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An Initial Ex Post Assessment

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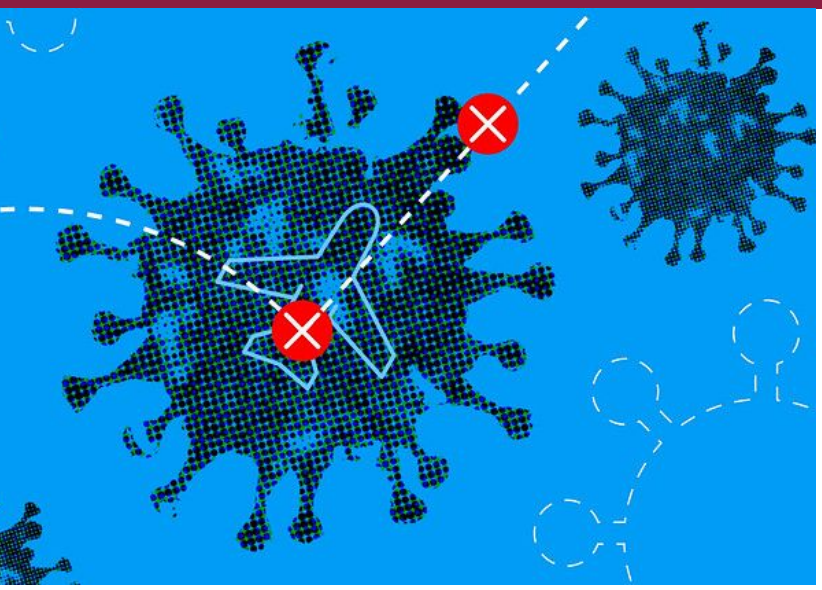

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Abstract: This paper conducts an early econometric examination of the impacts of COVID-19 on international trade. We find the pandemic reduced global agricultural trade by 4.2% in the 2nd and 3rd quarters of 2020. Agricultural trade was found to be significantly more stable than non-agricultural trade; however, the level of disruption varies substantially across commodities.

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**** The views and opinions expressed here are those of the authors and do not represent any official U.S. government determination or policy***

Introduction

Disruptions to food and agricultural trade are not new. The Great Recession of 2007-2009 had marked one of the most significant collapses in trade with global agricultural trade plummeting almost 20% (almost 30%for non-agricultural exports); yet the economic expansion period that followed was one of the longest on record. In 2018, a trade dispute between the United States and China and several other trading partners led to a significant escalation in applied tariffs and a resulting decline in agricultural and merchandise trade (Crowley 2019; Bown 2018; Bown 2019; Amiti et al. 2019; Grant et al. 2019). In 2020, the COVID-19 pandemic challenged the global economy, spreading to 216 countries and regions around the world, decreasing and even shuttering economic activity, and threatening the lives of 7.6 billion people.

In response to the pandemic, national governments imposed unprecedented measures, including lockdowns, shelter-in-place orders, and the promotion of remote business and education to thwart the spread of COVID-19. Many of these policies led to significant economic damage by discouraging large gatherings and outright closures of non-essential businesses including restaurants, bars, shopping centers, and attractions. Recent evidence suggests that lockdowns have worked to slow the spread of the virus but at considerable economic costs (Fajgelbaum, Khandelwal, Kim, Mantovani, and Schaal 2020).

Short-term economic indicators are suggestive of a major economic contraction in the United States due to the pandemic not seen since the Great Depression (Orden 2020). Unemployment burgeoned in just a few weeks from less than 5% to nearly 15% as firms laid off or furloughed workers, and second quarter U.S. GDP estimates showed a contraction of 9.5% (32.9% on an annualized basis).

Given the lag in data availability, we are only beginning to observe some of the COVID-19 impacts on international trade. Table 1 presents data on imports of Vehicles and Parts, Aircrafts, Electronics (i.e., TVs and cell phones), and agricultural products, globally and individually for the top three trading nations – the United States, EU, and China during the first 6 months of 2020 relative to the same period in 2019. For all goods (agricultural and non-agricultural), global imports are down 12% year-over-year, or $770 billion through the first six months of 2020 relative to 2019. Total U.S. and EU imports are down 13% and 14%, respectively, whereas China's total imports are down 6.5%. Some sectors, however, have been more exposed to the pandemic than others. For example, the pandemic has essentially halted global air travel. Not surprisingly, global imports of aircrafts and related parts are down 38%, or $33 billion, compared to the same period in 2019. Notably, China's aircraft imports in 2020 are down 73%, declining from $10.8 billion in January-June 2019 to $2.8 billion in the first six months of 2020.

Table 1. Year-to-Date Percentage Changes in Selected Merchandise and Agricultural Products, 2020 relative to 2019

	All Products	Vehicles and Parts Thereof	Aircraft & Parts Thereof	Electronics	Agriculture
Global Imports (January-June)					
Year-to-Date %Δ in Imports Relative to 2019	-12%	-28%	-38%	-4%	3%
Value Change ($ Billion)	$770	$129	$33	$41	$12.2
% Change in U.S. Imports	-13%	-33%	-24%	-11.5%	1.6%
% Change in EU Imports	-14%	-23%	-37%	-9.1%	0.6%
% Change in China Imports	-6.5%	-23%	-73%	7.3%	16.4%

Source: Authors' calculations from *Trade Data Monitor*.

Global trade in motor vehicles and parts has also been impacted by the pandemic, as transportation has slowed and the economy has declined, with imports down 28%, or $129

billion, in 2020 relative to 2019. U.S. imports of motor vehicles are down 33%, compared to 23% in the EU and China.

Conversely, imports of discretionary electronic items such as TVs, cell phones, monitors, and others are down only 4% year-over-year, or $41 billion. The lower decline of consumer-based electronic products may reflect the fact that consumers can purchase these items online without the need to visit a retail store. Imports for food and agricultural products is one of the bright spots in Table 1, with global trade actually up 3% in the first half of 2020 compared to 2019. As indicated in Table 1, the overall increase in agricultural imports is driven in part by a significant increase in China's agricultural imports of 16.4% in 2020. Much of the increase in China's agricultural imports has come from Brazil as the Real depreciated significantly in 2020.

In summary, the total trade numbers through June of 2020 are broadly consistent with an initial outlook the WTO released in April, which forecast declines in the value of global trade in 2020 of -8.1%, -16.5% and -20.4% under a V- (optimistic), U- (less optimistic), and L-shaped (pessimistic) set of economic recovery scenarios, respectively (WTO 2020a). In October, the WTO updated the outlook for global trade to fall 9.2% in 2020, with trade growth of 7.2% in 2021 (WTO 2020b). However, overall declines in global trade mask significant heterogeneity at the country and sector level. For example, the WTO also forecast a significant reduction in the value of agricultural exports by -6.5%, -11.2%, and -12.7% across the three scenarios. Table 1 shows that agricultural trade has not fallen as originally predicted.

The purpose of this article is to conduct an early ex-post examination of the impact of the COVID-19 pandemic on U.S. and global agricultural trade. Specifically, this article addresses the following empirical questions:

i) What has been the observed changes year to date of U.S. and global agricultural exports under the pandemic? How do these trade flow changes compare with previous trade shocks? How unique is the impact of this crisis on trade flows?

ii) Are there particular sectors or countries within the global agricultural trading system that are relatively more susceptible to global health shocks of this magnitude?

iii) What is the quantitative impact of COVID-19 on agricultural versus non-agricultural trade, and to what extent do COVID-19 cases and mobility trends associated with shutdowns explain changes in agricultural and non-agricultural trade?

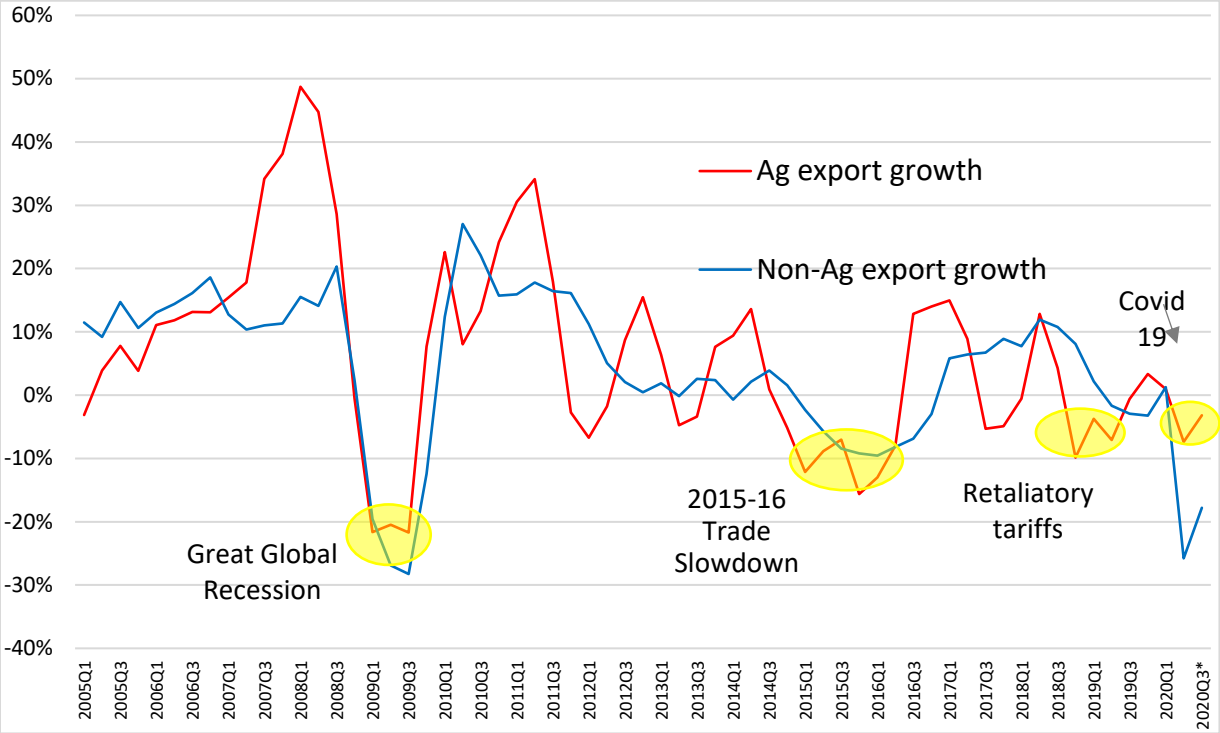
Using the latest available trade data, this article provides an initial look at how COVID-19 has affected agricultural trade and outlines key impacts that can be observed thus far.

I. Impacts on U.S. and Global Agricultural Exports

Growth of U.S. and Global Agricultural trade slowed under COVID-19 but remains relatively stable

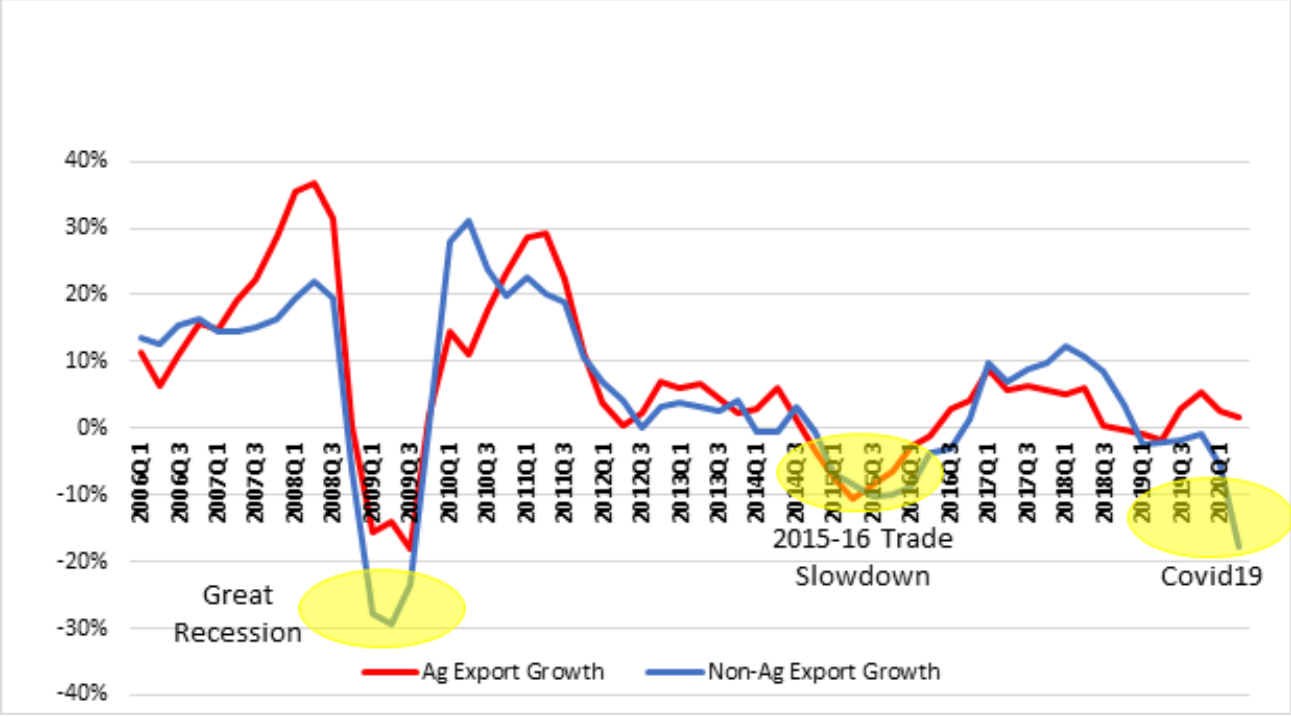
While U.S. agricultural exports during the first half of the year fell relative to the same period in 2019, the decline was not extreme by historic standards, nor in comparison with the steep fall in non-agricultural exports. Following the emergence of COVID-19, agricultural export growth began to slow in first quarter of 2020 with a growth rate of less than 1% relative to the same quarter in 2019 (see Figure 1). As U.S. outbreaks accelerated and lockdowns ensued, second

Fig 1: U.S. Exports Quarterly Growth (Change over same quarter, previous period)



Note: 2020Q3 includes July and Aug data only. Agricultural export growth reflects products included in USDA definition of agricultural goods. Data from Trade Data Monitor.

Fig 2: Global Exports Quarterly Growth (Change from same quarter, previous year)



Notes: Agricultural export growth reflects products included in USDA definition of agricultural goods. Data is from Trade Data Monitor.

quarter agricultural export declined much further, falling 7%, relative to the second quarter of 2019. In comparison, U.S. non-agricultural exports plummeted 26% in the same quarter.

The smaller impact on agricultural trade may reflect the relatively lower income elasticity of food demand, particularly for staple food items, and the structure of the agricultural global value chains which is less fragmented than manufacturing and other merchandise trade. Additionally, agricultural trade, which occurs more substantially through bulk marine shipments, is likely to be less susceptible to disruption to transport restrictions in other sectors that require more human interaction (WTO, 2020c). Growth of global agricultural trade has been relatively more stable than growth in U.S. agricultural exports. Growth in quarterly global agricultural exports had been positive for both Q1 and Q2 with a change of +3% and +1%, respectively (see Figure 2).

Impacts on agricultural trade low compared to previous trade shocks

How does the COVID-19 disruption on agricultural trade compare with other major economic crises over the past two decades? Figures 1 and 2 highlight changes in quarterly export growth under COVID-19 relative to three other signifiant trade shocks: (i) the Great Recession (or Global Financial Crisis); (ii) the 2015-16 International Trade Slowdown; and (iii) the 2018-19 Retaliatory Tariffs.

The Great Recession

In 2008-09 the global economy suffered a deep recession resulting from the global financial crisis. Sudden drops in demand and supply, credit constraints, and disruptions to global value chains, led to one of the sharpest trade collapses ever recorded (Baldwin, 2009). At the peak of

this crisis, quarterly U.S agricultural exports plummeted over 21% and global agriculture exports fell 18%. The much larger reduction in trade that occurred in 2009 was quite stark, particularly when compared to the magnitude of the respective GDP shocks. U.S. quarterly GDP contracted 4% at the height of the Great Recession. In comparison, second quarter GDP in 2020 fell 31.4%, the steepest drop ever recorded, before recovering 33.1% in the third quarter. However, the subsequent drop in U.S. agriculture exports under COVID-19 was much more modest (Figure 1).

2015-16 Trade Slowdown

Beginning in 2015, commodity prices began to fall from their recent highs, the U.S. dollar appreciated, and the IMF and others lowered their forecasts for global economic growth. These macro factors led to a significant slowdown in global trade (UNCTAD, 2016), with U.S. and global agricultural exports falling more than 10%, a steeper contraction than currently observed under COVID-19 (Figure 1).

2018-19 Retaliatory Tariffs

Beginning in 2018, U.S. agriculture was impacted by unprecedented trade retaliation by China and other key trading partners. In total, over $30 billion of U.S. agricultural exports were subject to retaliatory tariffs imposed in 2018 (Grant et al. 2019). At the lowest point of the trade conflict, U.S. quarterly agricultural exports fell 10% (2018-Q4) (Figure 1), which has exceeded the decline in U.S. agricultural exports under the COVID-19 pandemic thus far.

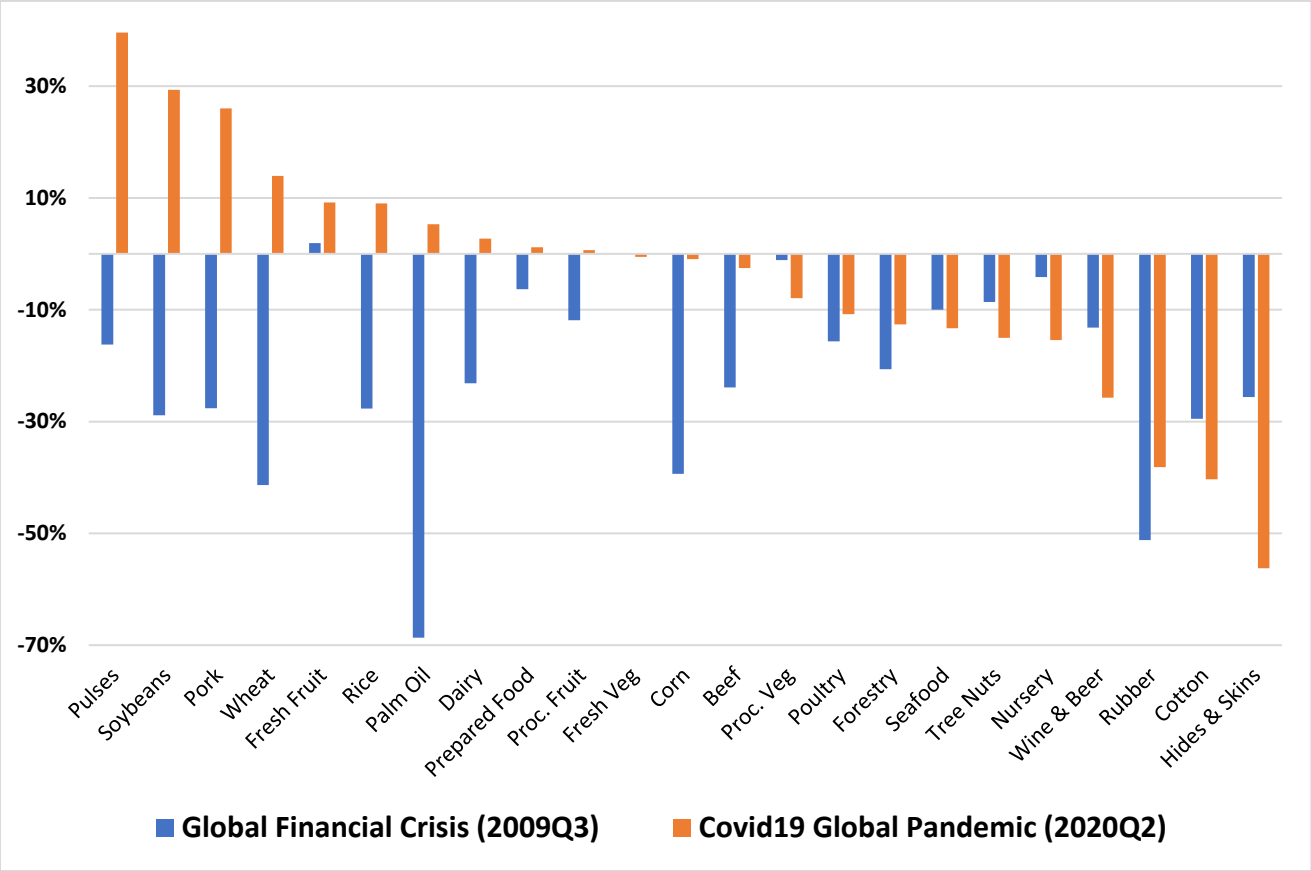
II. Sectoral and Regional Trade Impacts

Level of trade disruption is highly sectoral within agriculture

The impact of COVID-19 on agricultural trade across sectors has been uneven. The sectoral differences are noticeably sharp when one compares the sector-by-sector impacts to the 2008-09

Global Financial Crisis (Figure 3). Unlike the across-the-board declines observed during the Financial Crisis illustrated in Figure 3, there are clear differences across sectors owing to the unique nature in which COVID-19 has disrupted demand and supply chains.

Fig 3: Quarterly Change in Global Agricultural Trade following the Great Recession and Covid19 pandemic



Notes: Selected agricultural & related sectors. Quarterly trade changes are from the same quarter in the previous year: 2019Q2 for Covid19, and 2008Q3 for the Financial Crisis. Data from Trade Data Monitor.

First, non-food agricultural trade has declined significantly more than food products. In particular, hides & skins, cotton, rubber, nursery are among the sectors hardest hit by the COVID-19 pandemic. These sectors are more likely to have a higher income elasticity of demand. Further, they are more susceptible to the demand laden shocks of COVID-19 lockdowns. For instance, world retail sales of clothing and textiles plummeted under the weight

of closures of apparel stores, weaker demand for purchases due to stay at home orders, and lower incomes as unemployment increased or workers became furloughed. Second, there is a clear dichotomy between food products more likely to be consumed at home versus those being consumed away from home. For example, trade in sectors characterized by high restaurant or food away from home consumption, such as seafood, poultry, and beef products (Binkley and Liu, 2019), have declined globally. In comparison, trade in staple cereal and protein crops, which are more likely to be consumed at home or serve as intermediate inputs for processing, has increased. Third, the role of workers falling ill in meat packaging plants and plant closures in the United States, Brazil and other major meat exporting countries may also weigh on exports due to temporary supply disruptions; however external from COVID-19 shock, international trade in pork has been stimulated heavily by the outbreak of African Swine Fever (ASF), which has increased demand from China and other outbreak countries.

Regional impact is heterogeneous

Figure 4 presents a sector by country matrix of the changes in 2020 2nd quarter trade experienced under COVID-19. The changes in trade across sectors are sorted left to right from sectors experiencing the highest positive global trade growth (pulses) to those sectors hit with the sharpest decline (hides and skins). Similarly, changes across countries are sorted from countries experiencing the highest overall positive growth (Brazil) under COVID-19 to those suffering the overall steepest contraction (Mozambique). Positive growth is indicated in green and negative growth in red.

Fig 4: Change in exports under Covid19, change in 2nd Quarter 2020 exporters relative to previous quarter

Exporter	Pulses	Soybean	Pork	Wheat	Fresh Fruit	Rice	Palm Oil	Dairy	Prep Food	Proc Fruit	Fresh Veg	Corn	Beef	Proc Veg	Poultry	Forestry	Seafood	Tree nuts	Nursery	Wine & Beef	Rubber	Cotton	Hides & Skins
Brazil	14%	48%	45%		-20%	171%	51%	16%	-1%	-9%	180%	-87%	30%	15%	-21%	-9%	-6%	-5%	12%	-28%	-35%	-12%	
Russia	-12%	46%	173%	30%	-35%	-73%	9%	10%	1%	50%	41%	54%	65%	13%	92%	-10%	-12%	72%	-50%	-16%			-97%
Kenya	374%				27%		95%	-57%	34%	74%	-6%		-14%	17%		-34%	-51%	-46%	-30%	-53%	10%		
Turkey	94%	624%			23%	44%		-14%	17%	5%	8%	69%	-18%	-1%	-15%	-12%	-13%	18%	-13%	-26%		-3%	
Argentina	109%	62%	258%	-35%	9%	6%		28%	1%	-64%	37%	16%	-4%	-44%	-23%	-4%	10%	-42%		-14%	-93%	-63%	8%
Mexico	16%		36%	226%	10%	63%	-11%	7%	15%	-6%	2%	66%	42%	10%	60%	-2%	-21%	-17%	-17%	-29%		-31%	
Japan			29%		7%	9%		26%	27%	-2%	171%		-20%	-5%	27%	-4%	-16%	-1%	13%	-38%			14%
Thailand	11%		112%		57%	0%	-75%	29%	6%	0%	-20%	15%		-4%	1%	-13%	6%	-48%	-53%	-55%	-41%		21%
Indonesia					88%		9%	34%	32%	16%	-26%			43%		-2%	5%	7%	0%	-25%	-41%		
Canada	60%	-6%	14%	11%	-37%	25%		17%	-4%	7%	22%	-49%	-5%	-15%	0%	-16%	-23%	-6%	-8%	-15%	-71%		-69%
China	11%	-25%	-13%		52%	-15%	31%	-40%	9%	-3%	5%	-97%	-34%	-7%	-17%	-5%	-15%	8%	-3%	-28%	-8%	-70%	-34%
Colombia					-16%		27%	50%	23%	-18%	-21%		49%	-25%		-46%	-4%		-16%		-58%		-66%
South Africa	48%		-41%	187%	16%	14%	-19%	-19%	-15%	5%	-26%	193%	61%	-24%	-32%	-49%	-26%	16%	-42%	-51%		-44%	-33%
Switzerland			40%			19%		-6%	-3%	-15%	0%		-12%	2%	-50%	0%	-76%	-37%	-7%	-44%			-37%
Ukraine	-15%	-69%	5%	21%	-66%			-25%	10%	-3%	-36%	-24%	-14%	-8%	-16%	-13%	11%	-37%	-5%	-7%			-14%
New Zealand	33%		-50%		2%			4%	-13%	20%	-13%		-5%	1%	-61%	-31%	-33%		-24%	-5%			-15%
EU	4%	-65%	34%	55%	-9%	0%	-16%	8%	3%	0%	7%	-20%	-3%	-13%	-9%	-5%	-12%	-27%	-19%	-27%	-27%	-62%	-72%
Chile	0%		42%		-11%			13%	1%	9%	-4%		38%	-3%	-5%	-15%	-7%	-22%	-9%	-17%			-38%
USA	27%	-27%	11%	-9%	-1%	3%	-12%	12%	-6%	-7%	-15%	11%	-26%	-16%	-7%	-18%	-10%	-17%	-17%	-21%	-29%	-35%	-35%
Uruguay		-5%		63%	36%	132%		-4%	54%				-23%			-2%	-25%			-37%			48%
Singapore			111%		-15%	50%	11%	20%	-3%	-24%	78%		-18%	15%	53%	-63%	-26%	31%	-44%	-49%	-46%		-85%
Malaysia			-18%		-16%	-12%	1%	-28%	-18%	54%	1%		-42%	-17%	-27%	-39%	-6%	-4%	-51%	-56%	-39%	-89%	-93%
Hong Kong			49%		35%	-6%		-50%	51%	-46%	-54%		-65%	-33%	-3%	-38%	-46%	-69%		-28%	-85%		0%
Cote d'Ivoire					-10%	148%	-21%		15%					-40%		-23%	-9%	-16%			-10%	-73%	
Morocco					1%			-34%	-21%	-10%	-23%			-33%		-37%	-18%	47%	-24%	-55%			
Australia	26%		37%	3%	-2%	-47%		-12%	1%	-20%	-12%	5%	-5%	21%	17%	-29%	-20%	-38%	-41%	-11%		-76%	-36%
Taiwan			96%		-7%	216%		66%	-8%	-29%	-13%		-37%	5%		-24%	-30%	-6%	-23%	-33%			
Peru	-31%				1%	8%	-39%	-73%	-14%	-2%	-13%	3%		-5%		-58%	-53%	-25%	6%	-80%			
Senegal					-11%	-89%			15%		43%					-10%	-20%	-78%				-10%	
Mozambique	-60%	82%			5%		-29%									-91%	-18%	-15%				-85%	
Zambia								-34%	-36%			-29%			-13%	11%			-20%			-75%	-95%

Notes: Selected Agricultural & Related Sectors. Data from Trade Data Monitor.

Overall, the changes in trade under COVID-19 is highly variable across both markets and sectors. The matrix seems to suggest that the disruption caused by COVID-19 permeates relatively more across sectors rather than across countries. We can see this in the figure by the higher clustering of trade contractions (highlighted in red) being more concentrated on the right hand side of the table as opposed to the left side. Further, there does not appear to be a clear relationship between the regional variation in the severity of COVID-19 outbreaks relative to observed export changes. For instance, Brazil, which has been one of the countries hardest hit by the coronavirus, experienced the strongest export growth whereas Mozambique had fairly limited outbreaks despite experiencing the largest contraction. The patterns behind the variation across exporters is not clearly evident, but likely depends on the production composition in a given exporting country.

III. Quantitative assessment of the impact of COVID-19 on agricultural trade

The previous findings were based a simple change or "delta" of agricultural exports before and after the coronavirus pandemic. However, percentage changes cannot tell us whether the coronavirus pandemic has had a statistically significant impact on agricultural and non-agricultural trade, nor can it tell us the extent to which agricultural trade varies with changes in different pandemic-related indicators including cases, deaths, and resident mobility within countries. Further, percentage changes do not control for other potential confounding factors influencing agricultural trade such as exchange rate movements, income and GDP shocks, trade agreements (e.g., the U.S.-China Phase One trade deal), or pest and animal disease outbreaks (e.g., ASF or Fall armyworm).

Here, we conduct a straightforward *ex post econometric* evaluation of the impact of the COVID-19 pandemic on agricultural exports using a quarterly agricultural import model of total (i.e., not bilateral) agricultural and non-agricultural imports from the world market, using the latest data available. Specifically, because the COVID-19 pandemic has affected countries at different points in time, beginning in China, spreading to Europe, the United States, and eventually most other countries, we exploit variation in coronavirus case incidence rates per one hundred thousand individuals.

Specifically, we estimate the following model of total agricultural and non-agricultural imports:

$$(1) \qquad \Delta M^{S}_{jqt,t-1} = FE_j + \theta_1\left[\Delta COVID_{jqt,t-1}\right] + \varepsilon_{iqt}$$

where, ΔM_{iqt} is the change in the value of imports in quarter q and year t between $t = 2020$ to $t\text{-}1 = 2019$ by importer j in sector S (S = *agriculture or non-agriculture*), and FE_j are importer fixed effects (FE) capturing heterogeneity of country-specific import growth. Note, since the dependent variable is differenced across years, time-invariant unobserved effects specific to each importing country are removed. The main variable of interest is $\Delta COVID_{jqt}$ denoting the increase in the number of coronavirus cases or deaths reported in importing country j per 100,000 people. Since the COVID-19 pandemic started in 2020, these variables take on positive values in quarters one through three of 2020. The coefficient of interest is θ_1.

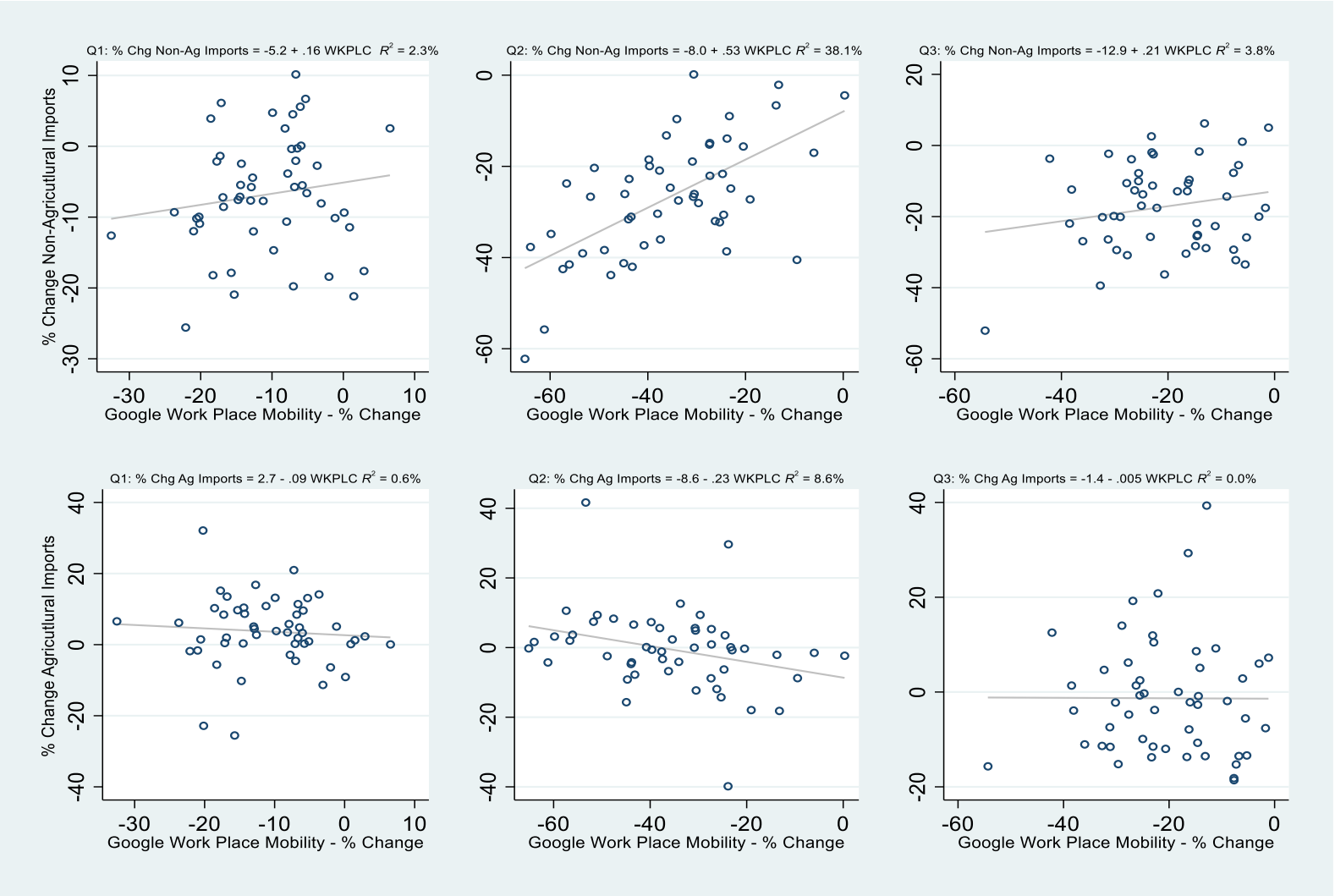
While COVID-19 cases and deaths measure the incidence and spread of coronavirus cases throughout a country, a more direct measure of the economic restrictions imposed by COVID-19 is the degree to which workplace mobility was halted during the pandemic. To explore this

association, we make use of Google Mobility data, which tracks the change in resident mobility trends associated with grocery and pharmacy, parks, transit stations, retail and recreation, places of residence, and places of work on a percentage change basis (Google LLC). Google maintains this data for over 130 countries worldwide (excluding China).

These data are measured in percentage changes relative to the median baseline value for the corresponding day of the week, during the 5-week period Jan 3–Feb 6, 2020. We aggregate the mobility data to the quarterly level to match the periodicity of the trade flow data. We then computed the percentage change in agricultural and non-agricultural imports for each country for quarters one through three in 2020 relative to the same quarter in 2019, so that both Google Mobility data and trade flows are expressed as percentage changes (i.e., ΔM_{iqt}, equation (1)).

Figure 5 provides a scatter plot of the relationship between the percentage change in the value of non-agricultural and agricultural imports relative to 2019 against Google's workplace mobility trends (also measured as a percentage change). Also plotted is the linear fit equation (i.e., line of best fit) of the scatterplot. A priori, if COVID-19 has disrupted trade through reduced workplace mobility, then we would expect to see a positive association between trade and mobility – that is – trade is increasing with increasing mobility. The scatterplots in Figure 5 indicate that the positive relationship between imports and mobility only holds for non-agricultural trade. The correlation between agricultural trade and workplace mobility, on the other hand, is weak and in some cases negative (quarter 2, Figure 5). It appears agriculture trade has, by and large, remained robust during the pandemic. For non-agricultural trade, the effect is particularly pronounced in quarter 2 of 2020 relative to the same quarter in 2019. Across all importing countries, we find

Fig 5: Quarterly Changes in Non-Agricultural and Agricultural Trade vs Lockdowns in 2020 (relative to same quarter of previous year)



Notes: Figure presents scatter plots of the percentage change in non-agricultural (Non-Ag) and agricultural (Ag) imports against percentage changes in Google's workplace mobility trend. A linear line of best fit is added and the equation Q1, Q2, and Q3 denote quarters one, two and three, respectively of 2020.

that non-agricultural imports are 5.3% lower, on average, for every 10% reduction in workplace mobility due to lockdowns imposed during the global pandemic. The R-squared implies that mobility explains 38.1% of the variation of non-agricultural trade changes in Q2, compared to just 8.6% for agricultural trade.

Estimated impact of COVID-19 on agricultural trade -4.2%; non-agricultural trade -18.7%

The econometric analysis attempts to isolate the impact of the pandemic on trade by controlling for other confounding factors using fixed effects. Table 2 presents the econometric results after estimation of equation (1) by agricultural and non-agriculture sector. Country-level fixed effects are included in all specifications but not reported. The first set of specifications show that the effect of COVID-19 on trade as captured by the number of confirmed case and death counts is significant but very small. Projecting the estimated coefficients in columns 1 and 3 on the mean levels of case and death counts for the second and third quarters of 2020, implies a quantitative effect of -2.7% and -2.4% reduction of agricultural trade, respectively. The implied impact is likely driven by commodity price changes, which have fallen significantly for many agricultural sectors under this period. The impacts of COVID-19 case and death counts on the value of non-agricultural trade are larger in magnitude at -4.3% and -3.6% (Columns 2 and 4, respectively).

The estimates based on COVID-19 incidence likely understate the impact on trade since they do not reflect the overarching economic repercussions of the pandemic. As explained earlier, the actual economic impact of COVID-19 may be better represented through its lockdown effect on the economy. Using Google retail and workplace mobility traffic as proxies for the economic and trade impacts of COVID-19, we find stronger impacts induced by the pandemic. Estimated

Table 2. Estimated effect of Covid19 on Agricultural and Non-Agricultural Trade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(7)	(8)
	Ag	**Non-Ag**	**Ag**	**Non-Ag**	**Ag**	**Non-Ag**	**Ag**	**Non-Ag**	**Ag**	**Non-Ag**
New Cases per 100k	-0.001**	-0.002***								
	(0.00)	(0.00)								
New Deaths per 100k			-0.035***	-0.054***					-0.025**	-0.023**
			(0.00)	(0.00)					(0.01)	(0.01)
Mobility-Retail					0.075	0.509***				
					(0.06)	(0.04)				
Mobility-Workplace							0.129*	0.641***	0.089	0.605***
							(0.07)	(0.05)	(0.07)	(0.05)
N	162	162	162	162	150	150	150	150	147	147
R^2	0.462	0.503	0.458	0.499	0.453	0.754	0.462	0.771	0.482	0.778
Covid19 effect on Trade for 2nd and 3rd quarter in 2020	**-2.7%**	**-4.3%**	**-2.4%**	**-3.6%**	**-2.5%**	**-16.8%**	**-2.5%**	**-17.1%**	**Mobility: -2.5% Deaths: -1.7%**	**Mobility: -17.1% Deaths:-1.6%**

Notes: Dependent variable is the percentage change in quarterly imports from the same quarter of the previous year. Agricultural sector defined by USDA definition. Data includes 2019Q1 to 2020Q3. 2020Q3 includes only July and August. Estimation includes country fixed effects (not reported) and standard errors are in parentheses and robust to clustering by country. * and ** denote statistical significance at the ten and five percent levels. Mobility indices are the percentage change in people traffic as reported by Google using a Jan-Feb 2020 baseline, averaged by quarter. Covid19 effect is calculated as the estimated coefficient of the case, death count, or mobility index projected at the mean level of the indicator for 2020Q2 and 2020Q3, averaged across importers.

coefficients are generally positive and statistically significantly —indicating that a decreased mobility is more strongly associated with reductions in imports. The impacts implied by the estimated coefficients on agricultural imports (columns 5 and 7) are similar in magnitude to the COVID-19 case and death counts—implying a 2.5% reduction of imports. However, we find much larger impacts of mobility on non-agricultural trade, with retail and workplace mobility reducing non-agricultural trade by 16.8% and 17.1%, respectively.

As a final note, columns 7 and 8 present the effect of workplace mobility on agricultural and non-agricultural imports while controlling for COVID-19 morbidity. Although the resulting impact of workplace mobility on non-agricultural trade is slightly lower, at 16%, the results underscore the importance of lockdowns and constrained mobility on international trade compared to incidences of COVID-19 deaths. The varying lower results across different proxies suggests COVID-19 involves complex channels in terms of its effects on trade. Despite this complexity, initial estimations suggest a more significant impact on non-agricultural trade; whereas for agricultural trade the evidence is less robust. The resulting aggregate impacts of both indicators on agricultural and non-agricultural trade are -4.2% and -18.7%.

Conclusion

COVID-19 is affecting global agricultural markets in sharp and unexpected ways. To date, we have observed a slowdown in agricultural trade, but to a much lower degree than non-agricultural trade. Further the changes in agricultural trade have been more moderate compared to the contraction experienced during the 2008-09 Great Recession and other recent global trade shocks. The level of disruption is very sectoral in nature—non-food trade products and food products more

intensely consumed away from home have slowed or contracted more significantly than food products consumed at home.

Using the latest data available, we provided an early econometric analysis of the impacts of the pandemic. Controlling for other factors, we estimated that COVID-19 may have reduced agricultural trade by 4.2% in the second and third quarters of 2020. In contrast we found non-agricultural trade was reduced by 18.7%. This finding provides further support that agricultural trade has been, at least up until now, relatively steady amidst the global pandemic. Nevertheless, as the pandemic is still ongoing, the full extent of COVID-19 impacts on agricultural trade remain to be seen. While agricultural trade has been holding up in aggregate, the level of disruptions across sectors and markets are highly uneven. Further, given that COVID-19 effects on agricultural markets are not uniform, future research will attempt to unpack the multidimensional and heterogeneous nature of this significant trade shock.

For Further Information

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