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## “Value-At-Risk” in Agricultural Supply Chains – Summary

*Daniel O’Brien<sup>1</sup>: Western Economics Forum Fall 2022 Issue Lead Editor*

“Value-At-Risk” in Agricultural Supply Chains is the focus of the Fall 2022 issue of the Western Economics Forum. The editorial team of Matthew Elliott, David Ripplinger, Aleksan Shanoyan, Hernan Tejeda and Daniel O’Brien recognized the increasing relevance of supply chain-related challenges in agriculture – both domestic and foreign. And given the financial impacts on agriculture when associated supply chains do not function effectively, the editors chose to approach this broader issue in the economic framework of “Value-At-Risk.”

Different types of factors can cause Agricultural Supply Chains to be at risk. These include naturally occurring factors such as widespread disease outbreaks (such as COVID-19), weather extremes and associated climate variation. Global factors impacting ag supply chains can include variation in ocean freight rates and countries’ currency valuations, logistical transportation and storage issues, periodic shortages in key international agricultural inputs such as fertilizers or pesticides, and tight labor supplies in various countries. Domestic U.S. and global political and legal factors such as country-to-country geopolitical conflicts and trade disagreements, as well as differences in energy policy and ag production and processing regulations may also impact agricultural supply chains.

There are four articles in this issue dealing with these topics. They are: “A Portrait of Firms that Trade in Meat Products” by Schweizer, Steinback and Zhuang; “Effect of Diversification on Farm Resilience: Evidence from Kansas” by Lindbloom, Davtyan, Shanoyan and O’Brien; “Global Animal Protein Trade Impact of Largescale Human Health Events” by Marks, Thompson, Upendram and Yu; and “Investigating the Growth of Brazilian Agricultural Exports” by Schweizer and Yildirim. A brief description of each follows below

A fifth article originates from the 2022 WAEA Annual Meeting Grain Student Paper competition. “Livestock Risk Protection: Selecting Optimal Coverage Contracts for Producers” by Haviland and Feuz was one of the papers selected for presentation at the 2022 Annual meeting. These authors choose to publish their paper in this issue of the WEF as was offered to them. Congratulations to these agricultural economists in the early stages of their career!

### **Editor Team for the Fall 2022 issue of the Western Economics Forum:**

Matthew Elliott, South Dakota State University

David Ripplinger, North Dakota State University

Aleksan Shanoyan, Kansas State University

Hernan Tejeda, University of Idaho

Daniel O’Brien, Kansas State University

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## **A Portrait of Firms that Trade in Meat Products**

Heidi Schweizer, Sandro Steinbach, and Xiting Zhuang

This study provides an integrated view of U.S. firms that engage in international meat trade, focusing on a constructed dataset linking firm-level trade transactions to a unique panel on U.S. business activities from 2010 to 2020. This novel dataset enables us to examine several dimensions of firm activity in the meat industry, including how many different products firms trade, how many countries with which firms trade, the characteristics of those countries, and the concentration of foreign sales across firms. The authors find that significant market concentration implies that meat processing and foreign trade disruptions could have system-wide consequences beyond the United States.

## **Effect of Diversification on Farm Resilience: Evidence from Kansas**

Michael Lindbloom, Nash Davtyan, Aleksan Shanoyan, and Daniel O'Brien

The concept of system resilience has emerged to complement conventional risk management options and is defined as the ability of a system to withstand predicted or unpredicted disturbance through development of effective buffering and adaptive capabilities. This study uses 47 years of farm-level data from the Kansas Farm Management Association database to calculate a diversification index and a resilience index of a farm  $i$ , during time period  $t$ , and specify an econometric model to estimate the effect of diversification and other farm characteristics on farm resilience. The contribution of this study is threefold. First, it presents the first application of the resilience triangle method at the individual farm level. Second, it provides empirical evidence of the effect of diversification and other farm characteristics on resilience. Third, it highlights potentially fruitful areas for future research on farm resilience.

## **Global Animal Protein Trade Impacts of Largescale Human Health Events**

Mary Lynn Marks, Jada M. Thompson, Sreedhar Upendram, and T. Edward Yu

Despite the emergent literature on COVID-19, little has been done to collectively identify and analyze the effects of largescale human health events on animal protein trade. Using export trade data from 2010-2020 for animal protein exporters, this analysis estimates the effects human health events (i.e., MERS-Cov, COVID-19, Ebola, and Zika virus) on global animal protein trade for 23 individual commodities (6-digit HS level). Results show heterogeneity between diseases, products, and exporters. This heterogeneity indicates differences in response between events, dependent on event size, scope, and impacts. The study results can help improve preemptive business continuity planning and deepen the understanding of the implications of future emerging largescale health events on the meat industry.

## **Investigating the Growth of Brazilian Agricultural Exports**

Heidi Schweizer and Yasin Yildirim

Many explanations have been offered for the rapid rise of Brazilian market share in the global marketplace such as increased agricultural land, infrastructure improvements, and a supportive

policy environment. Using a gravity model where the dependent variable is the value of Brazilian agricultural exports to its trading partners, the authors examine the collection of factors commonly included in explanations of Brazilian agricultural and export growth between the years 1996-2018. Specifically, they include measures for currency depreciation, domestic agricultural policies, improvements to internal infrastructure (rail and road), changes in agricultural inputs like land use and technology adoption, as well as the standard set of explanatory origin/destination variables such as bilateral trade agreements. Their results show that agricultural export flows are dominantly associated with domestic factors including changes in agricultural inputs and transportation infrastructure.

### **Livestock Risk Protection: Selecting Optimal Coverage Contracts for Producers**

Logan B. Haviland and Ryan Feuz

The authors evaluate the optimal producer-selected coverage options comprised of coverage length and level for each marketing month for feeder cattle steers (600-900lbs.) insured with Livestock Risk Protection insurance. The optimal contracts are identified as those which have historically provided the highest probability of a positive net return and the highest average net return. They find that, regardless of marketing month, the optimal contracts consist of relatively high coverage levels whereas the optimal length of the contracts varies across months. The results are compared against actual policies purchased to evaluate whether producer decision patterns align with the current findings.