

Economics and Commodity Futures Price Effects from Tariffs and Trade Wars

The Effects of Political and Economic Risks on Hedging and Hedging Strategies
On events from April 2018

AEM4210 January 2020

Why do We Care about 'Trade Wars'?

- In this course we deal with a class of financial securities.... Futures contracts and options..... That are used to hedge market risks.
- We generally view randomness in prices as a random walk with prices rising from moment to moment in a seemingly independent way
- From time to time the markets go nuts.... They rise or fall precipitously for no obvious reasons.... These are rare - 'Black Swan' -events
- In 2018 as the USA entered a trade war with just about everybody the markets responded as economics dictated they should.
- Because the source is known, 2018-2019 presented perhaps the best case study of a rare 'Black Swan' event in decades
- 'commodities' are the purest form of economic price discovery driven strictly by the forces of supply and demand

President Trump Announces Tariffs on Steel and Aluminum, March 1 2018



- March 1st, 2018 President Trump makes surprise announcement on tariffs on steel and aluminum
 - To punish China for unfair trade practices and dumping
 - Included Canada despite free-trade
 - To bolster and increase manufacturing of steel and aluminum in USA
 - USA consumption of domestic production, \$7 Billion
 - USA exports of domestic production, \$12 Billion
 - USA imports \$20 Billion
- April 4 2018, China announces retaliatory tariffs, including tariffs on soybeans
 - Joining many other countries, including Canada, in retaliation

The Presidential Tweets circa March 2018

 **Donald J. Trump** 
@realDonaldTrump

When a country (USA) is losing many billions of dollars on trade with virtually every country it does business with, trade wars are good, and easy to win. Example, when we are down \$100 billion with a certain country and they get cute, don't trade anymore-we win big. It's easy!

5:50 AM · 02 Mar 18

 **Donald J. Trump** 
@realDonaldTrump



We must protect our country and our workers. Our steel industry is in bad shape. IF YOU DON'T HAVE STEEL, YOU DON'T HAVE A COUNTRY!

8:01 AM · 02 Mar 18

 **Donald J. Trump** 
@realDonaldTrump



When a country Taxes our products coming in at, say, 50%, and we Tax the same product coming into our country at ZERO, not fair or smart. We will soon be starting RECIPROCAL TAXES so that we will charge the same thing as they charge us. \$800 Billion Trade Deficit-have no choice!

8:57 AM · 02 Mar 18

 **Donald J. Trump** 
@realDonaldTrump

The United States has an \$800 Billion Dollar Yearly Trade Deficit because of our "very stupid" trade deals and policies. Our jobs and wealth are being given to other countries that have taken advantage of us for years. They laugh at what fools our leaders have been. No more!

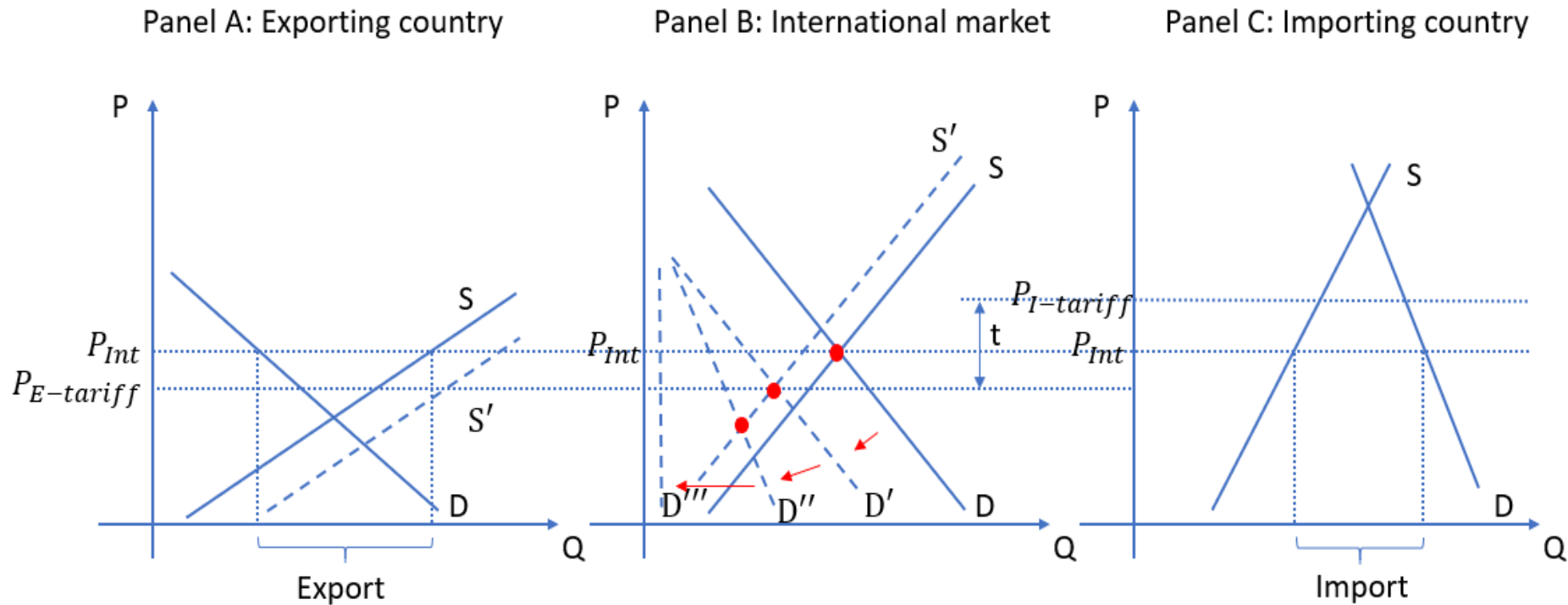
12:43 PM · 03 Mar 18

 **Donald J. Trump** 
@realDonaldTrump

If the E.U. wants to further increase their already massive tariffs and barriers on U.S. companies doing business there, we will simply apply a Tax on their Cars which freely pour into the U.S. They make it impossible for our cars (and more) to sell there. Big trade imbalance!

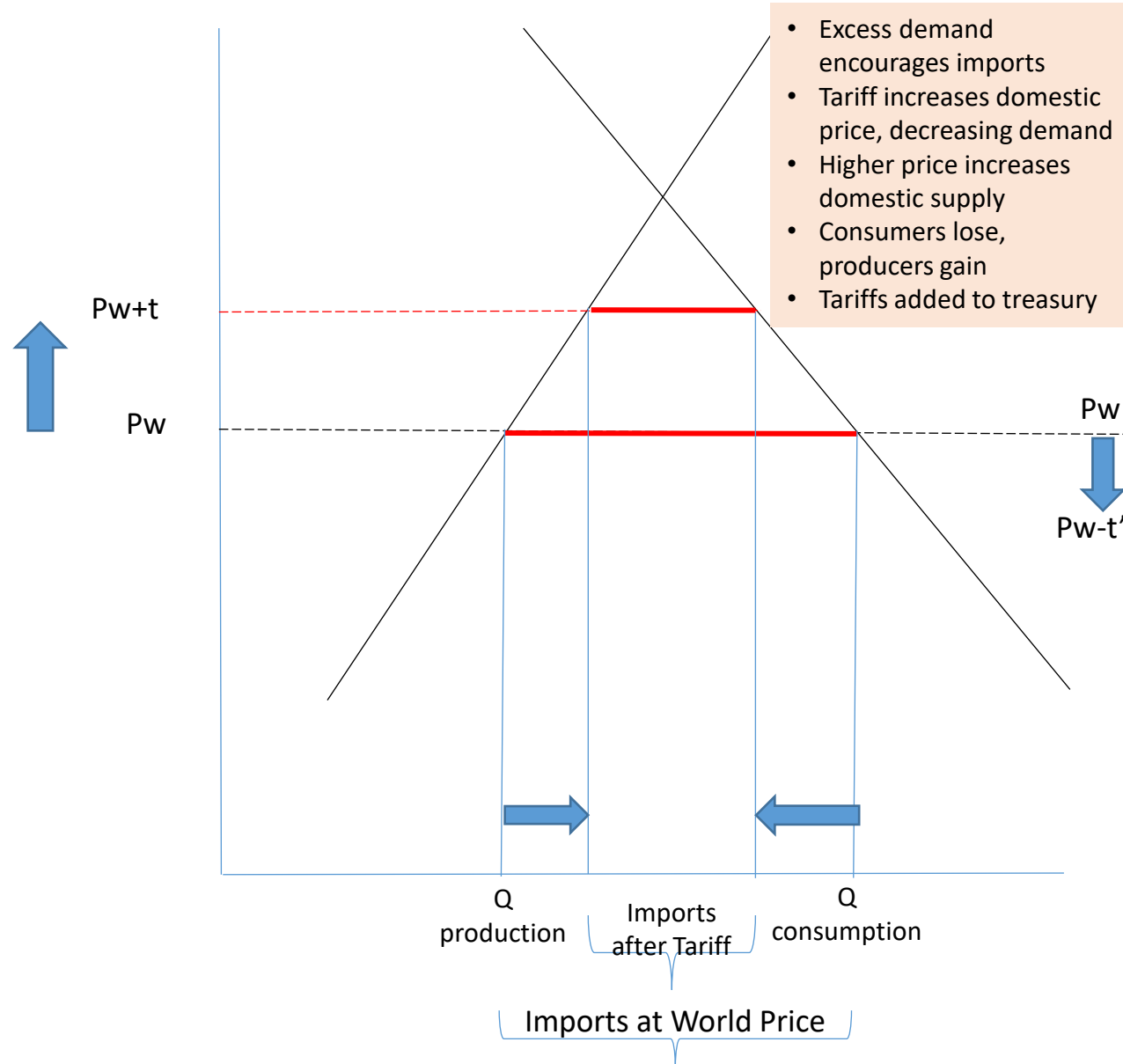
12:53 PM · 03 Mar 18

BACKGROUND---TRADE WAR CONSEQUENCES and the EFFECTS OF EMBARGO

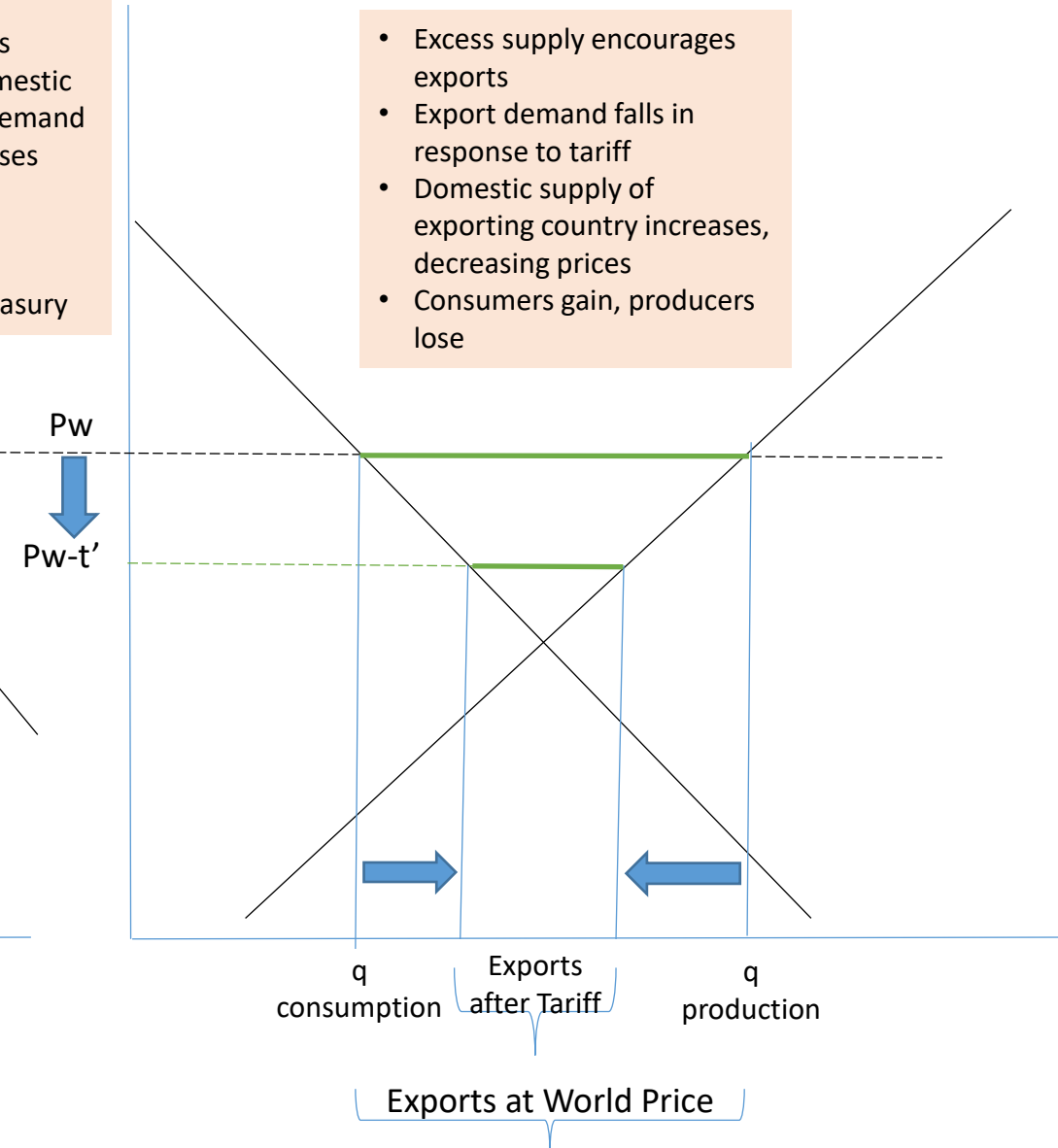


China responds to USA tariffs on steel and aluminum by imposing tariffs on USA soybeans imported by China. But retaliation was more than simply tariffs! China reduced imports and for several months embargoed USA Soybeans, 40% of which are normally exported to China.

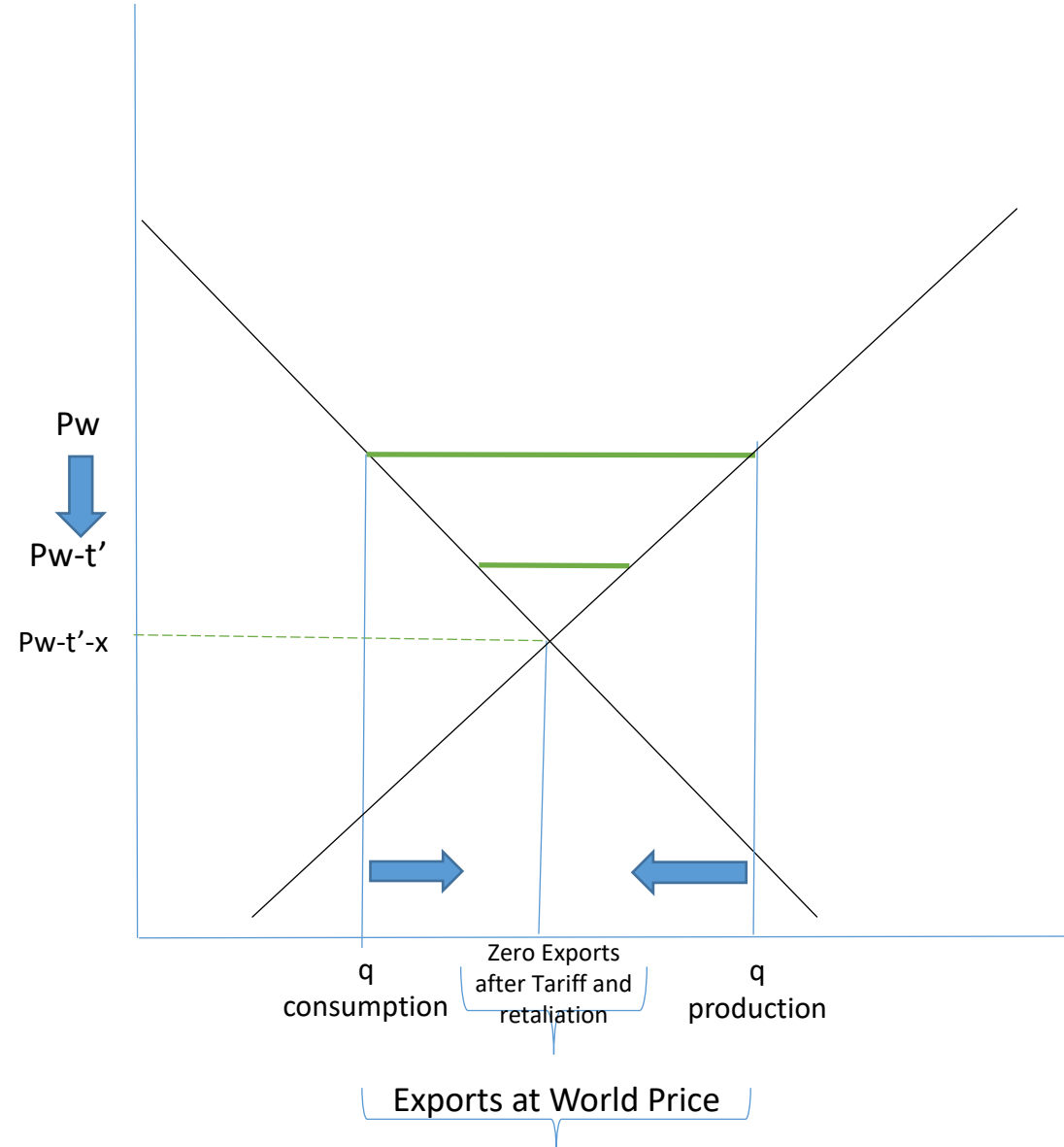
Importing Country (USA steel & China soybeans)



Exporting Country (USA soybeans & China steel)



- Excess supply encourages exports
- Export demand falls in response to tariff
- Domestic supply of exporting country increases, decreasing prices
- When the importing country not only throws tariffs but then retaliate by stopping imports all together as China did, the exporting country price reduces even further.
- Now storage comes in to play!
 - In the very short run commodity set for export now must be stored
 - Storage has limited capacity
 - As storage capacity falls, the cost of storage rises
 - But cost of storage must not exceed the possible price gains between now and future date.
 - As capacity is exhausted, commodity must be sold in the cash market, decreasing spot prices
 - For soybeans, as prices fall below cost of production losses mount, creating financial stresses



USA Imposes Tariffs: July 2018 Aluminum Futures



Remember:
The effect of a tariff imposed on a commodity or good (aluminum) from an exporting country (e.g. China, Canada, EU) by an importing country (USA) is to increase the price in the importing country

Contagion Effects

CME Futures, Mini Industrials March 2018



- Market responds to
- 1) Lower demand
 - 2) Higher prices
 - 3) Loss in producer profits and surplus
 - 4) Loss in consumer surplus
 - 5) Deadweight loss

At end of May, 2018 China Retaliates with Tariffs and order cancelations in Soybeans

CBOT:ZSH2019, 1D 907'6 ▲ +13'2 (+1.48%) O:895'4 H:912'0 L:894'2 C:907'6

Remember:
The effect of tariffs by the importing country (China) is to reduce the price of commodity or good (soybeans) in the exporting country (USA)





A closer look at soybeans

Market efficiency and market signaling



April 4 2018, China announces 25% tariffs on US goods including soybeans

China tariffs on U.S. soybeans could cost Iowa farmers up to \$624 million

Donnelle Eller, Des Moines Register Published 3:30 p.m. CT June 15, 2018 | Updated 8:56 p.m. CT June 18, 2018

Harvesting in a trade war: U.S. crops rot as storage costs soar

Mark Weinraub, P.J. Huffstutter

6 MIN READ



(Reuters) - U.S. farmers finishing their harvests are facing a big problem - where to put the mountain of grain they cannot sell to Chinese buyers.



China takes aim at America's soybean farmers

🕒 Apr 5, 2018

American soybean farmers are worried about their best customer. China was the United States' largest buyer last year, gobbling up \$12.3 billion worth of soybeans, according to the Department of Agriculture. But China is planning to make US farmers pay a 25% tariff to sell

China wants to stop buying American soybeans entirely

🕒 Oct 24, 2018

First, Beijing slapped tariffs on American soybeans. Now, it wants to wean its farmers off them altogether. China has been facing a potential soybean shortage after it put a new 25% tariff on importing them from the United States in July, part of the escalating trade war between the two countries. China is the world's biggest buyer of soybeans, using them as a

US soybean farmers say China tariffs could result in 'serious damage'

🕒 Jul 7, 2018

Soybean farmers, apple growers and auto workers are among the US workers bracing for fallout from a trade war between the United States and China. The US on Friday slapped tariffs on \$34 billion worth of Chinese imports to combat what it says are the country's unfair trade practices. Beijing called it the beginning of "the biggest trade war in economic history"

Source: CNN

The residual effect

BUSINESS NEWS JANUARY 30, 2020 / 4:15 PM / UPDATED 13 HOURS AGO

U.S. farm bankruptcies hit an eight-year high: court data

P.J. Huffstutter

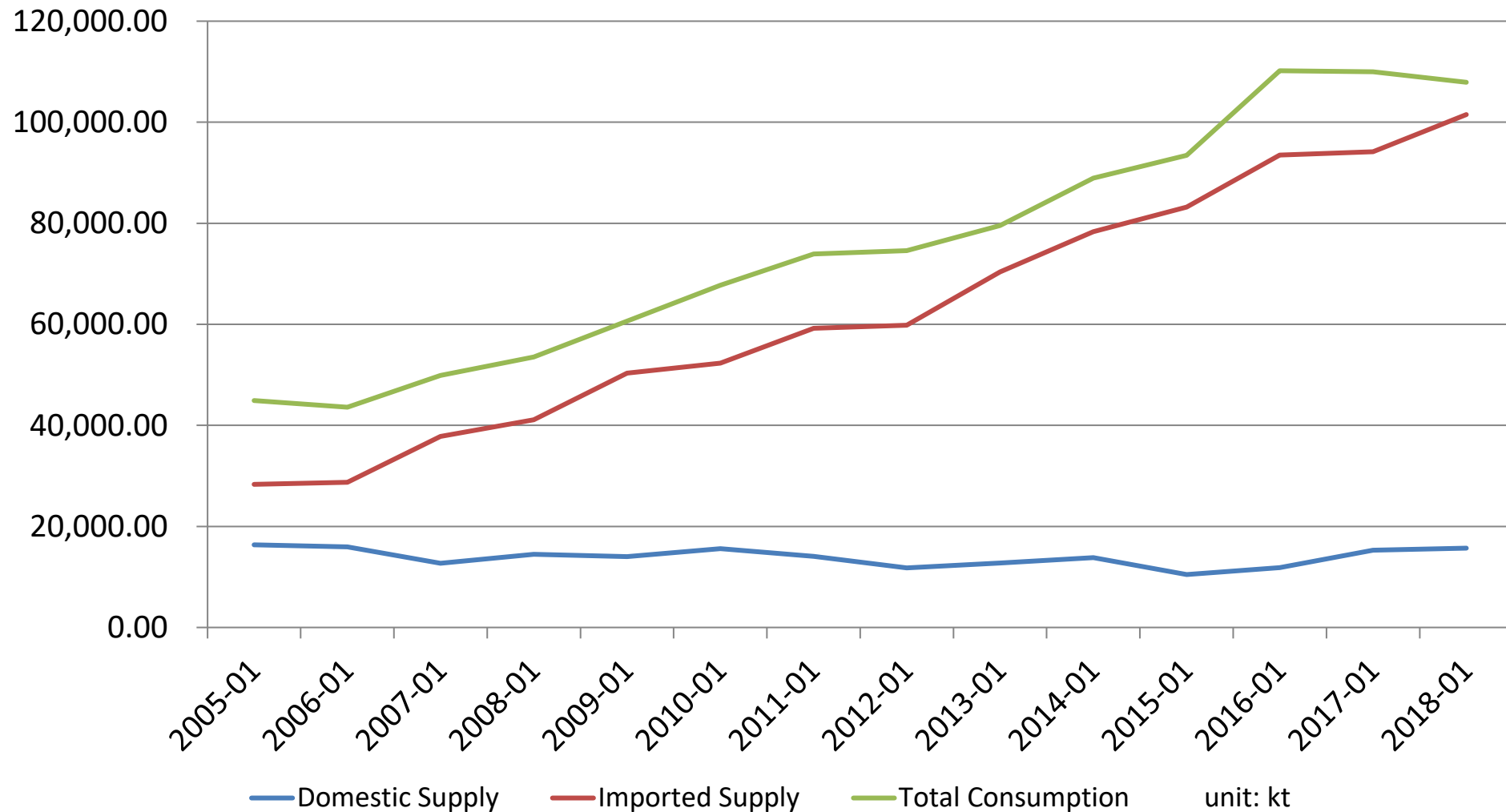
3 MIN READ



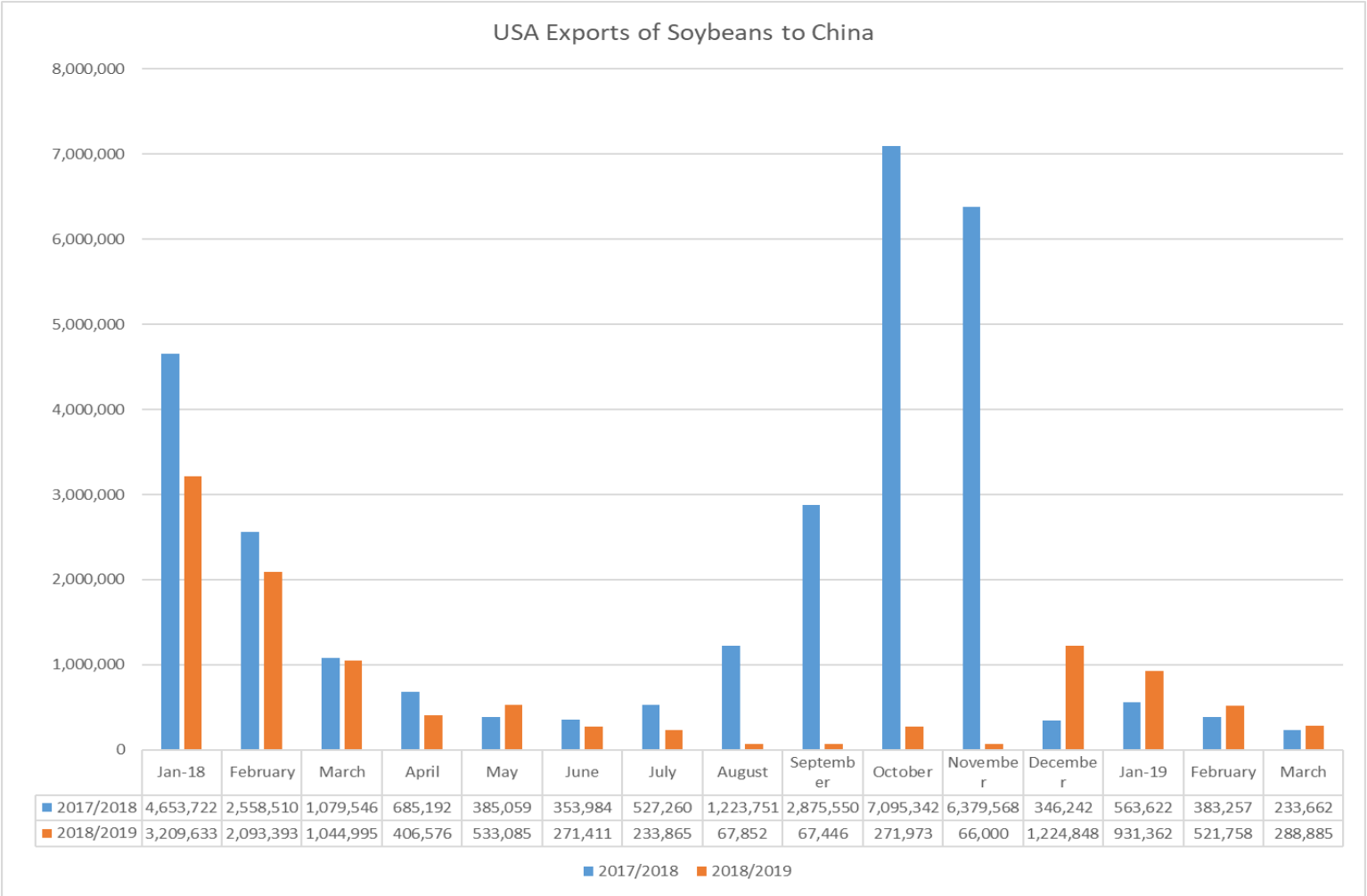
CHICAGO (Reuters) - U.S. farm bankruptcy rates jumped 20% in 2019 - to an eight-year high - as financial woes in the U.S. agricultural economy continued in spite of massive federal bail-out funding, according to federal court data.



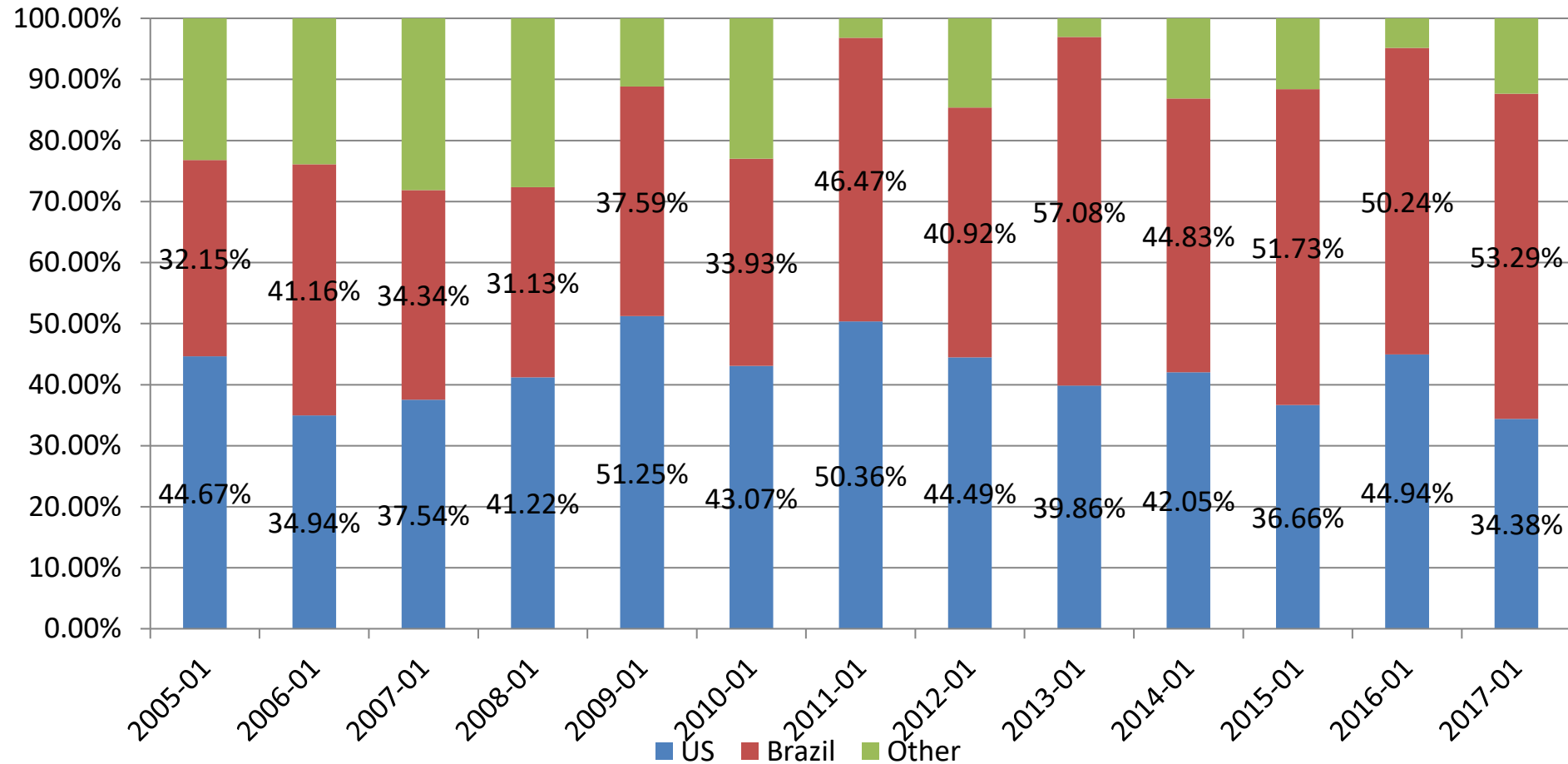
BACKGROUND---CHINESE SOYBEAN MARKET



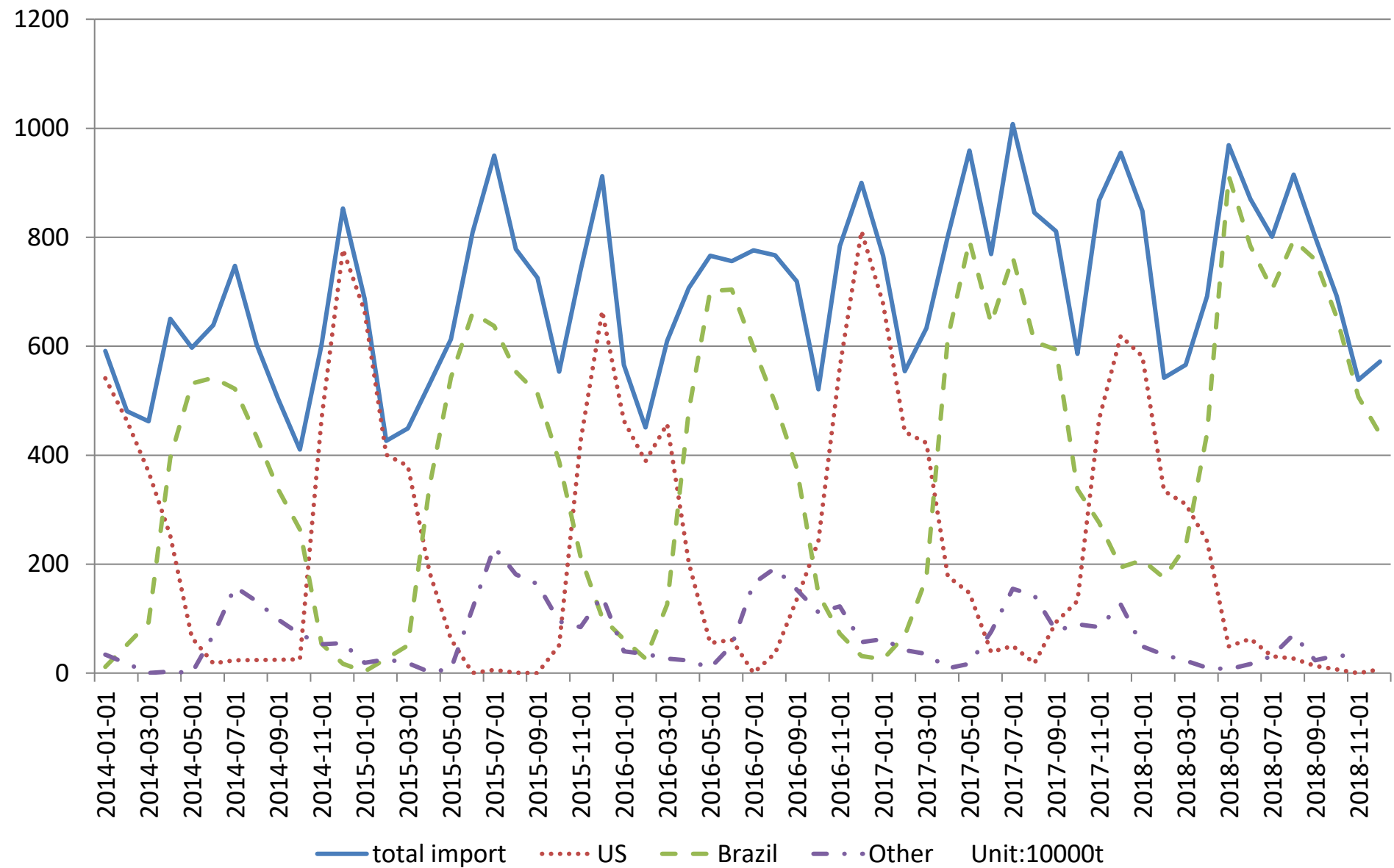
Monthly Exports USA Soybeans to China 2018-19 (current/previous year)



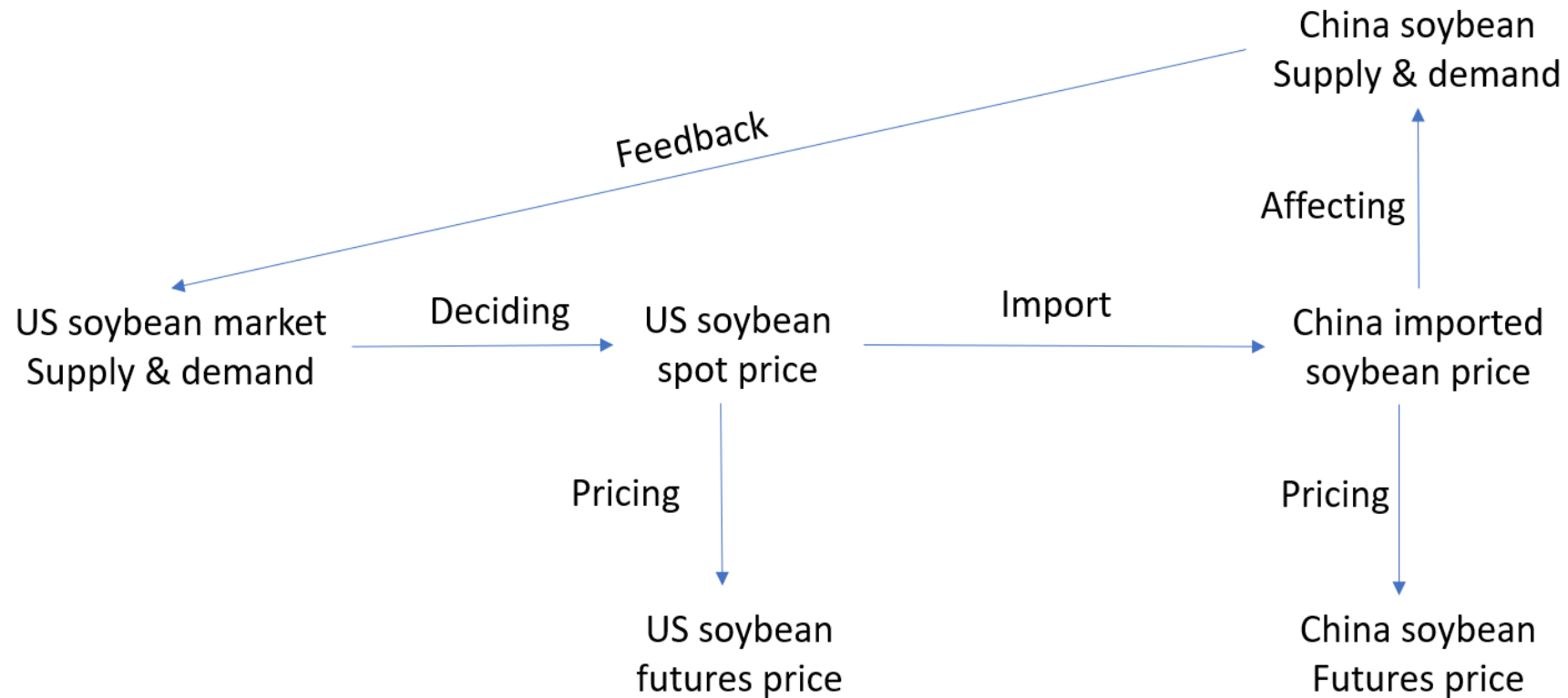
BACKGROUND---CHINESE SOYBEAN MARKET and IMPORTS



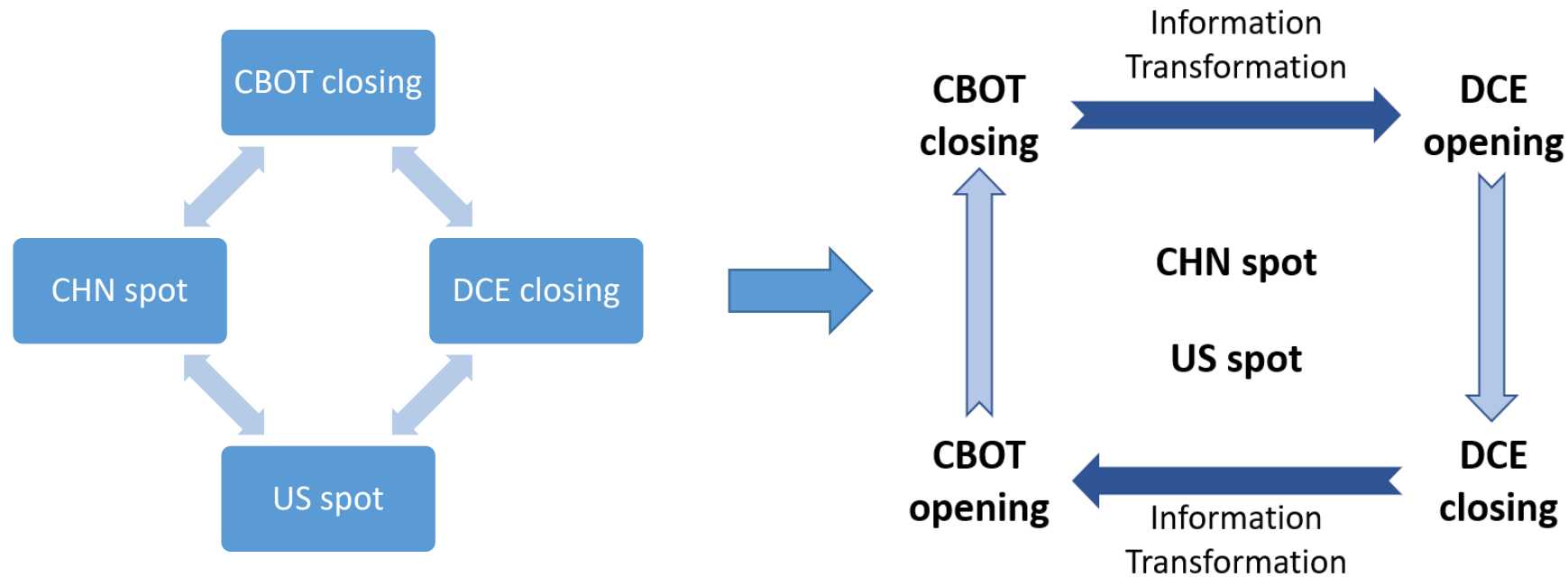
Countercyclical (harvest) Relationship between Chinese Soybean Market and US/Brazilian Imports



BACKGROUND---US-CHINA TRADING RELATIONSHIP and SOYBEAN MARKET INTEGRATED

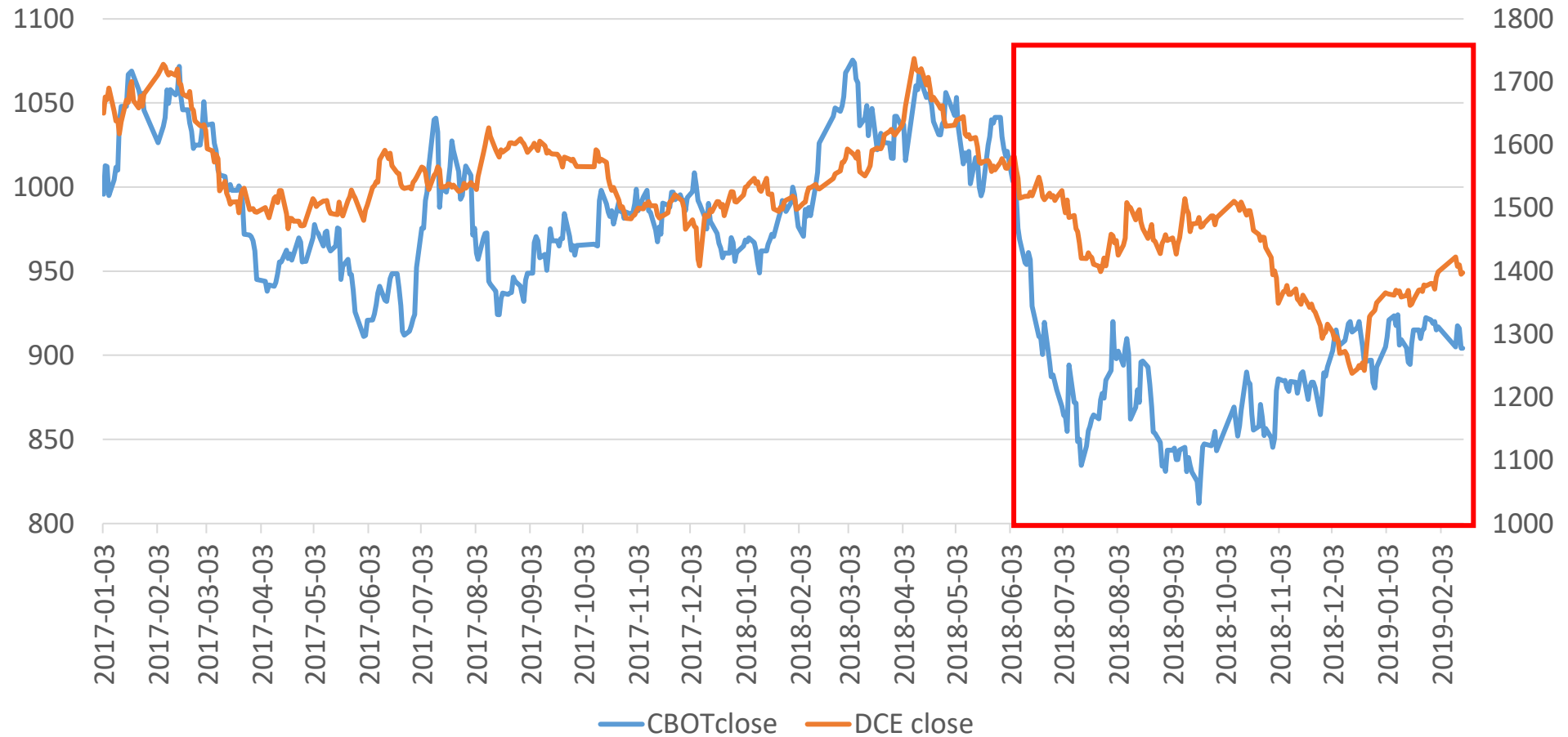


Trading Connectivity Between CME (Chicago) and Dalian Futures Exchange (China)



CME close 4:00PM is 3:00AM in China
Dalian open 9:30AM is 10:30PM Chicago
Dalian open following Chicago close
Chicago open follows Dalian close
One market SIGNALS the other

Contemporaneous CME and Dalian Futures Prices (USD)





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$$P_c \leq P_{usa} + T_d + T_o + T^B.$$

Tariff \rightarrow Free on board
(FOB)

$$\text{Tariff price} = \text{FOB} (1 + \text{tariff})$$

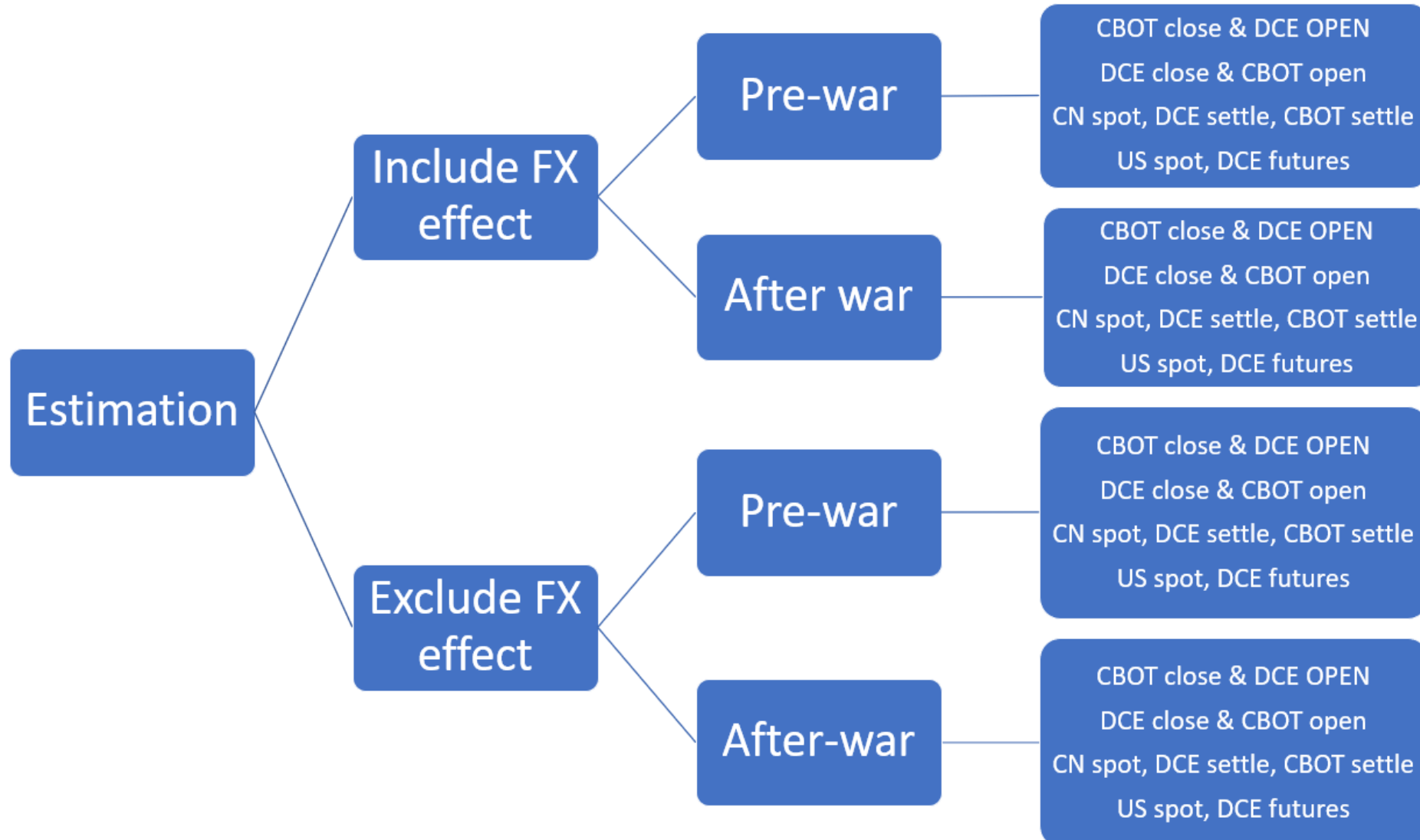
What does this say about market efficiency and the information flow (signaling) between USA and Chinese Markets?

- From a 'scientific' point of view the events of 2018 to present provide a rare 'natural experiment' to examine information flows and market signaling in international markets for soybeans
 - Chicago futures to Dalian futures
 - Chicago futures to China spot price (Eastern ports)
 - Dalian futures to Chicago futures
 - Dalian futures to USA spot price (Kansas)
 - China spot and USA spot
- Work done by MS student Xiaoxi Zhang (May 2019)
 - Estimation: Vector Autoregressive Model (VAR)
 - Model Validation Test
 - Serial Correlation: Lagrange Multiplier Test
 - Model Stability: Eigenvalue Test
 - Causality Test: Granger Causality Test

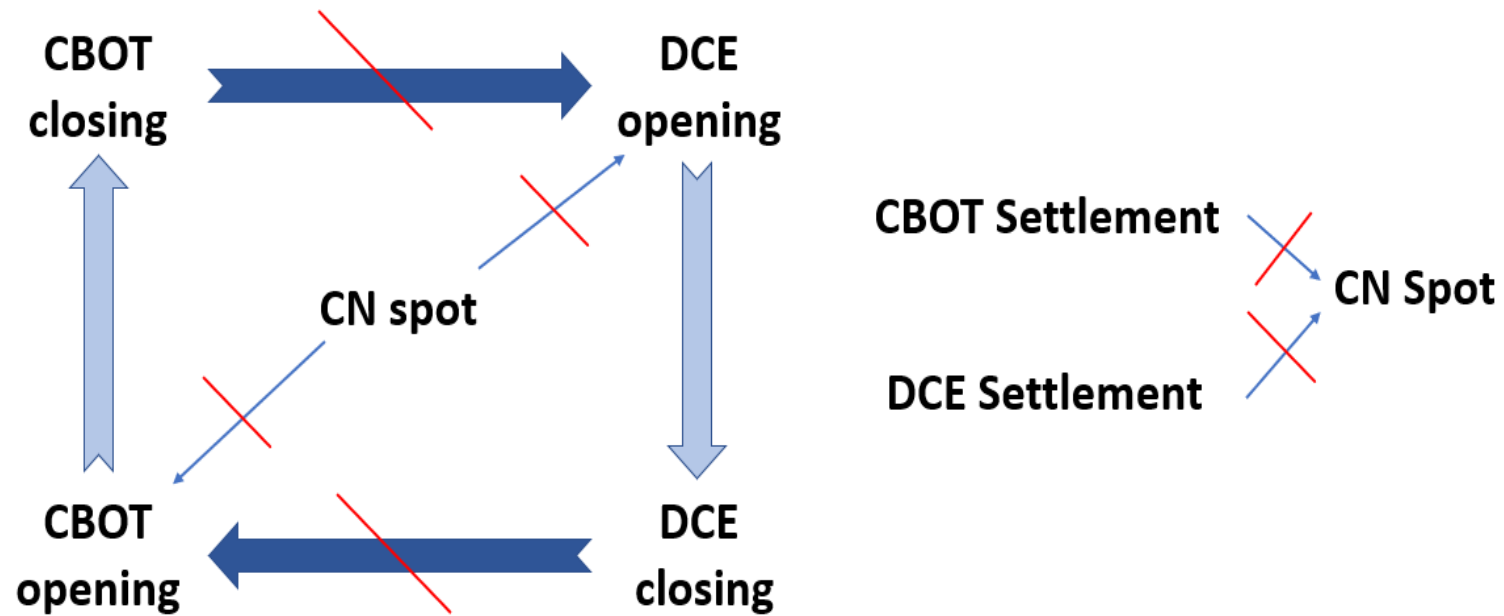
DATA

- Source: WIND, Bloomberg
- Time series
 - Prior to trade war: 4th, January 2016 — 16th June, 2018
 - After trade war: 16th June, 2018 — 14th, February 2019
- Exchange
 - China: Dalian Commodity Exchange (DCE)
 - US: Chicago Board of Trade (CBOT)
- Price: opening, closing, settlement, spot
- Soybean futures contract
 - Chinese #1 soybean futures
 - US soybean futures

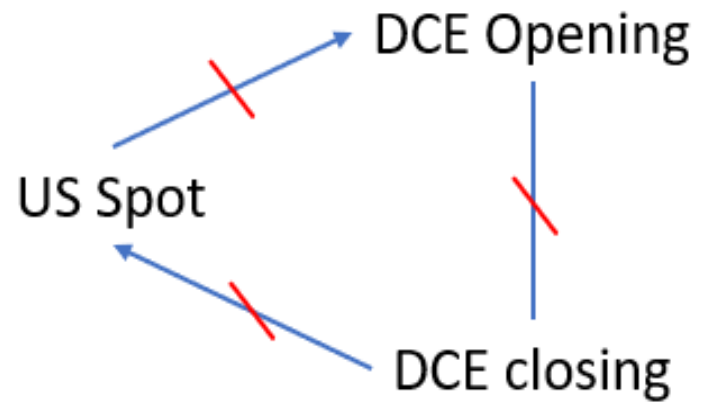
ESTIMATION PAIRS



RESULTS---After trade war



RESULTS---After trade war



Key Takeaways

- Verifies the previously existed price signaling effect between Chinese and US soybean markets, both spot and futures, and further proves that the relationship was broken because of the 2018 Sino-America trade war.
- China's retaliatory tariffs and embargo on US soybeans has not only decimated soybean farmers (\$11-16 Billion / Year) but has altered the pricing function of global futures markets with signaling moving from futures to spot prices.
- All estimations pass the serial correlation test and the stability test, the model is set appropriately.
- The results are robust when adding exchange rate effect.
- The results are also robust when switching spot prices. For Chinese spot price of soybean, estimations are repeated using spot prices reported by different trading ports (Qingdao, Shanghai, Nantong); for US spot prices, estimations are repeated using prices reported by three main producing areas (KS, IL, IA).

Key Takeaways

- Trade, prices and tariffs matter and should be considered in hedging strategies
 - Everything boils down to fundamental value
- Tariffs under GATT can be employed as a retaliatory measure to unfair trade practices
 - E.g. China (which is not a top 10 exporter to USA)
 - Trump and Navarro seem to be looking at full-on protectionism rather than retaliatory and may not carve-out exemptions for, e.g. Canada/Europe
 - Europe/Canadian threats of retaliation are legal under GATT (European tariffs are only 3%) – Motorcycles, bourbon, jeans... Trump threatens to retaliate against the retaliation which increases volatility further.
- Not exactly zero sum, but deadweight loss has to come from somewhere, and that is from losses in other markets. Longs benefit from gains in protectionism, shorts benefit from losses in producer and consumer surplus.
- Whether markets as inelastic as Sec Ross suggests remains to be seen