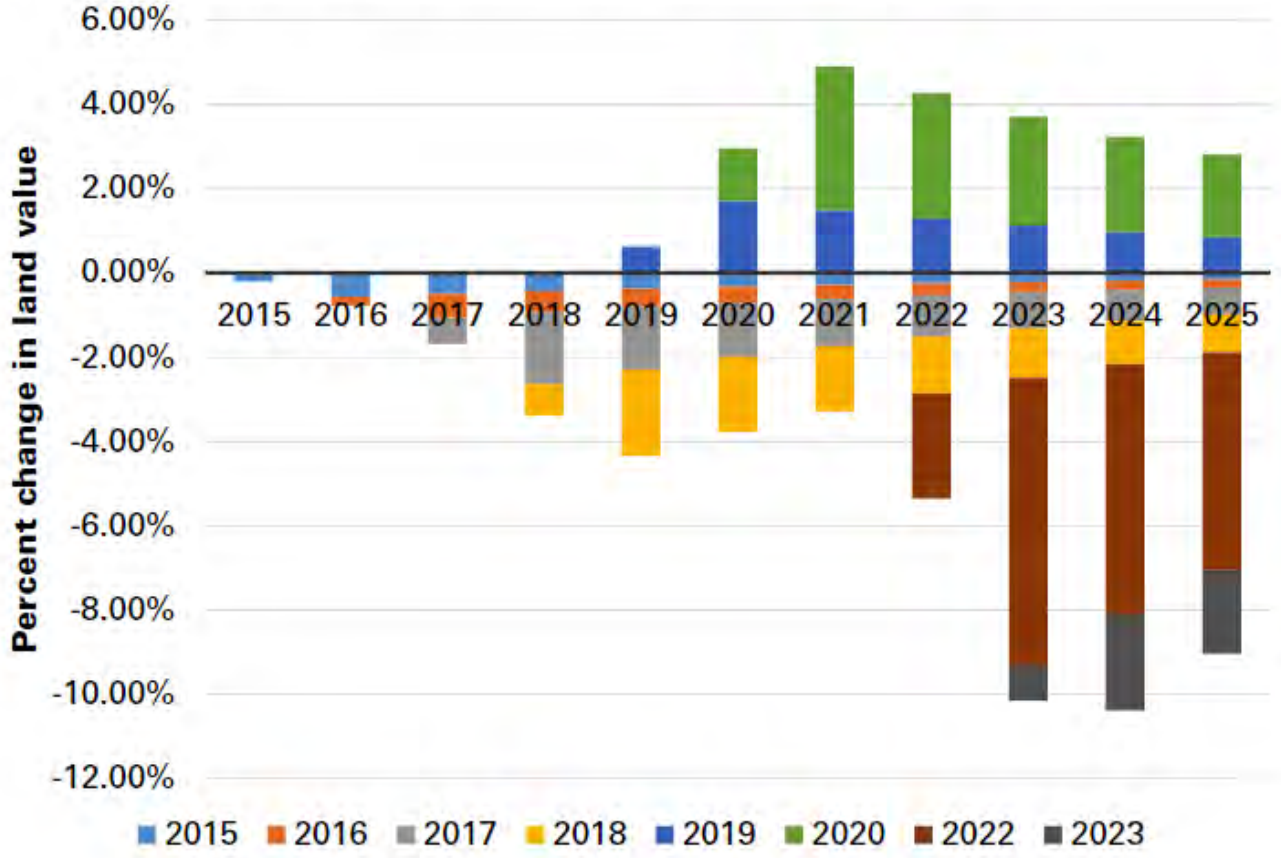
Synergistic research & extension publications

The impacts of interest rate changes on US Midwest farmland values

Albulena Basha, Wendong Zhang, Chad Hart

Agricultural Finance Review
ISSN: 0002-1466
Article publication date: 8 February 2021 Reprints & Permissions
Issue publication date: 29 September 2021

Figure 1. The short- and long-term impacts of recent Federal Reserve interest rate moves on I-states' farmland values



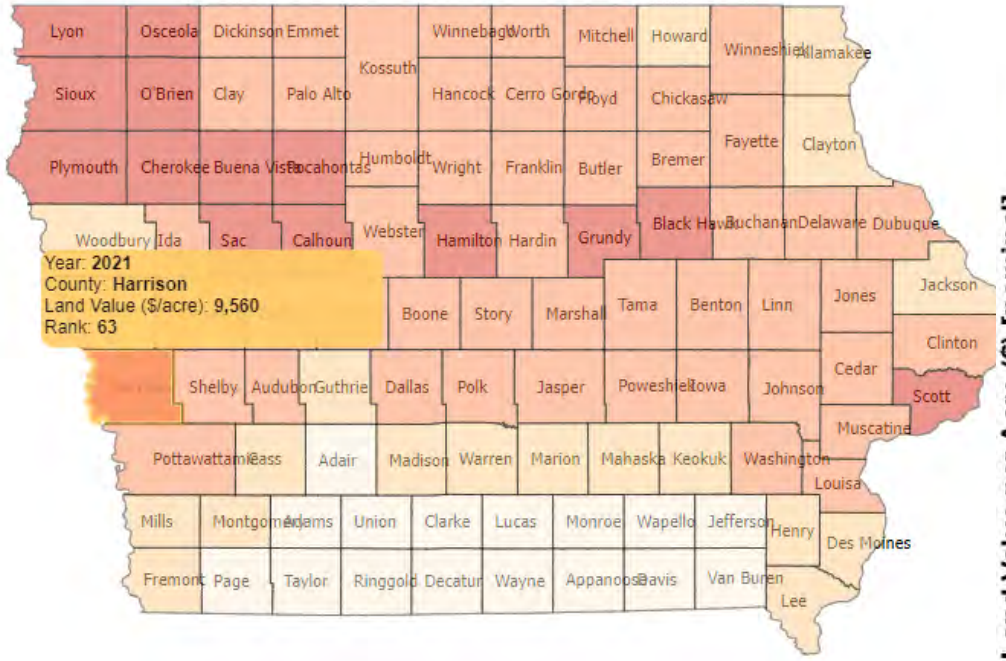
Note: the legend shows the policy years during which the Federal Reserve made changes in the benchmark federal funds rates. The 2022 and 2023 projections assume twelve and four hikes based on the Federal Reserve Dot Plot, or 3-percentage-point and 1-percentage-point increase.

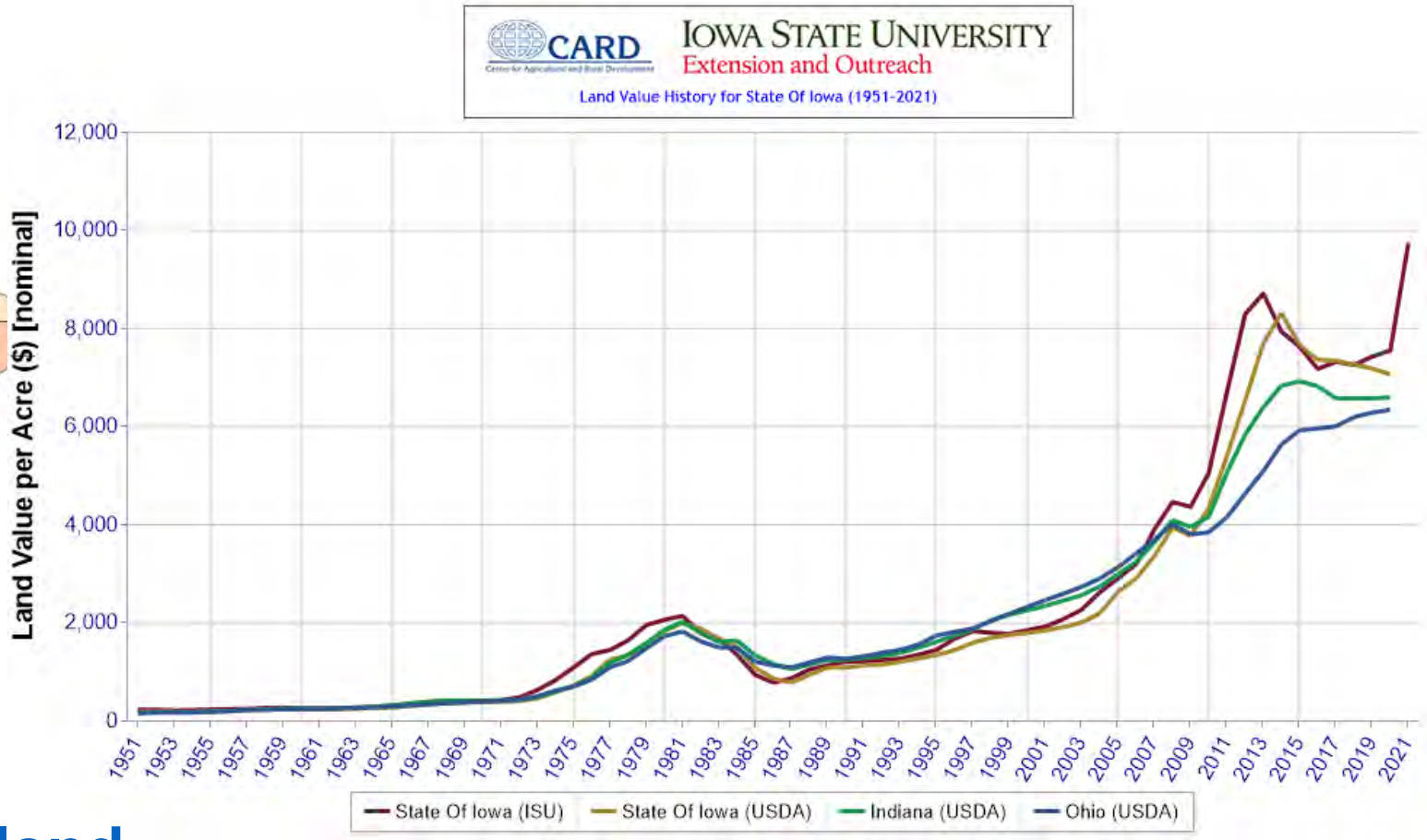
Will the soaring farmland market continue to rise?

Ag Decision Maker
extension.iastate.edu/agdm

Special Report

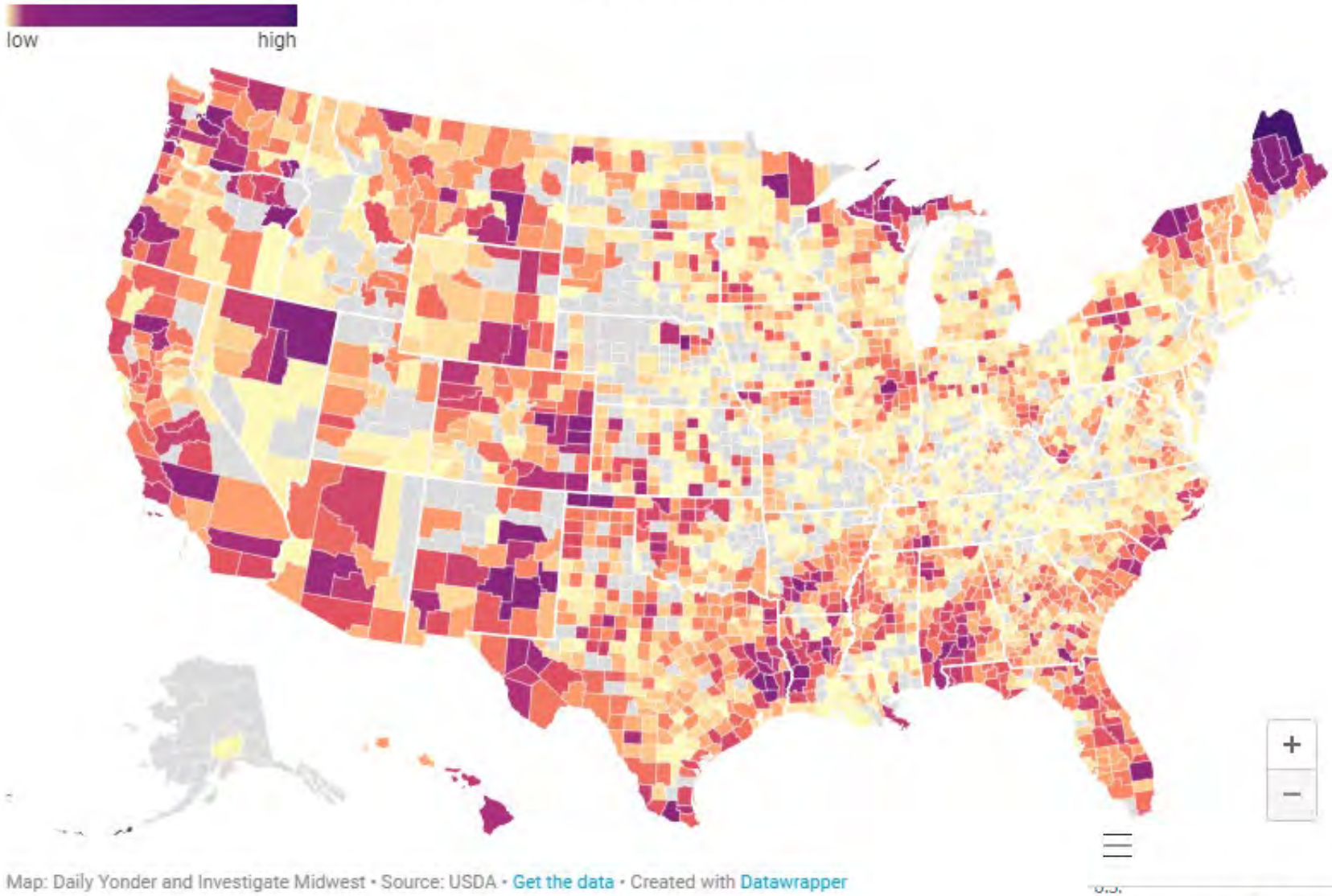
Data Visualization: Iowa Land Value Survey & CARD Farmland Portal





www.card.iastate.edu/farmland

Acreage of Foreign-Owned Farmland by County



Map: Daily Yonder and Investigate Midwest • Source: USDA • Get the data • Created with Datawrapper

Franklin County, New York

Number of Foreign Onwers: 71
Total Foreign-Owned Acres: 147,092

Largest Owners (up to 5)

Owner	Nation	Acres
Domtar Industries, Inc.	CAN	72,684
Connor Forest Industries, Inc.		17,049
Clerical Medical & Forestry Ltd.	GBR	11,595
Franklin Falls Timber Co., Inc.	BEL	10,871

https://investigatemidwest.org/2022/04/19/foreign-investment-in-us-cropland-nearly-triples-in-past-decade-usda-data-shows/

WSJ

House Republicans Ask GAO to Probe Foreign Ownership of U.S. Farmland

JOURNAL OF SOIL AND WATER CONSERVATION
The science and art of natural resource management for sustainability

What drives landowners' conservation decisions? Evidence from Iowa

W.P.M. Sawadgo, W. Zhang, and A. Plastina

Abstract: Conservation practices such as no-till and cover crops have been shown to have on- and off-farm benefits. However, when benefits of a practice do not go to the provider, underinvestment may occur. Farmland rental arrangements where tenants may not reap the benefits of conservation investments are a commonly cited barrier to conservation practice adoption in agriculture and may result in lower adoption rates on rented land than on owner-operated fields. This issue is especially important since more than half of Midwestern farmland is rented out. This article examines the factors driving adoption of four key conservation practices—no-till, cover crops, buffer strips, and ponds/sediment basins—using a statistically representative survey of Iowa landowners. We find evidence supporting the hypothesis that adoption is lower on rented land for cover crops, buffer strips, and sediment basins, but not for no-till. Our results also show that the large proportion of the state's land owned by nonoperating landowners and absentee landowners could present a barrier to increasing adoption of conservation practices. Furthermore, landowners seem open to increasing the use of cover crops in the immediate future, and a sizable number are even willing to incentivize tenants by paying for part of the cover crop planting cost. Finally, almost half of landowners would be willing to increase the area of their land under conservation practices if they could receive conservation-related tax credits or deductions, suggesting a potential policy strategy to increase adoption.

Key words: absentee landowners—conservation practice—cover crops—land tenure—nonoperating landowners—no-till

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Auburn University

Alabama Cooperative Extension System

Theme III: Chinese agriculture & its global trade implications

ELSEVIER

Journal of Asian Economics

Volume 69, August 2020, 101216

The U.S.–China trade war: Tariff data and general equilibrium analysis

Minghao Li, Edward J. Balistreri, Wendong Zhang

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https://doi.org/10.1016/j.asieco.2020.101216

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Abstract

The current trade war between the United States and China is unprecedented in modern history. This study introduces a database of tariff increases resulting from the trade war and quantifies the impacts using the canonical GTAPinGAMS model calibrated to the recently released GTAP version 10 accounts. We find that the remaining tariff increases as of March 2020 after the phase one trade deal decrease welfare in China by 1.7% and welfare in the United States by 0.2%. Impacts on sectoral revenue are reported for both countries. China's exports to and imports from the United States are reduced by 52.3% and 49.3%. The trade flow between the United States and China will be diverted to their major trade partners resulting in higher welfare in those countries, including many Asian countries. The estimated impacts are robust to using alternative trade elasticities and are amplified in the absence of the phase one tariff reductions.

Agribusiness

An International Journal

RESEARCH ARTICLE | Open Access

China's corn and biofuel policies and agricultural trade: Projections from an international agricultural commodity market model

Xi He, Miguel Carriquiry, Amani Elobeid, Dermot Hayes, Minghao Li, Wendong Zhang

First published: 09 August 2022 | https://doi.org/10.1002/agr.21764

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Abstract

We calibrate the Center for Agricultural and Rural Development International Agricultural Commodity Market model using 2019/20 marketing year crop data and 2020 calendar year livestock and biofuel data to project China's agricultural imports under six plausible policy scenarios focusing on ethanol, corn, and pork from 2021 to 2030. Our baseline projection reflects China's current policy of relaxing the tariff rate quota (TRQ) for corn and imposing ethanol tariff without any ethanol/gasoline blend mandate. Baseline projections show China's ethanol imports grow from 100 million liters in 2020 to 1.21 billion liters in 2030; however, they also show that China's corn and pork imports remain at high levels and peak in the 2022/23 marketing year. Compared with the baseline, adopting the ethanol mandate increases China's corn and pork imports, and resuming the corn TRQ increases China's ethanol and pork imports. Both the ethanol mandate and corn import restrictions shift US and global exports from corn to ethanol and pork products. These projections can serve as benchmark estimates of China's imports of major agricultural commodities in the next decade. [EconLit citations: Q17, Q18, Q11].

Published: 26 July 2022

A general equilibrium assessment of COVID-19's labor productivity impacts on china's regional economies

Xi He, Edward J. Balistreri, Gyu Hyun Kim ✉ & Wendong Zhang ✉

Journal of Productivity Analysis (2022) | Cite this article

371 Accesses | Metrics

Abstract

This study introduces a database for analyzing COVID-19's impacts on China's regional economies. This database contains various sectoral and regional economic outcomes at the weekly and monthly level. In the context of a general equilibrium trade model, we first formulate a mathematical representation of the Chinese regional economy and calibrate the model with China's multi-regional input-output table. We then utilize the monthly provincial and sectoral value-added and national trade series to estimate COVID-19's province-by-month labor-productivity impacts from February 2020 to September 2020. As a year-on-year comparison, relative to February 2019 levels, we find an average 39.5% decrease in labor productivity (equivalent to around 305 million jobs) and an average 25.9% decrease in welfare. Labor productivity and welfare quickly returned to the recent high-growth trends for China in the latter half of 2020. By September 2020, relative to September 2019, average labor productivity increased by 12.2% (equivalent to around 94 million jobs) and average welfare increased by 8.2%.

CHOICES

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What Have We Learned from China's Past Trade Retaliation Strategies?

Minghao Li, Wendong Zhang, and Chad Hart

JEL Classification: Q17, F10

Keywords: Agricultural Commodities, China, Tariff, Trade Retaliation

Citation: Li, M., W. Zhang, and C. Hart. 2018. "What Have We Learned from China's Past Trade Retaliation Strategies?" Choices. Quarter 2. Available online: http://www.choicesmagazine.org/choices-magazine/submitted-articles/what-have-we-learned-from-chinas-past-trade-retaliation-strategies

This article sheds light on some of China's agricultural trade retaliation principles by analyzing previous cases. China's responses follow three principles: (1) responding proportionally with restraint, (2) targeting substitutable products when possible, and (3) inflicting economic and political costs. With a more concrete understanding of China's motives and potential actions, U.S. policy makers and stakeholders can better evaluate the potential consequences of applying trade measures on China. Furthermore, as the trade dispute continues, any deviation from these principles on China's part may serve as a signal of the Chinese government's intention to escalate or deescalate the situation.

American Journal of Agricultural Economics

AAEA Agricultural & Applied Economics Association

Volume 103, Issue 3
May 2021
Pages 1082-1098

Article | Full Access

China's Missing Pigs: Correcting China's Hog Inventory Data Using a Machine Learning Approach

Yongtong Shao, Tao Xiong ✉, Minghao Li, Dermot Hayes, Wendong Zhang ✉, Wei Xie

Figures References Related Inform

Abstract

Small sample size often limits forecasting tasks such as the prediction of production, yield, and consumption of agricultural products. Machine learning offers an appealing alternative to traditional forecasting methods. In particular, support vector regression has superior forecasting performance in small sample applications. In this article, we introduce support vector regression via an application to China's hog market. Since 2014, China's hog inventory data has experienced an abnormal decline that contradicts price and consumption trends. We use support vector regression to predict the true inventory based on the price-inventory relationship before 2014. We show that, in this application with a small sample size, support vector regression outperforms neural networks, random forest, and linear regression. Predicted hog inventory decreased by 3.9% from November 2013 to September 2017, instead of the 25.4% decrease in the reported data.

New Mexico State University

Minghao Li

Department: Economics, Applied Statistics, and International Business

Title: Assistant Professor

Expertise:

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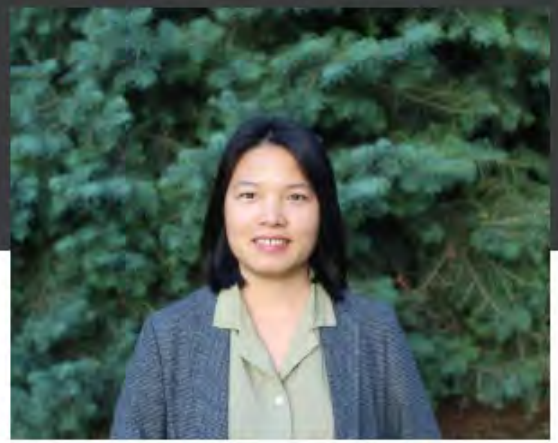
DEPARTMENT OF AGRICULTURAL AND APPLIED ECONOMICS

Xi He

Assistant Professor of Computational Economics



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Blacksburg, VA 24061

xih@vt.edu

Journal of Environmental Economics and Management
Volume 110, October 2021, 102566

Do homeowners benefit when coal-fired power plants switch to natural gas? Evidence from Beijing, China

Yingdan Mei [a], Li Gao [b], Wendong Zhang [c], Feng-An Yang [d]

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https://doi.org/10.1016/j.jeem.2021.102566

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Abstract

Coal-fired power plants are among the biggest air polluters both in China and globally. In 2013, China launched a pilot project to switch its power plants from coal to natural gas to curb coal-fired plants' detrimental effects on air quality. Debates about this policy mainly invoke the costs, but no study examines whether the change led to cleaner air and associated economic benefits. This article provides the first causal estimate of the capitalization effect of coal-to-gas conversion on housing prices. We estimate a triple difference model using housing transaction data from 2011 to 2015 and administrative data on all power plants in Beijing. Our results, although marginally significant, show that coal-to-gas conversion leads to a positive price premium of 11% for nearby properties. We provide suggestive evidence that our findings of positive price premiums are likely attributable to the reduction in air pollutants following the coal-to-gas switch, including a 4.9% reduction in particulate matter and 5.2% decrease in SO_2.

Food Policy
Volume 105, December 2021, 102150

A Fortune from misfortune: Evidence from hog firms' stock price responses to China's African Swine Fever outbreaks ☆

Tao Xiong [a], Wendong Zhang [b], Chen-Ti Chen [c]

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https://doi.org/10.1016/j.foodpol.2021.102150

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Highlights

- The African Swine Fever (ASF) outbreaks in China since 2018 have wiped out more than 100 million pigs, representing one-fifth of the global hog inventory.
- Event studies are conducted to quantify the financial impacts of outbreaks on Chinese and global hog companies.
- Results show significant and positive abnormal stock returns for hog companies following ASF outbreaks.
- The positive and increasing stock returns are driven by the expected deteriorated supply shortages, especially since the 2019 Chinese New Year.
- Our results suggest opportunities for consolidation, expansion, and upgrades of China's meat industry, and its global competitiveness.

Applied Economics Teaching Resources

AAEA Agricultural & Applied Economics Association

Extension Education

Nurturing International Graduate Students for a More Diversified and Inclusive Extension Workforce

Yangxuan Liu[a] and Wendong Zhang[b,c]
University of Georgia[a], Cornell University[b], Iowa State University[c]

JEL Codes: A23, Q16, Q18
Keywords: Economic education, Extension, diversity, graduate education, international graduate student, land-grant university

Abstract: The United States exports over 20 percent of its agricultural products; thus, agricultural trade and understanding global markets and partner countries' agricultural policies is increasingly important to its continued success. International graduate students represent a significant portion of agricultural economics students at many land-grant universities; however, many international graduate students do not receive exposure to Extension. We argue this creates an untapped resource to integrate graduate education and Extension services; thus, Extension misses opportunities to recruit top talent to serve the agricultural industry, and international graduate students have less job market success. Leveraging a survey of department heads and Extension economists in agricultural economics departments, our research documents the status of international Extension agricultural economists, identifies hidden and perceived barriers for international graduate students pursuing academic Extension careers, and provides insights into appropriate education and training programs in university graduate curricula to increase international graduate students' awareness of and interest in Extension.

States. Figure 2 illustrates US exports of four agricultural categories—bulk (e.g., corn, soybeans, wheat), intermediate (e.g., soybean meal and soybean oil), consumer-oriented (e.g., pork and beef products), and agriculture-related products (e.g., seafood and forestry products)—to high-income, upper-middle-income, lower-middle-income, and low-income countries from 1990 to 2020.

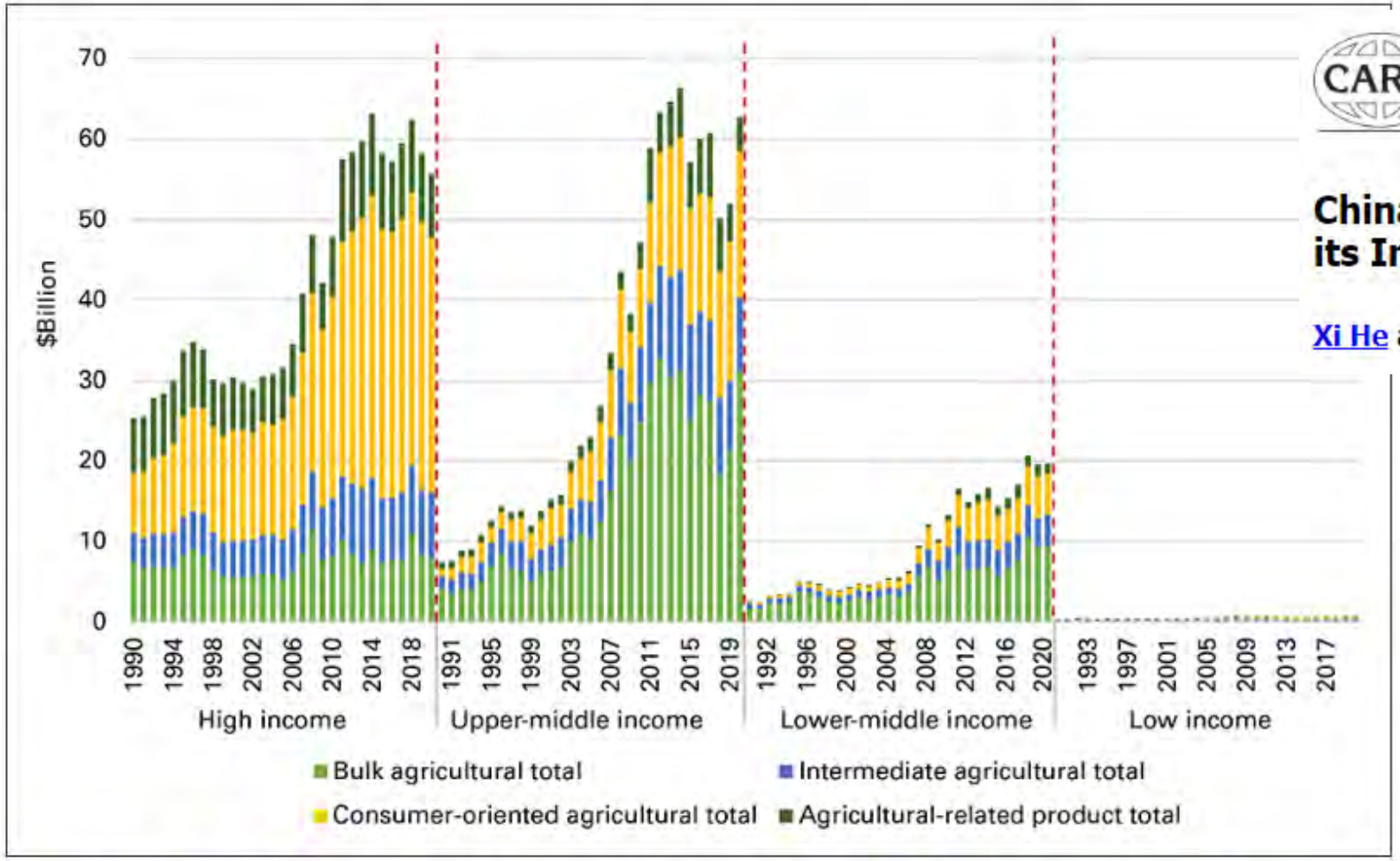


Figure 2. US exports of agricultural commodities to countries with different income levels.

Note: Based on data from USDA GATS (2021). We use World Bank's classification to classify countries into different income groups and use USDA's definition of agricultural products and classification of agricultural product categories.

CARD Agricultural Policy Review IOWA STATE UNIVERSITY Ames Iowa

China's Changing Population Structure and its Implications for US Agricultural Exports

Xi He and Wendong Zhang

https://www.card.iastate.edu/ag_policy_review/article/?a=122

US Agricultural Exports to China during the Phase One Trade Deal: Larger Pie, Smaller Slice?

Xi He, Dermot Hayes, and Wendong Zhang

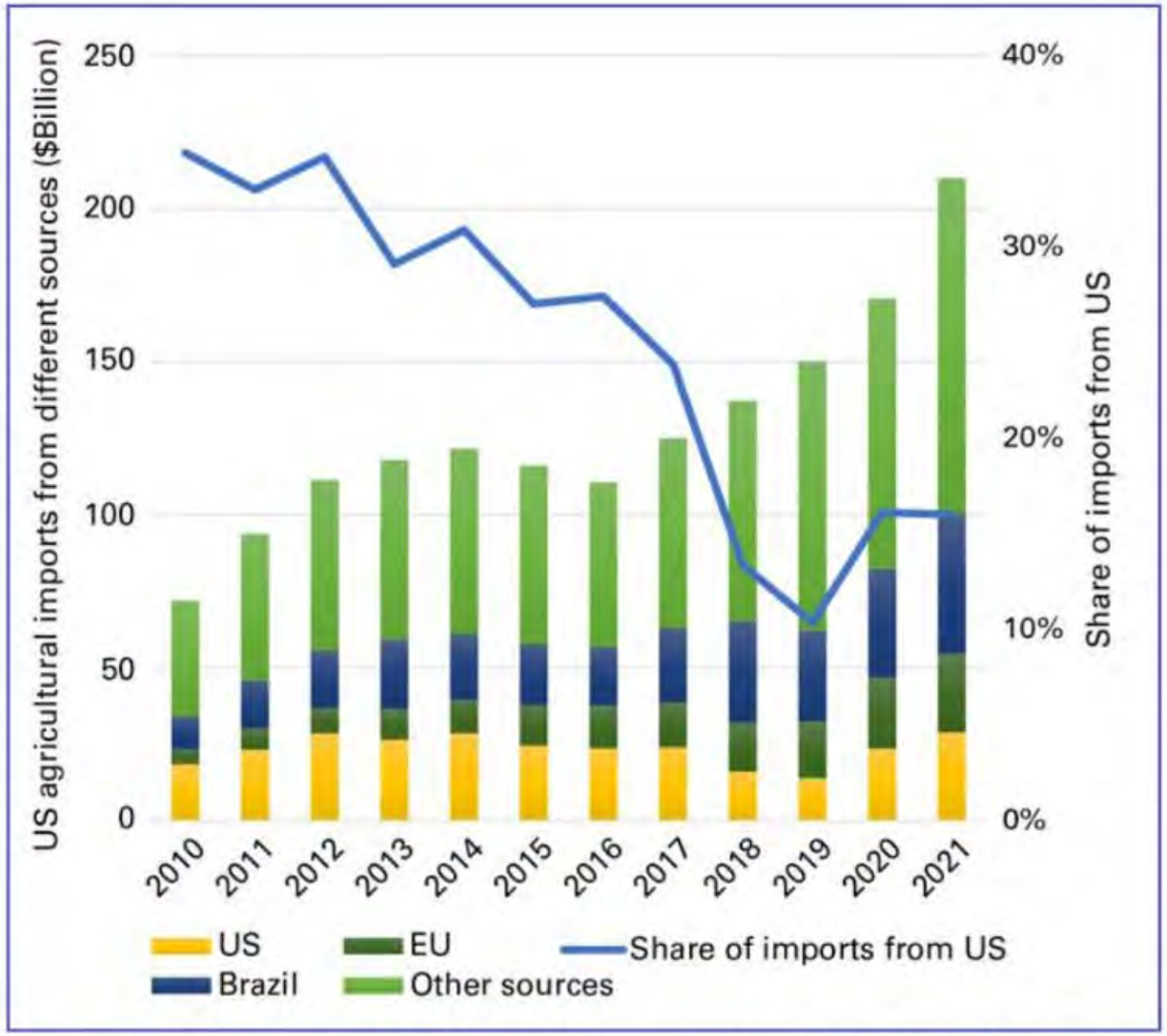


Figure 3. China's agricultural imports from the United States, EU, Brazil, and other sources.

Source: China's General Administration of Customs (2022).

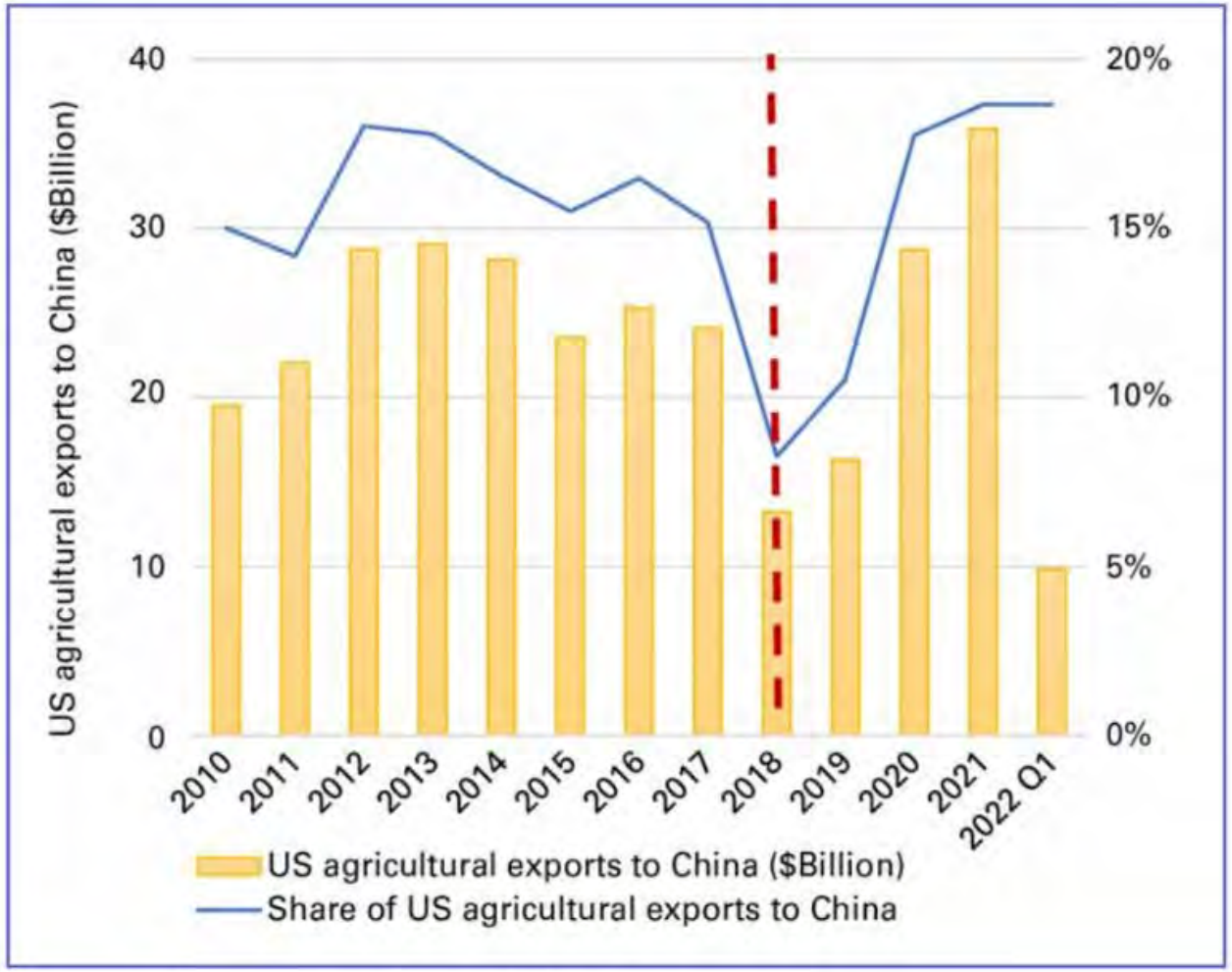
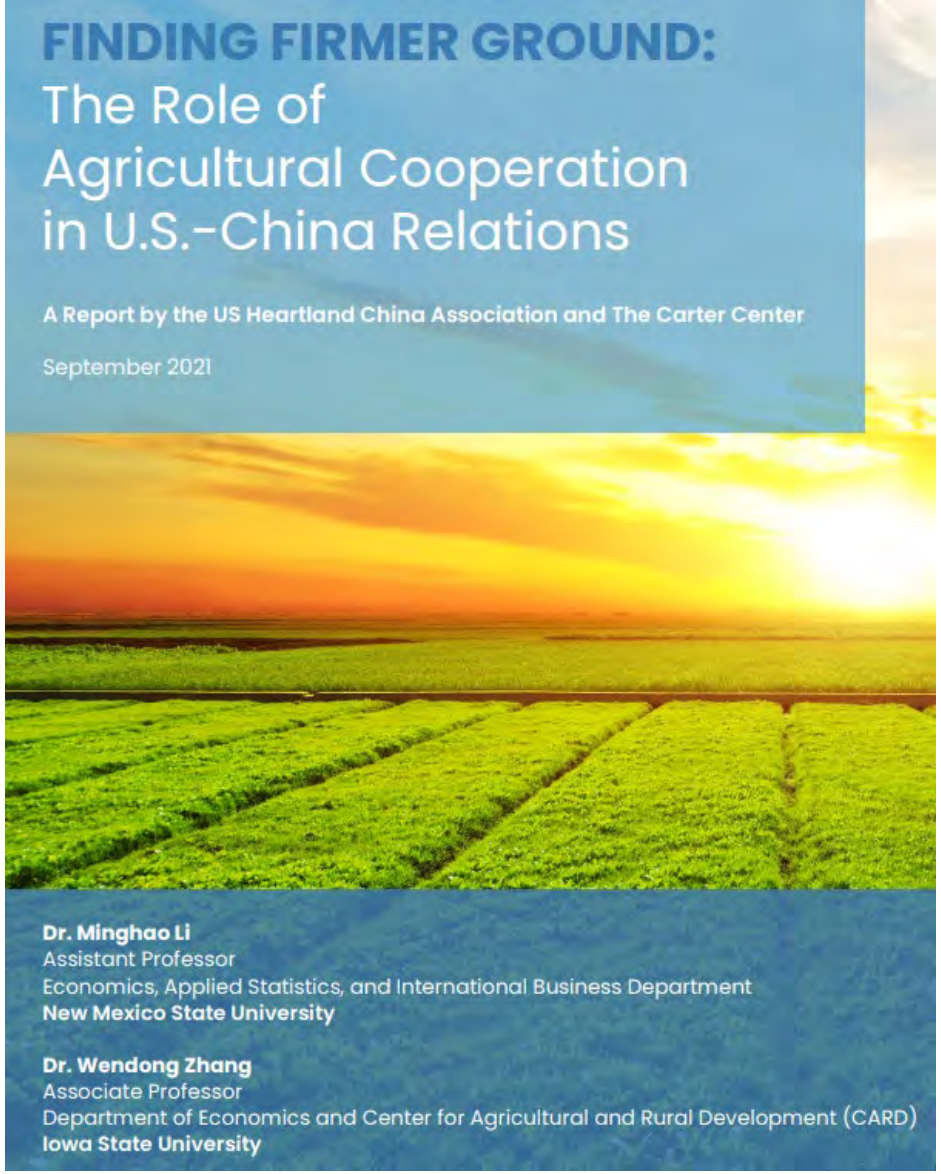


Figure 2. US agricultural exports to China.

Source: USDA GATS (2022). Data in 2022 is for the first quarter.



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Agriculture Committee Member, US Heartland China Association
Board of Director, Chinese Economists Society

https://usheartlandchina.org/wp-content/uploads/2021/09/Finding-Firmer-Ground-The-Role-of-Agricultural-Cooperation-in-US-China-Relations.pdf

Selected New Projects

- Energy Infrastructure & Farmland Market
  - Electricity transmission lines & nearby farmland and housing prices
  - Broadband expansion & farmland rent / values
- Social justice in agriculture & the environment
  - The role of gender in US farm succession
  - What women landowners want to know about conservation
  - Recreation demand by socially or economically disadvantaged households
- Trade and the environment

Thank you!

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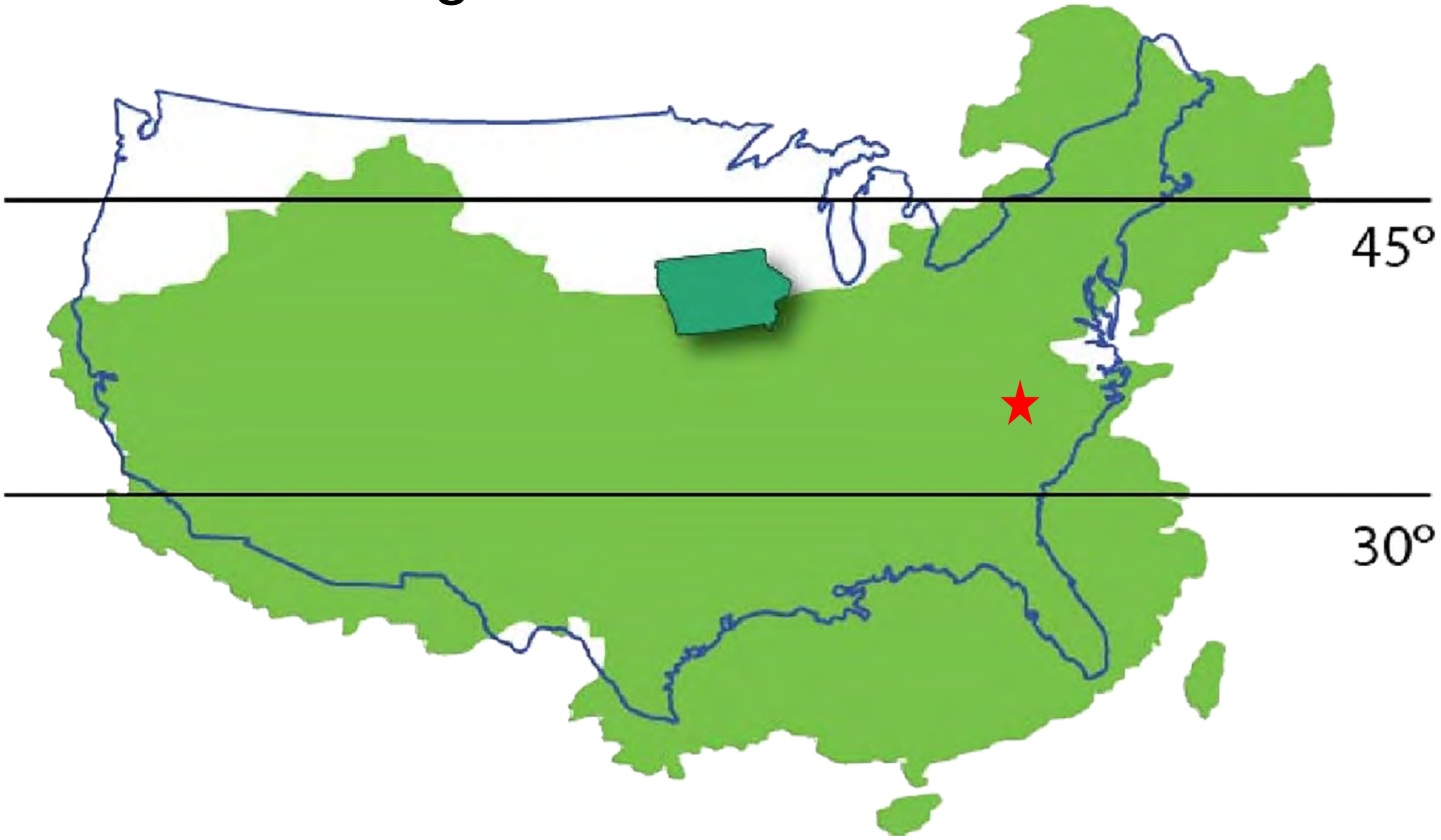
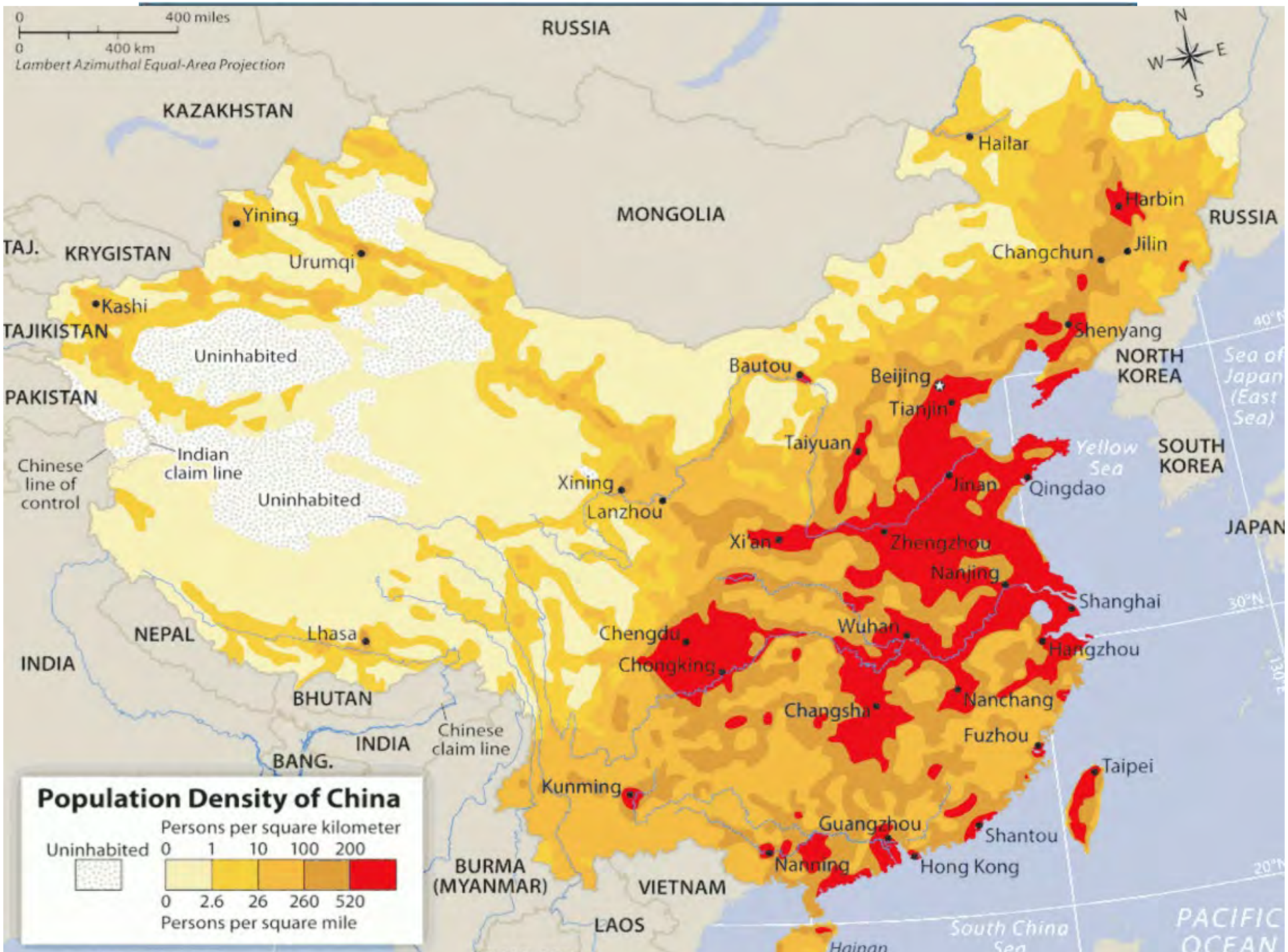
Dyson
Cornell
SC Johnson College of Business

Commodity Agriculture is Comparative Advantage for U.S., not China




0 400 miles
0 400 km
Lambert Azimuthal Equal-Area Projection
N
W
E
S
RUSSIA
KAZAKHSTAN
MONGOLIA
RUSSIA
TAJ.
KRYGISTAN
TAJIKISTAN
PAKISTAN
NEPAL
INDIA
BHUTAN
BANG.
INDIA
BURMA (MYANMAR)
VIETNAM
LAOS
NORTH KOREA
SOUTH KOREA
JAPAN
Sea of Japan (East Sea)
Yellow Sea
South China Sea
PACIFIC OCEAN
Hailar
Harbin
Changchun
Jilin
Yining
Urumqi
Kashi
Uninhabited
Uninhabited
Uninhabited
Chinese line of control
Indian claim line
Chinese claim line
Shenyang
Bautou
Beijing
Tianjin
Taiyuan
Xining
Lanzhou
Jinan
Qingdao
Xi'an
Zhengzhou
Nanjing
Shanghai
Wuhan
Hangzhou
Chengdu
Chongking
Lhasa
Changsha
Nanchang
Fuzhou
Taipei
Kunming
Guangzhou
Shantou
Nanning
Hong Kong
Hainan
40°N
30°N
20°N
130°E
Population Density of China
Persons per square kilometer
Uninhabited
0 1 10 100 200
0 2.6 26 260 520
Persons per square mile

China’s Provinces