



AgEcon SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

What has Been the Impact of COVID19 on Agricultural Trade? An Initial Empirical Assessment

Shawn Arita, Jason Grant, and Sharon Sydow

Selected presentation for the International Agricultural Trade Research Consortium's (IATRC's) 2020 Annual Meeting: Economic Implications of COVID-19, December 14-15, 2020, Virtual platform.

Copyright 2020 by Shawn Arita, Jason Grant, and Sharon Sydow. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

What has been the impact of Covid19 on Agricultural Trade? An initial empirical assessment

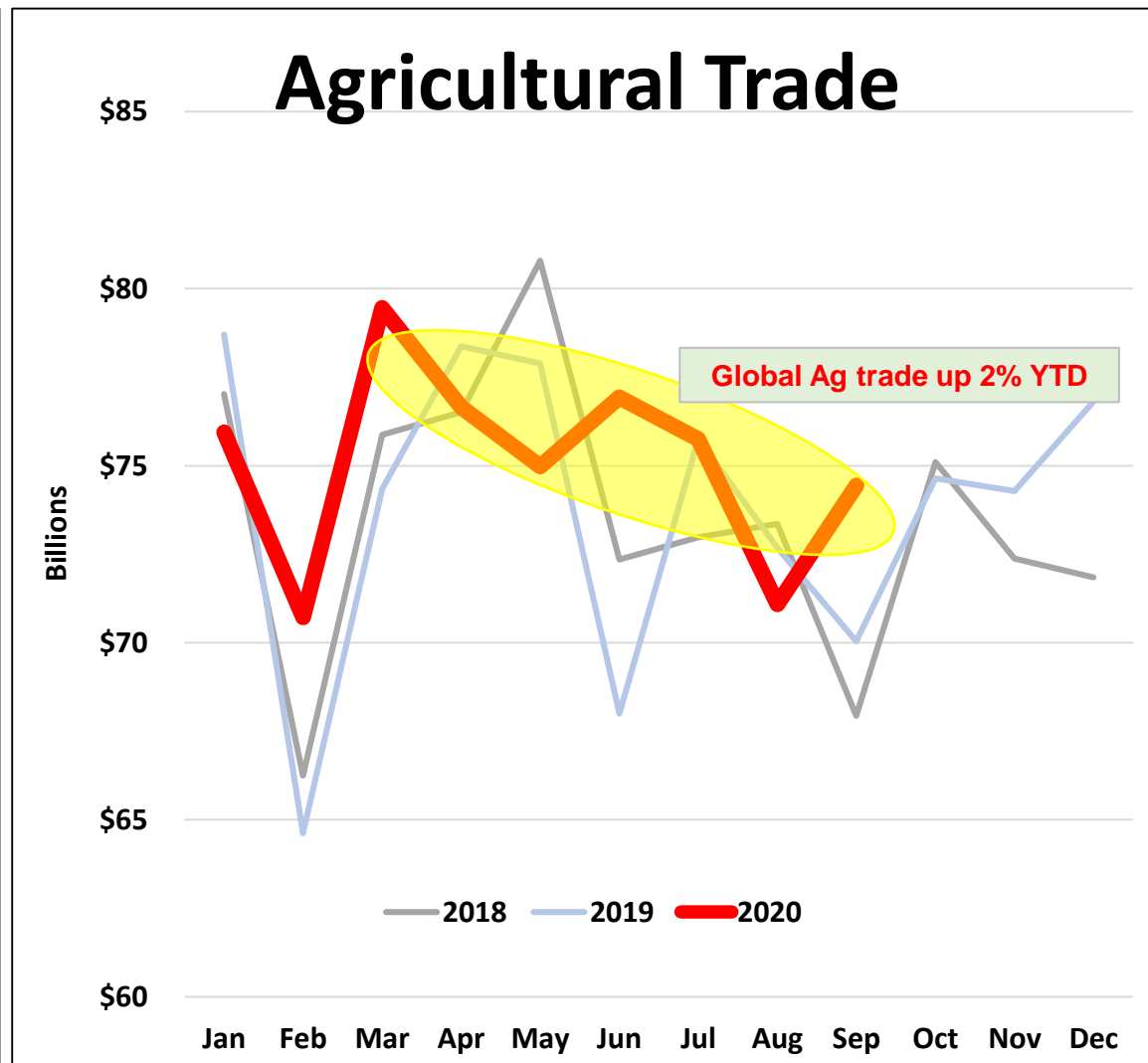
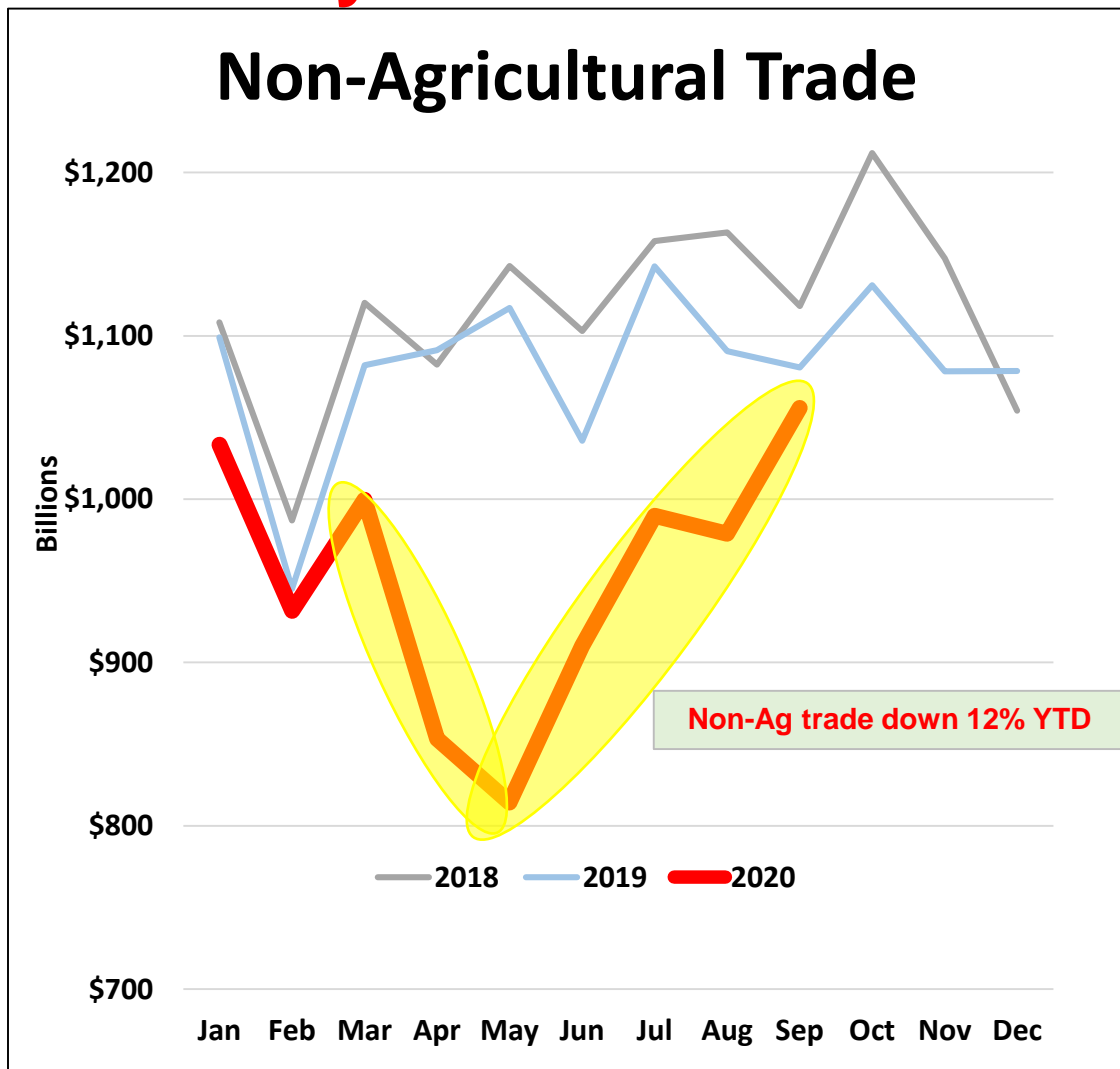
Shawn Arita¹, Jason Grant², and Sharon Sydow¹

¹Office of the Chief Economist, USDA

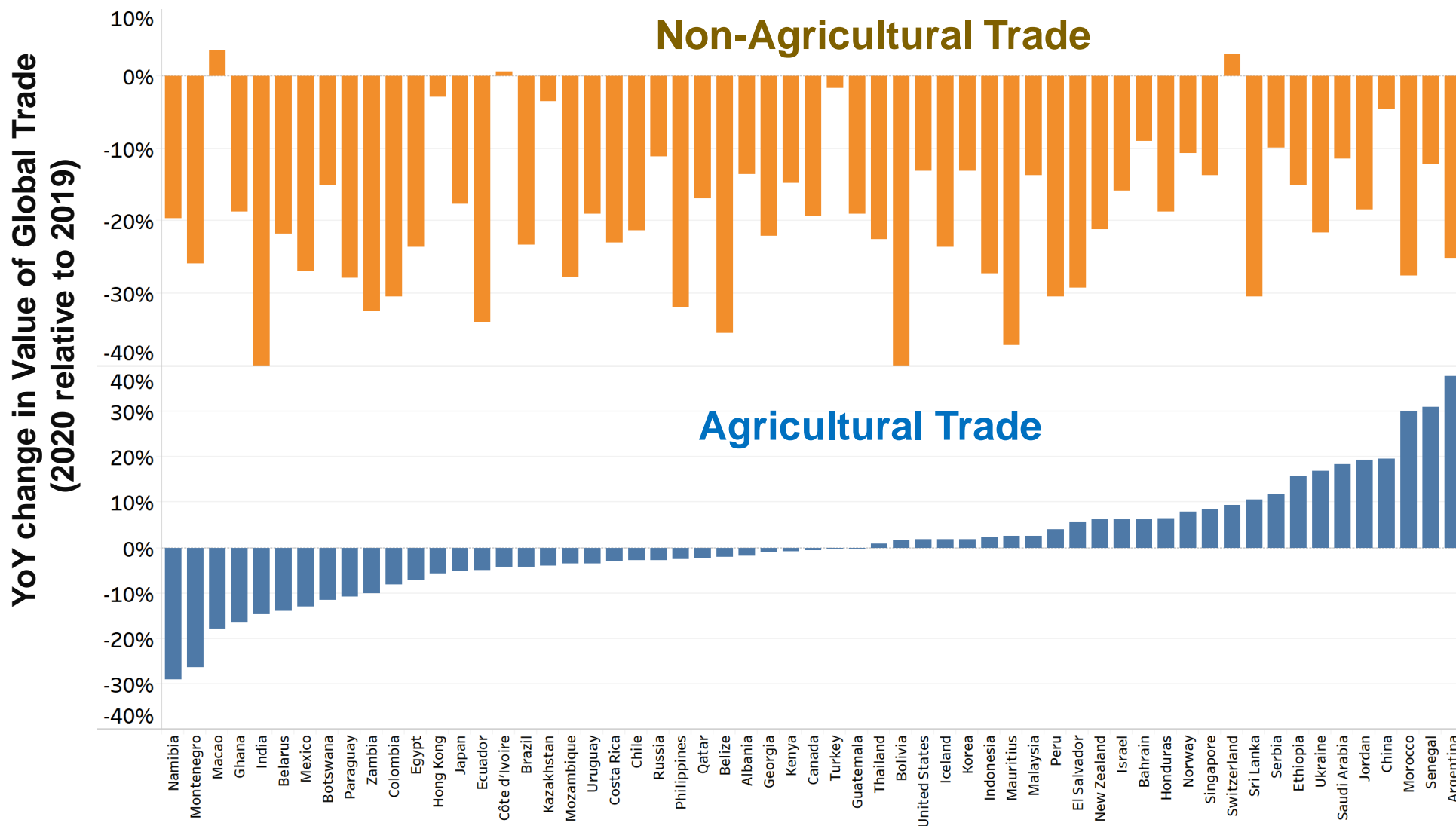
²Virginia Tech

The findings and conclusions in this article are those of the authors and do not represent any official U.S. Department of Agriculture or U.S. Government determination or policy.

Data indicates that Global Agricultural Trade has been relatively stable under Covid19

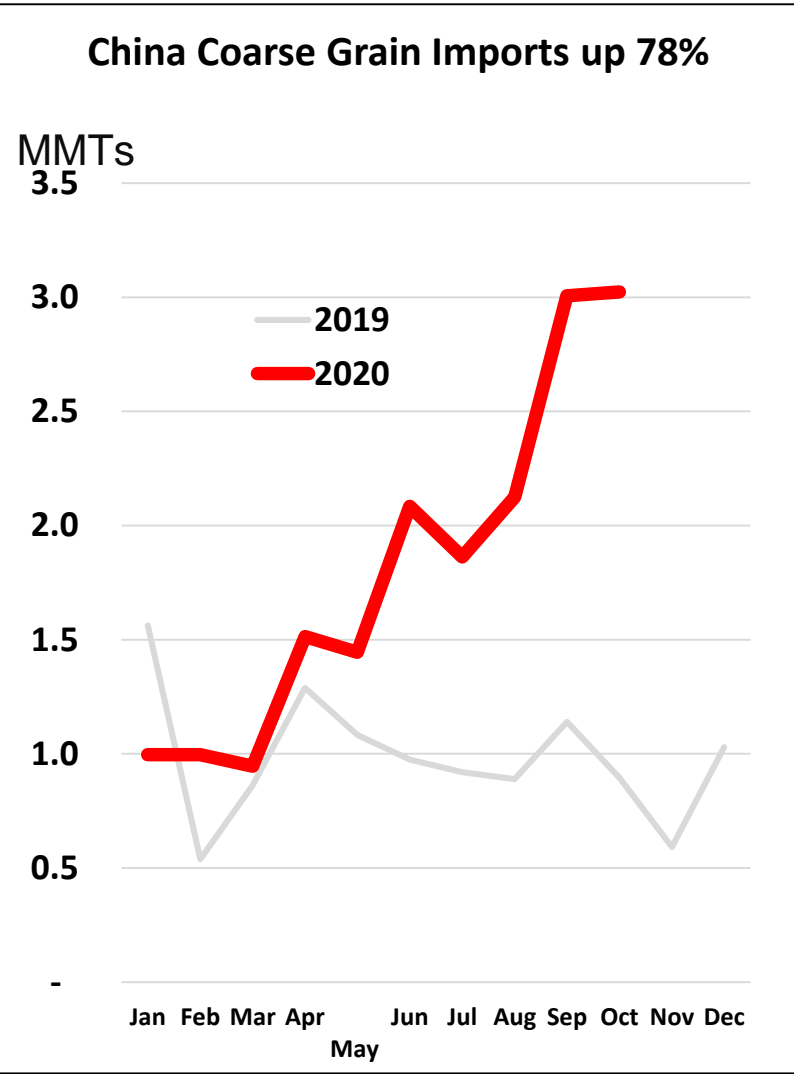
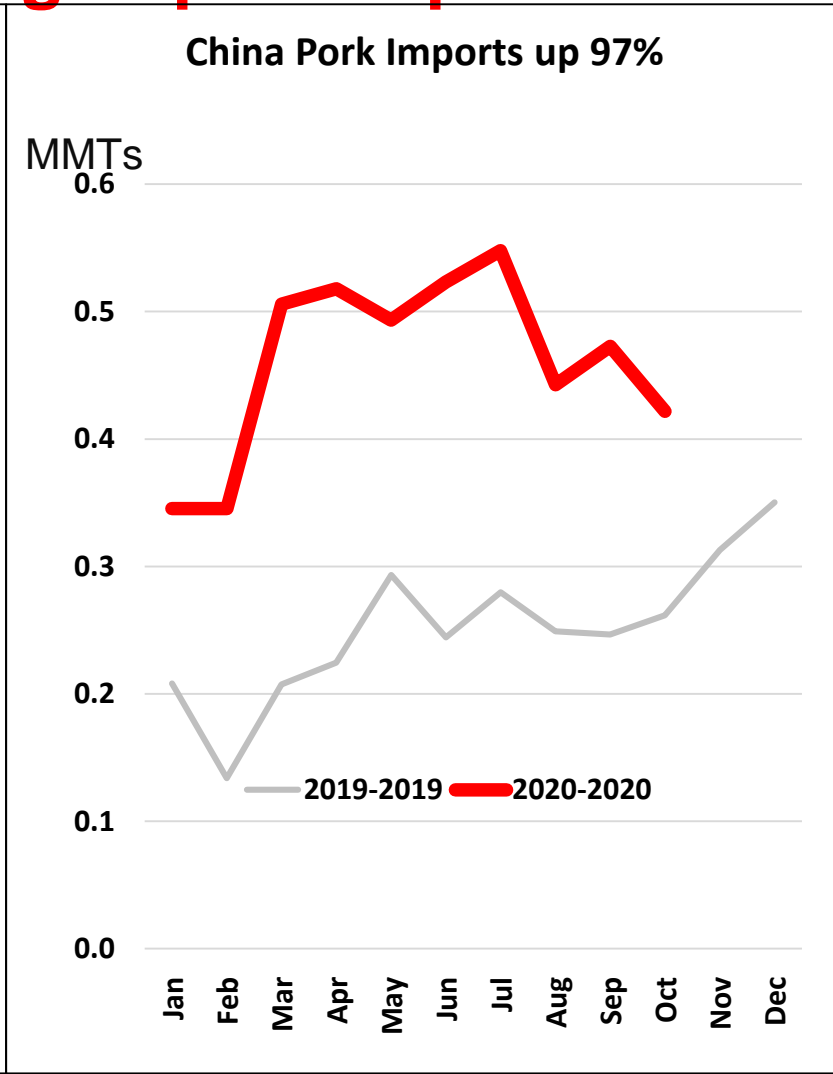
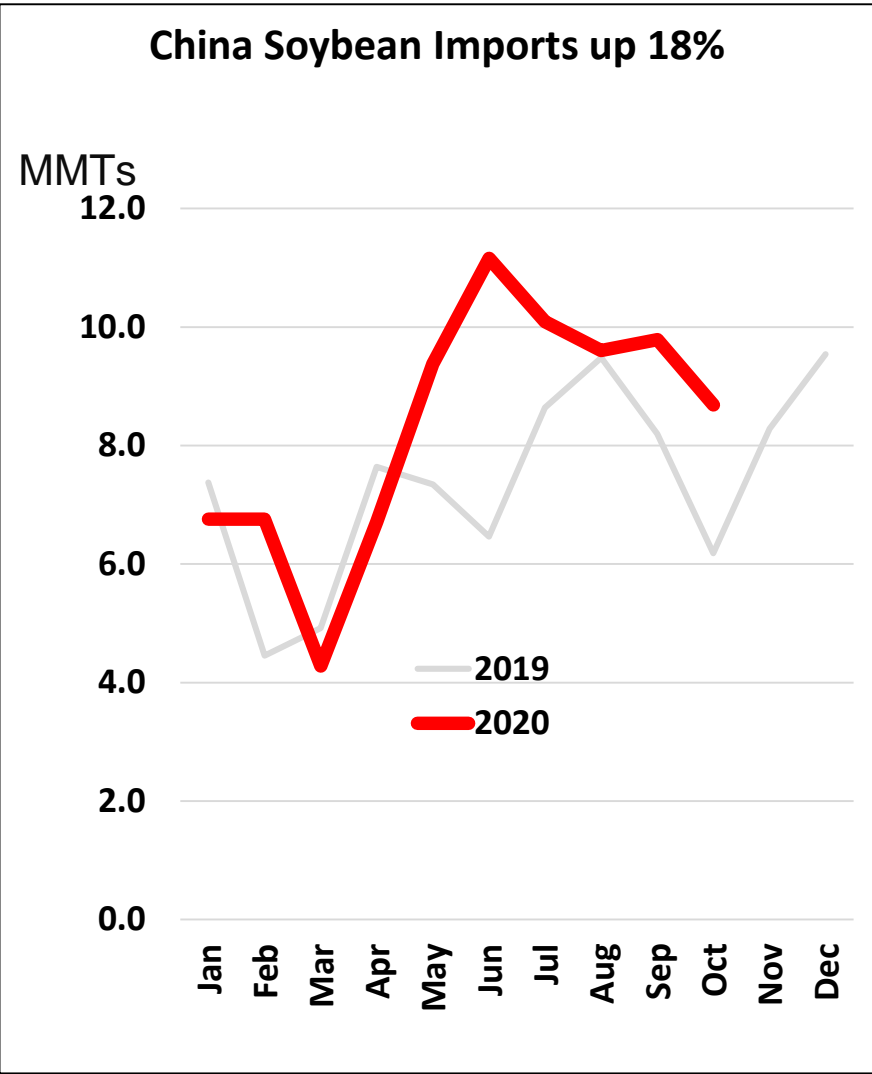


Uneven changes in Agricultural trade across countries in 2020



Covid19 not the only factor affecting Ag markets in 2020

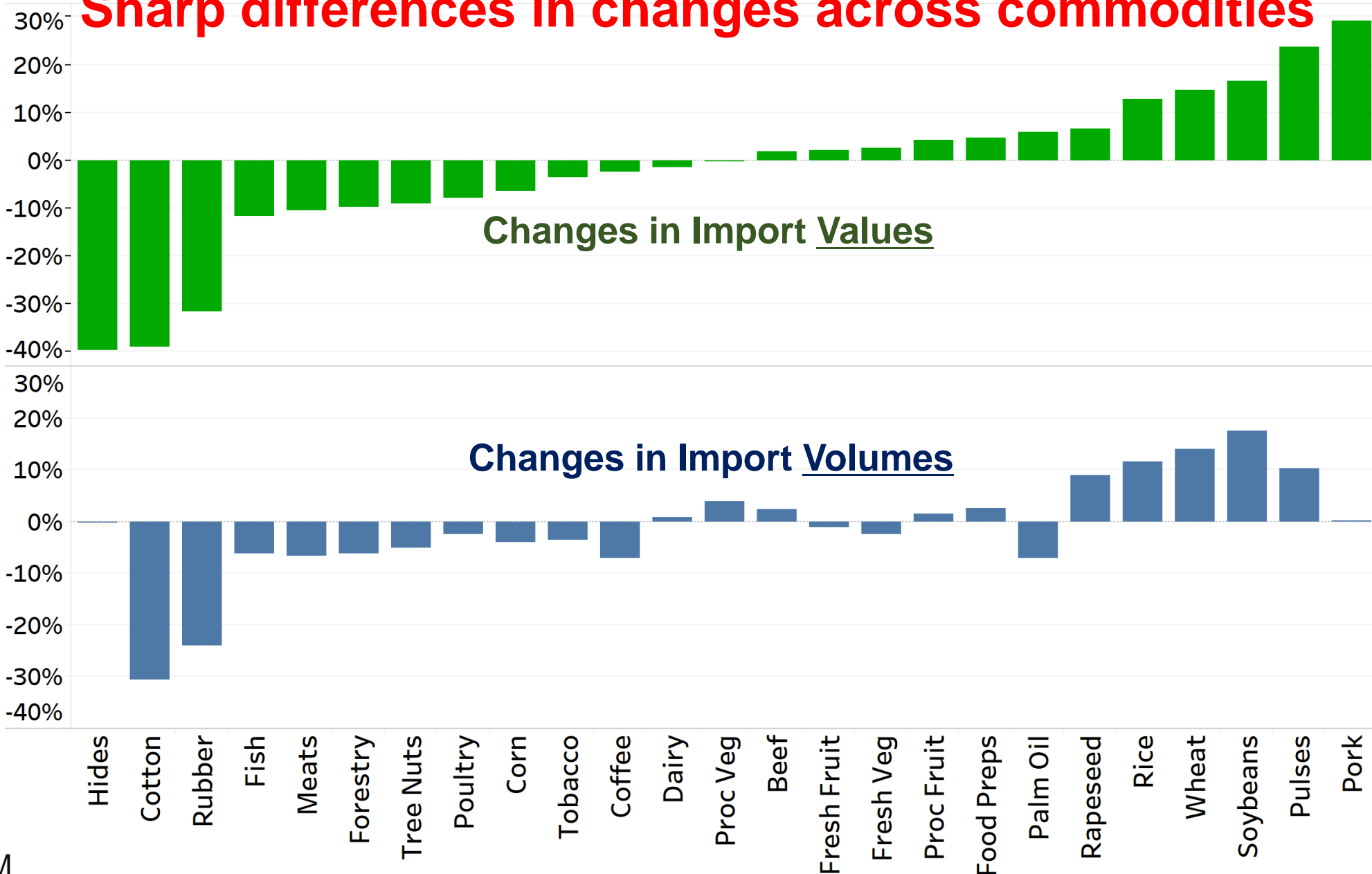
China Ag Imports up 18% 2020



Data: TDM

Sharp differences in changes across commodities

YoY change in Value of Global Trade
(2020 relative to 2019)



Empirical Questions

Main Economic Question—what has been the impact of Covid19 on agricultural trade?

- **Recent trade data trends indicates ‘resilience’ of agricultural trade flows, at least in aggregate.**
 - **Raises the quantitative question of to what extent/how much?**
 - **Further, which commodities/markets have been more resilient than others?**
 - **What is the nature of resilience? How does the effect vary across type of covid19 impact?**

Methodological questions—can we econometrically identify the impact from Covid19 from other factors? Is there sufficient data and variation?

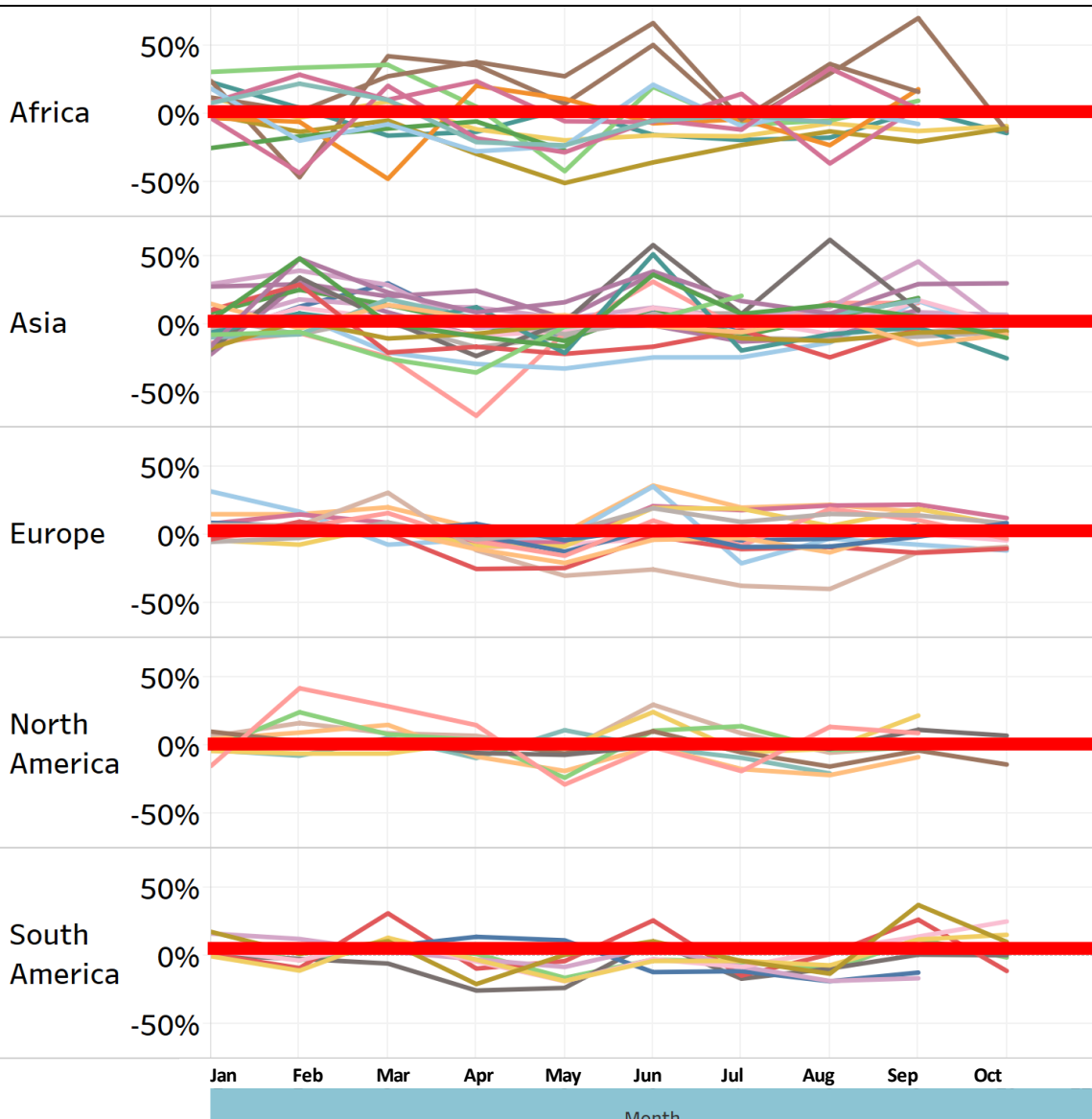
Econometric Specification

$$\Delta M_{jq,t,t-1}^S = FE_j + \theta_1 [\Delta COVID_{jq,t,t-1}] + \varepsilon_{iqt}$$

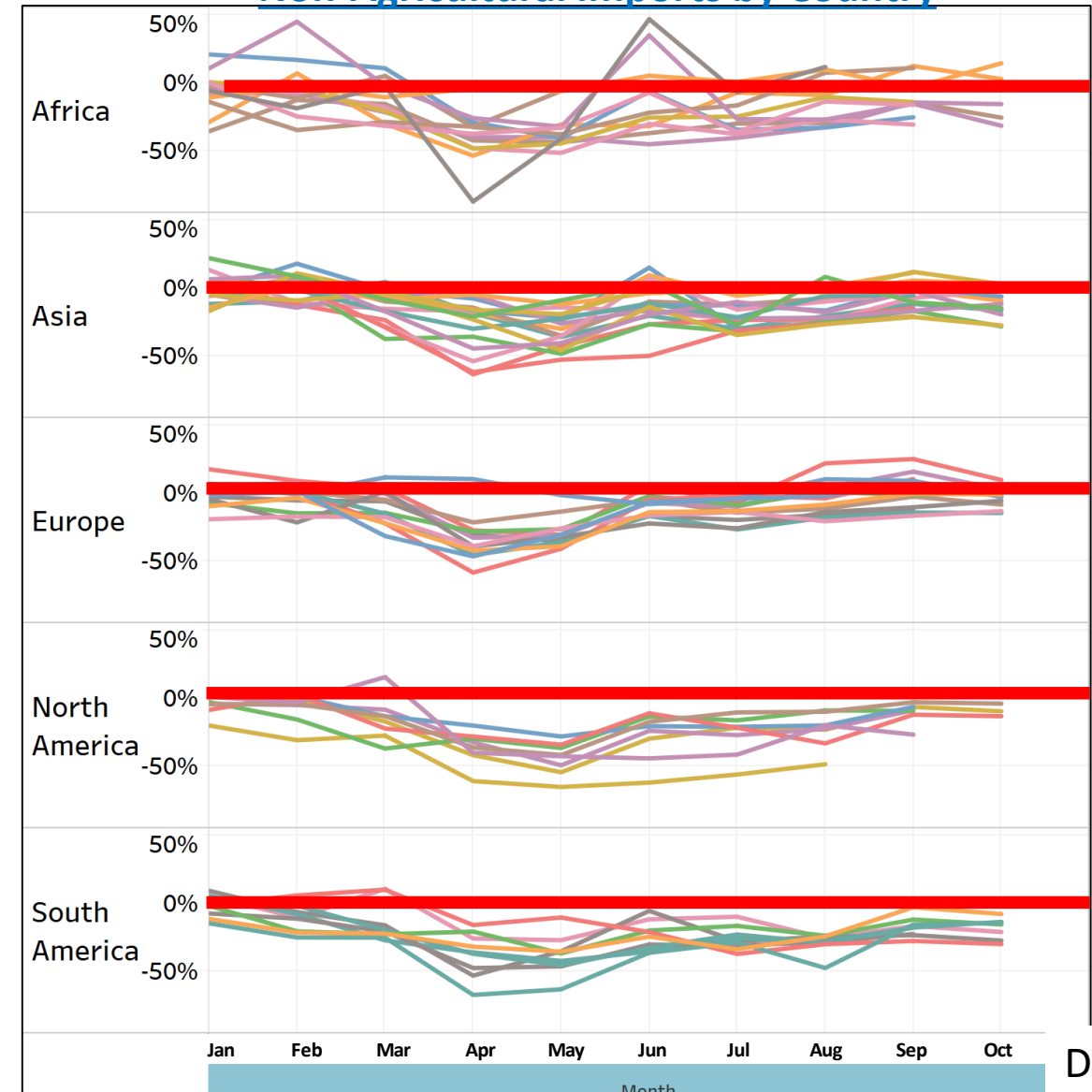
- where, ΔM_{iqt} is the YoY percent change in imports in period (quarterly or monthly) q and year t from $t = 2020$ to $t-1 = 2019$ by importer j in sector S
- FE_j are importer fixed effects (FE) to control for import growth heterogeneity
- $\Delta COVID_{jq,t}$ is a measure of Covid19 related impacts:
 - Direct outbreaks: increase in the number of coronavirus cases/deaths reported in importing country j per million people.
 - Policy Response: Oxford Policy Stringency Index in importing country m [1-100 index]
 - De facto lockdown effect: Community Mobility indicator in importing country [deviation from pre-covid baseline] using workplace and retail people traffic

2020 YoY Change in Trade by month (% change, same month of previous year)

Agricultural (Aggregate) Imports by Country

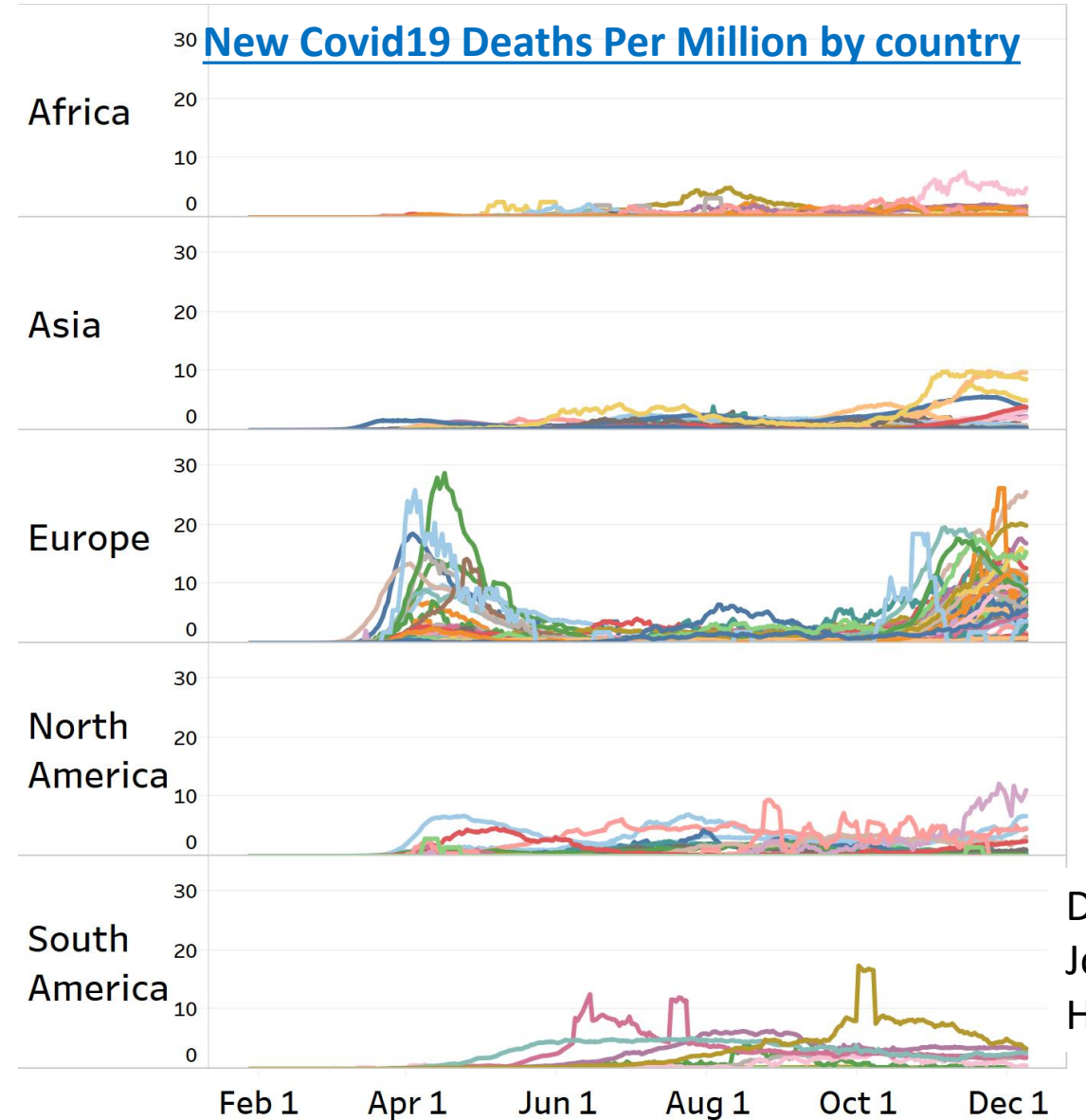
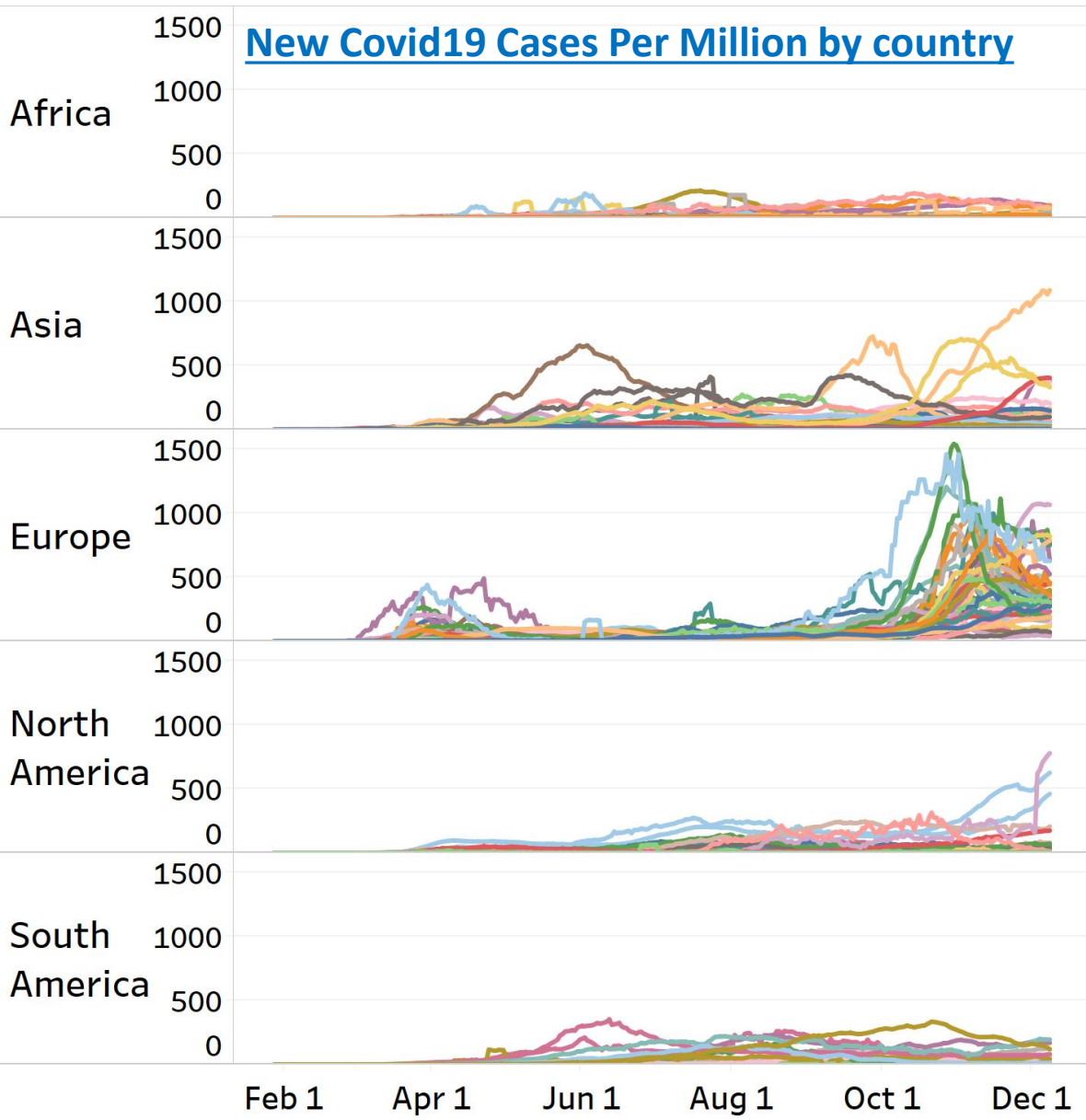


Non-Agricultural Imports by Country



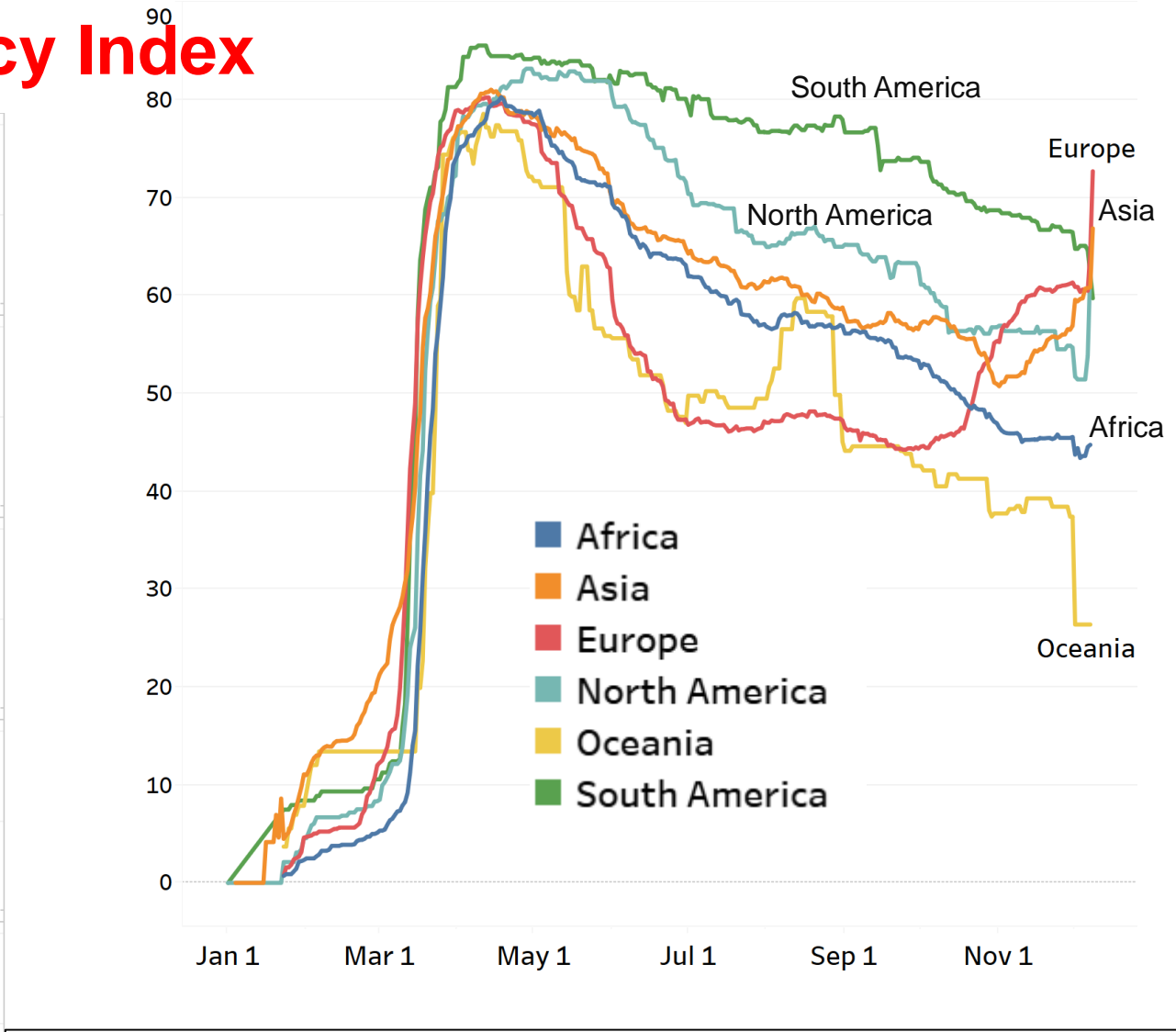
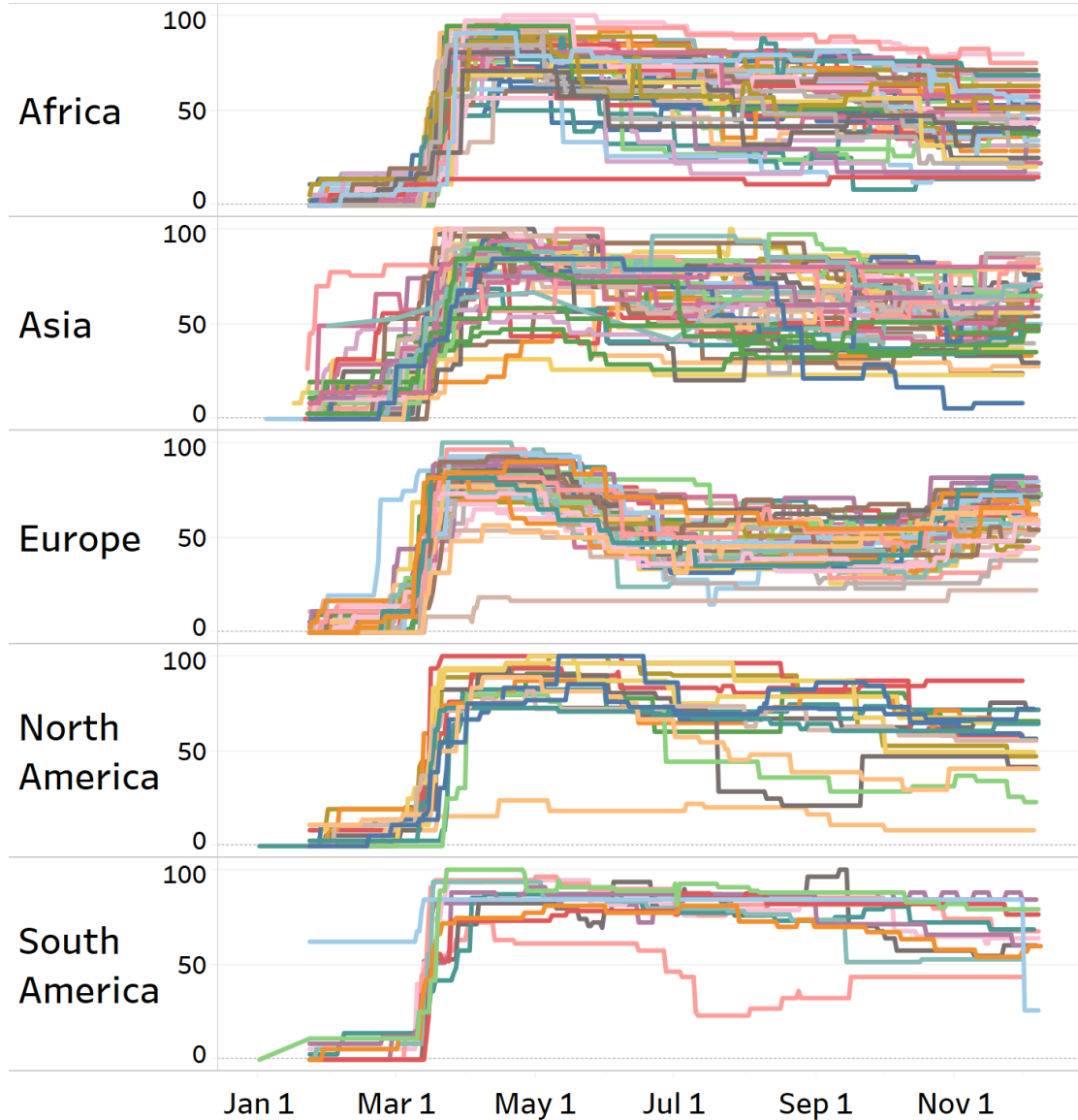


Covid19 Incidence Rates



Data:
John
Hopkins

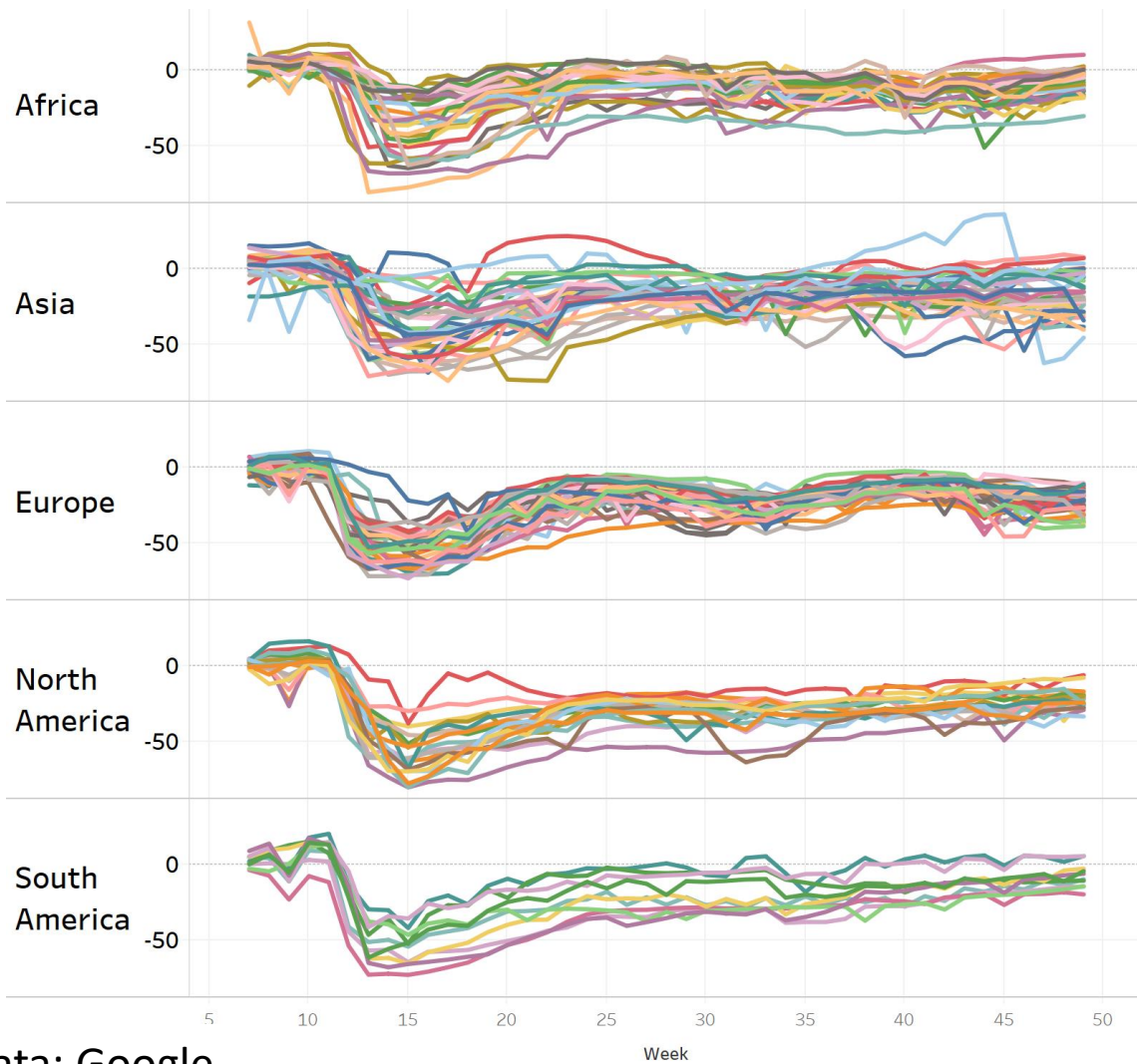
Policy Restrictions: Stringency Index



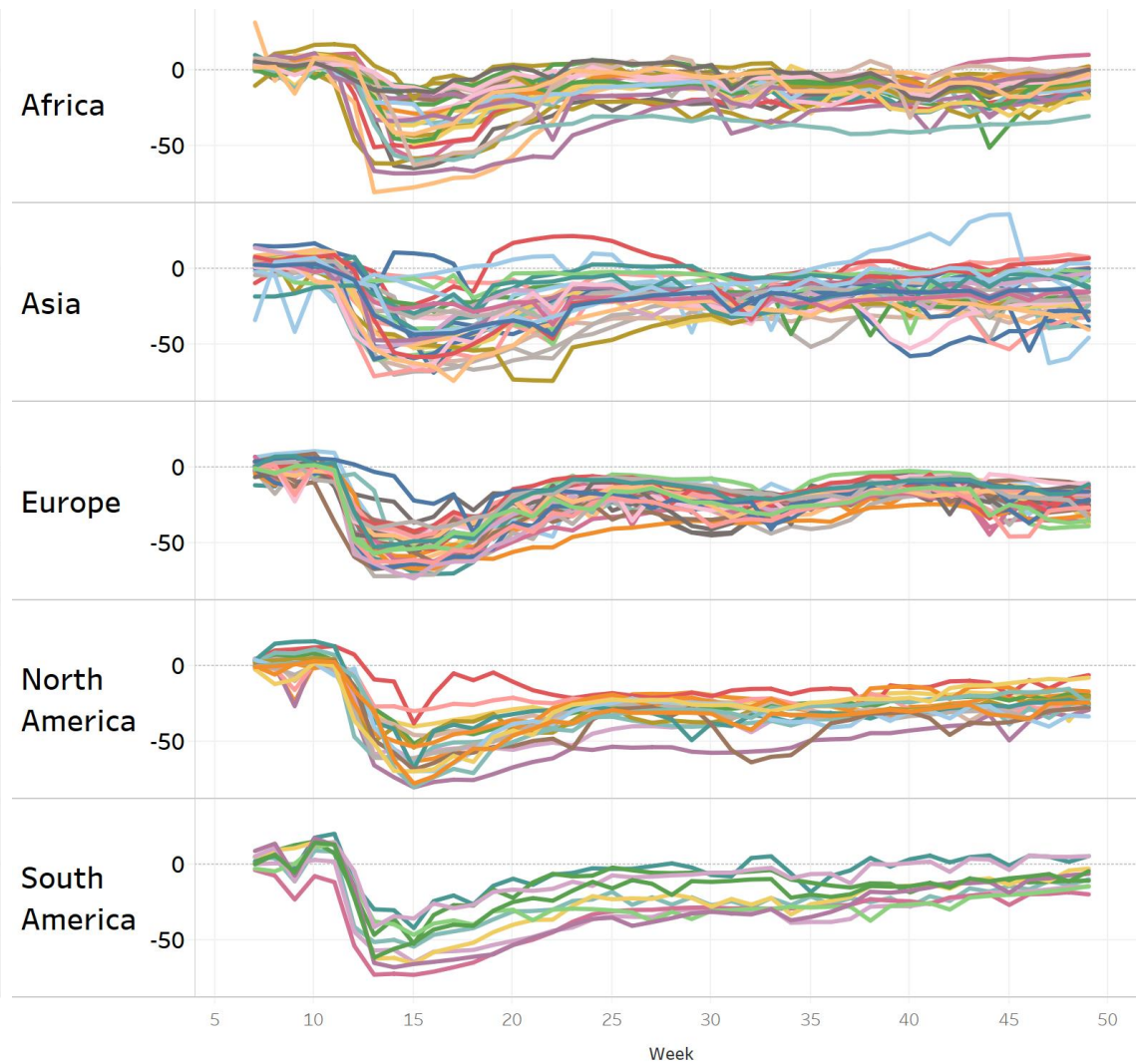
Oxford Stringency Index: includes 1) school closings, 2) workplace closings, 3) cancellation of public events, 4) restrictions on gatherings, 5) closing public transport, 6) Stay at home orders, 7) Restrictions on internal movement, 8) International travel controls

De facto Lockdown: Community Mobility

Workplace Mobility Traffic



Retail Mobility Traffic



Initial Econometric Results: Ag vs. Non-ag sectors (quarterly)

	(1) Ag	(2) Non-Ag	(3) Ag	(4) Non-Ag	(5) Ag	(6) Non-Ag	(7) Ag	(8) Non-Ag	(9) Ag	(10) Non-Ag
New Cases per mil	-0.000 (0.00)	-0.000*** (0.00)								
New Deaths per mil			-0.011 (0.01)	-0.021*** (0.01)						
Policy Stringency					-0.076* (0.04)	-0.322*** (0.03)				
Mobility, Retail							0.128* (0.06)	0.567*** (0.04)		
Mobility, Workplace									0.215*** (0.08)	0.764*** (0.06)
N	180	180	180	180	177	177	168	168	168	168
R ²	0.723	0.614	0.725	0.616	0.744	0.784	0.755	0.835	0.761	0.838
Projected effect on trade	-	-	-0.9%	-1.7%	-5.1%	-21.4%	-4.2%	-17.8%	-5.4%	-18.8%

Notes: Dependent variable is the percentage change in quarterly imports from the same quarter of the previous year. Estimation includes country fixed effects (not reported) and standard errors are in parentheses and robust to clustering by country. *, **, *** denote statistical significance at the ten, five, one percent levels.

Coefficient Results Disaggregated by ag product

Impact on Import Values										
	1. Beef	2. Coffee	3. Corn	4. Cotton	5. Dairy	6. Fish	7. Forestry	8. Fruits	9. Hides	10. Meats
New Deaths per mil	-0.118**	-0.034	0.022	0.069	-0.044***	-0.001	0.016	-0.042***	-0.188**	0.001
Policy Stringency	-0.640***	-0.521**	-1.679	-0.475	-0.108	-0.177*	-0.266***	-0.201**	-0.636*	-0.173*
Mobility Retail (inverse)	-1.113***	-0.929**	-0.436	-0.773	0.002	-0.279	-0.661***	-0.332**	-1.538*	-0.363**
Mobility Workplace (inverse)	-1.589***	-0.891**	-2.315	-0.878	-0.151	-0.417*	-0.886***	-0.338*	-3.124	-0.467**
	11. Pork	12. Poultry	13. Vegetables	14. Pulses	15. Rice	16. Soybeans	17. Sugars	18. Tree Nuts	19. Veg Oils	20. Wheat
New Deaths per mil	-0.011	-0.110***	-0.037***	0.098	-0.029	0.578	-0.034	-0.076**	0.014	-0.047
Policy Stringency	-0.121	-0.081	-0.357***	1.086**	0.541***	7.743	-0.106	-0.384**	-0.088	-0.054
Mobility Retail (inverse)	0.025	-0.143	-0.451***	0.940**	0.992**	4.044	-1.175*	-0.326	-1.102*	0.003
Mobility Workplace (inverse)	0.072	-0.425	-0.690***	1.357**	1.546***	11.398	-0.419	-0.635*	-1.286	-0.111

Impact on Import Volumes										
	1. Beef	2. Coffee	3. Corn	4. Cotton	5. Dairy	6. Fish	7. Forestry	8. Fruits	9. Hides	10. Meats
New Deaths per mil	-0.127*	-0.054***	0.083	0.059	-0.026	0.014	0.035	-0.023	0.002	0.004
Policy Stringency	-0.544***	-0.513*	-1.452	-0.647**	-0.014	-0.101	-0.262***	-0.138	-0.156	-0.119
Mobility Retail (inverse)	-1.375***	-0.877	-0.937	-1.190**	-0.005	-0.168	-0.869***	-0.11	-0.503	-0.601**
Mobility Workplace (inverse)	-0.934**	-1.019*	0.869	-0.929**	0.089	-0.083	-1.096*	-0.232	-0.435	-0.425**
	11. Pork	12. Poultry	13. Vegetables	14. Pulses	15. Rice	16. Soybeans	17. Sugars	18. Tree Nuts	19. Veg Oils	20. Wheat
New Deaths per mil	0.013	-0.025	-0.052***	0.075	-0.007	0.678	-0.017	-0.003	-0.028	-0.094
Policy Stringency	-0.123	0.094	-0.459***	0.782*	0.453**	12.06	0.831	-0.538*	-0.136	-0.114
Mobility Retail (inverse)	-0.024	-0.514	-0.871***	0.940*	1.390***	18.703	0.13	-0.579	-0.991	-0.038
Mobility Workplace (inverse)	-0.248	-0.595	-0.543***	0.716	0.966**	7.08	-1.047	-0.239	-0.839	0.235

Notes: Estimates have been performed separately. Dependent variable is the percentage change in quarterly imports from the same quarter of the previous year and includes country fixed effects (not reported). Standard errors are in parentheses and robust to clustering by country. *, **, *** denote statistical significance at the ten, five, one percent levels.

Summary

- **Empirically examined the impacts of the global pandemic on agricultural trade.**
- **Some initial evidence that Covid19 has affected ag trade flows; however, relatively weak in aggregate**
- **Estimate a lockdown effect of a ~5% reduction in agricultural trade; relationship with direct Covid19 incidence rates limited**
- **Significant heterogeneity across ag sectors**
 - **e.g. beef, cotton, hides, meats, fish, forestry hardest hit commodities; pulses, rice experienced increase import demand; soybeans and pork insignificant**

Comments welcomed

Save the Date! USDA's 97th Annual Agricultural Outlook
Forum: February 18-19, 2021

*Building on Innovation: A Pathway to
Resilience*



shawn.arita@usda.gov