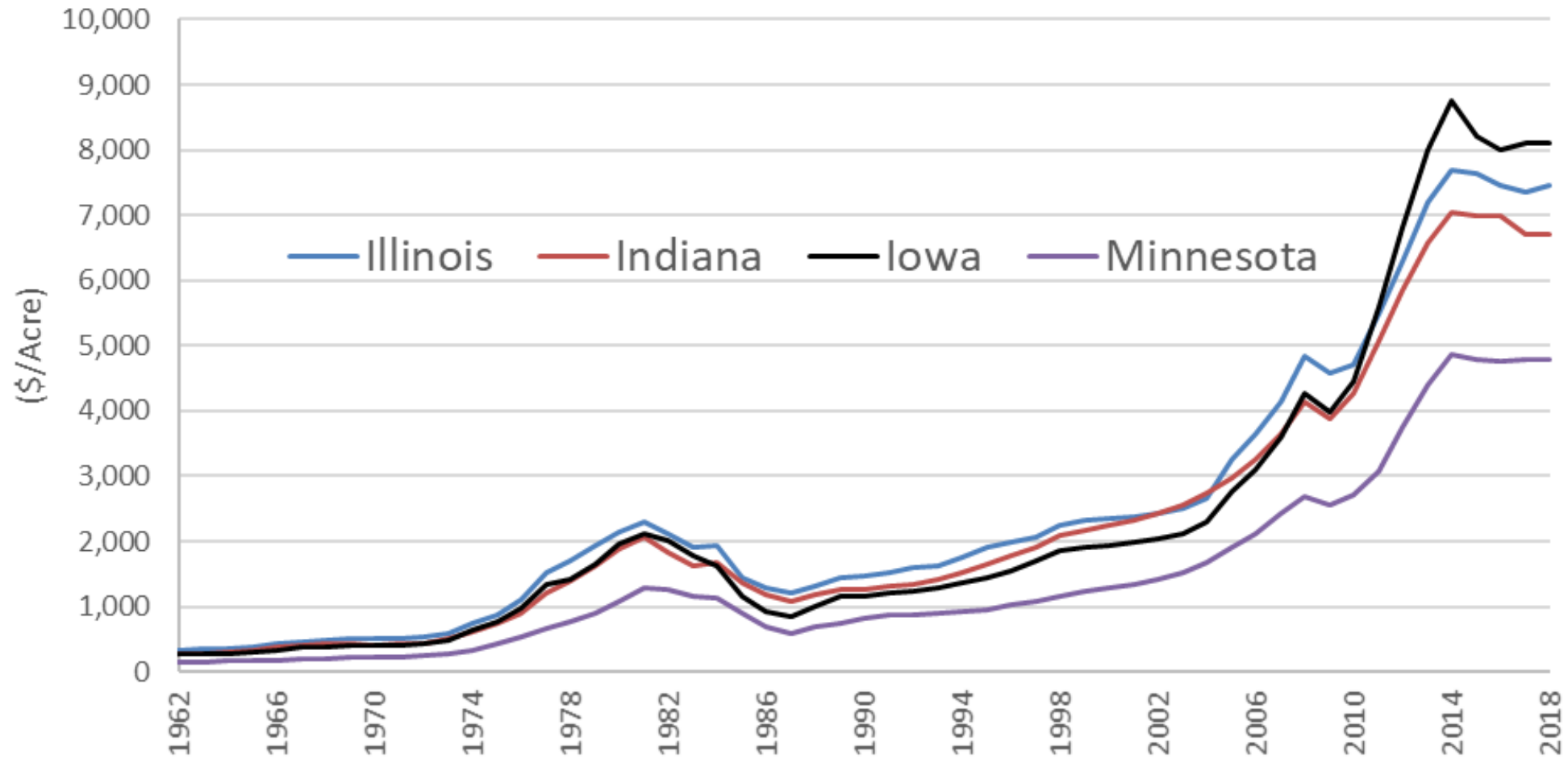

Farmland Markets: Headwinds, Tailwinds, and Long Term Prospects

Todd H. Kuethe
Bruce J. Sherrick

Outline

- **Recent farmland market trends**
- **Headwinds**
 - **Declining farm incomes**
 - **Increasing interest rates**
 - **Uncertainties (policy, tariffs, inflation, regulation)**
- **Tailwinds**
 - **Global demand for agricultural commodities**
 - **Thin markets**
 - **Crop insurance**
 - **Changes in production agriculture**

Midwest Farmland Price History



Farmland Prices – relating income, growth and discount rate

How much could I pay for farmland if....

		Discount Rate = i						
		3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%
E(R) (\$/ac/year)	150	7,500	6,000	5,000	4,286	3,750	3,333	3,000
	175	8,750	7,000	5,833	5,000	4,375	3,889	3,500
	200	10,000	8,000	6,667	5,714	5,000	4,444	4,000
	225	11,250	9,000	7,500	6,429	5,625	5,000	4,500
	250	12,500	10,000	8,333	7,143	6,250	5,556	5,000
	275	13,750	11,000	9,167	7,857	6,875	6,111	5,500
	300	15,000	12,000	10,000	8,571	7,500	6,667	6,000
	325	16,250	13,000	10,833	9,286	8,125	7,222	6,500
	350	17,500	14,000	11,667	10,000	8,750	7,778	7,000
	375	18,750	15,000	12,500	10,714	9,375	8,333	7,500
	400	20,000	16,000	13,333	11,429	10,000	8,889	8,000

It is common to relate Expected income (E(R)), Cost of capital (i) And growth rate for future income (g) to determine a price using

$$Price = \frac{E(R)}{(i - g)}$$

1% = g or growth rate of income

Price Pressure

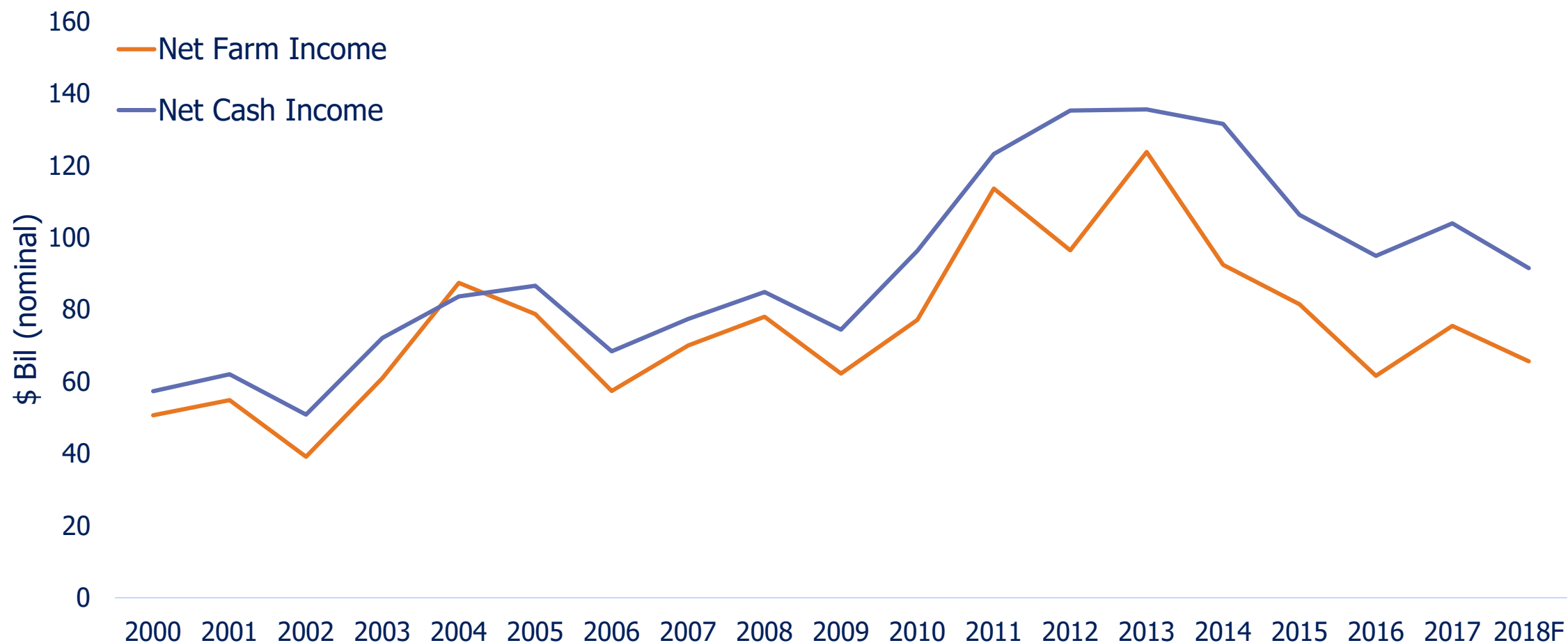
The costs of growing corn have risen more sharply than the sale price, cutting into profits.



Note: 2017 and 2018 costs are projections. The price of corn is for the most-active futures contract.

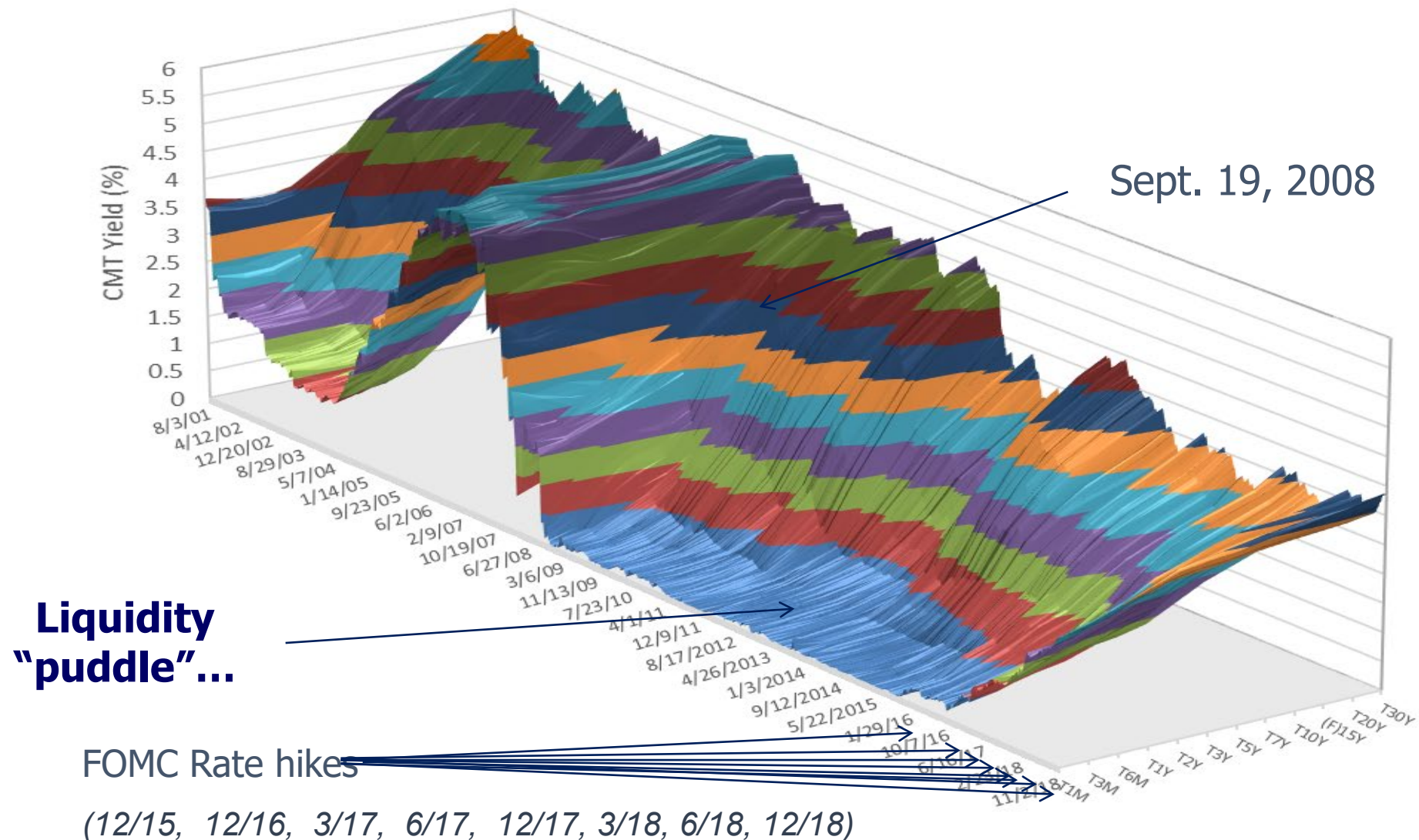
Sources: U.S. Department of Agriculture (costs); FactSet (corn price)

Headwinds: Declining Farm Incomes (US)

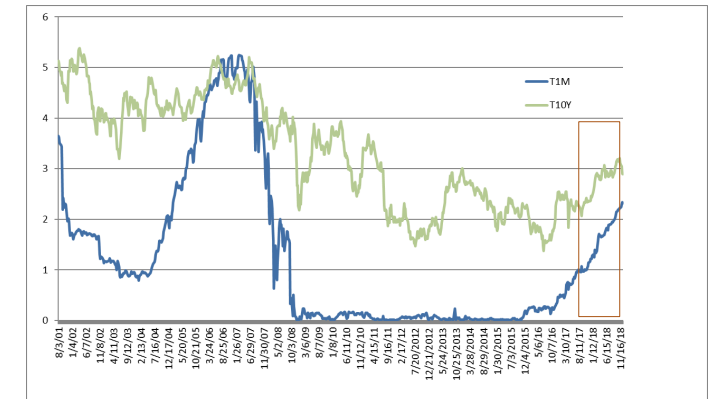
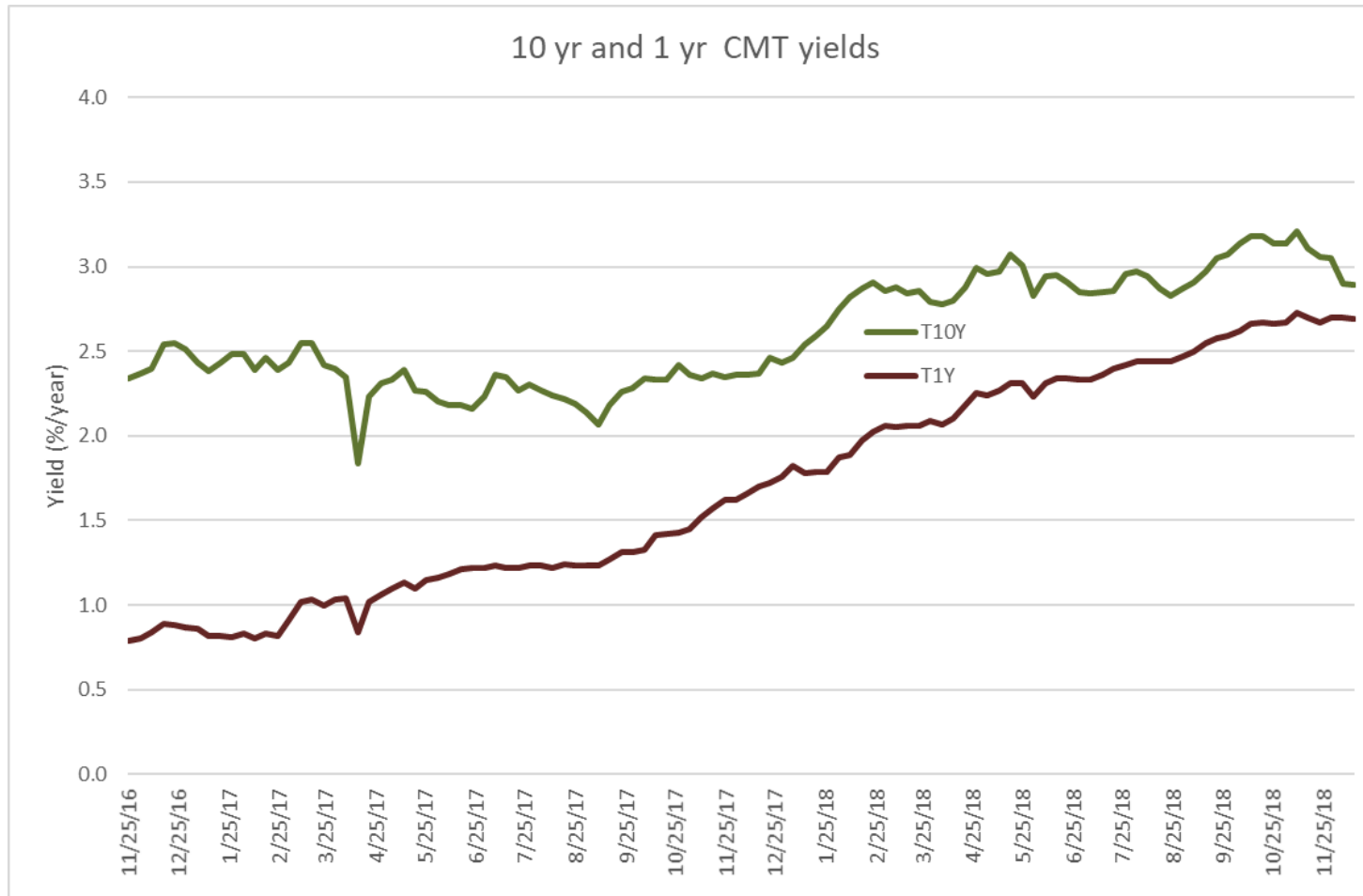


Source: USDA Economic Research Service

Yield Curve August 2001-Dec.18, 2018 (weekly)

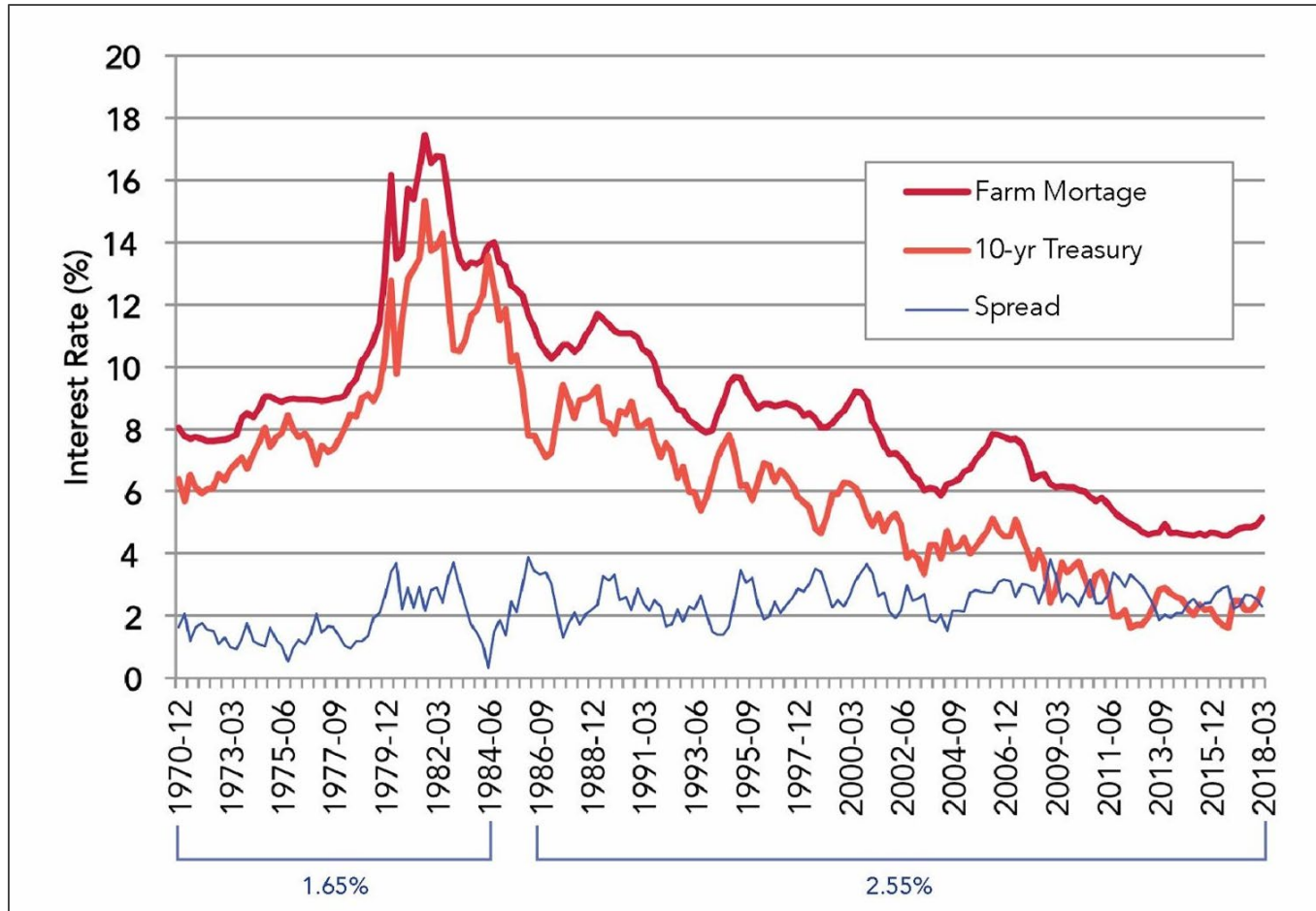


Term Compression – Flatter Yield Curve and Normalization



- Flattening yield curve
- 10 yr around 3%
- Very low term premium
- Fed appetite to stall equity markets seems low
- Movement concentrated in short rate and compression
- Inflation key relative to “real” productivity growth

Farm mortgage interest rates and funding relationships



1980s farm mortgages:

- 80% LTV
- 40-year amortization

Present mortgage environment:

- Lower interest rates
- Lower leverage
- Crop insurance / risk management
- Different lending environment
- Beginning-stage financialization
- Lending to non-owners
- Lending to funds

Headwinds: Uncertainty

- **Major sources of uncertainty in farmland markets**
 - Tariffs, trade, reliability of counterparties
 - Farm policy and evolution from commodity programs
 - Changes in consumer demand for food and agricultural products (attribute demand, sustainability, etc.)

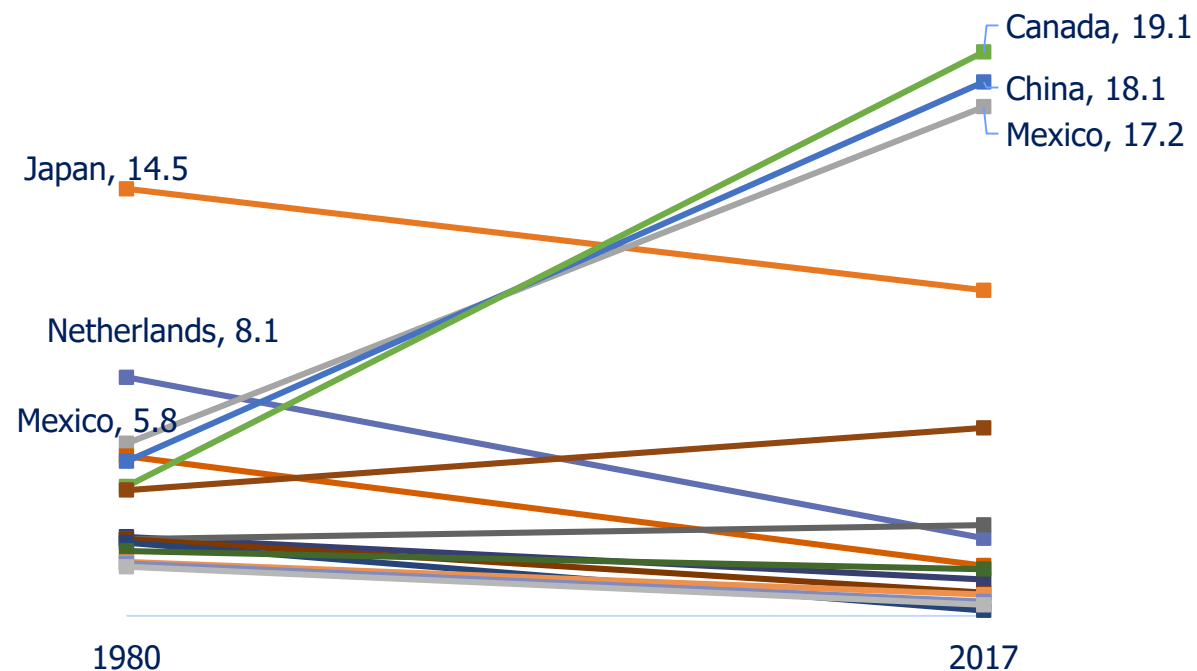
Agricultural Trade is a Small Part of Overall U.S. Trade, but opposite balance of trade compared to **All Other Trade...**



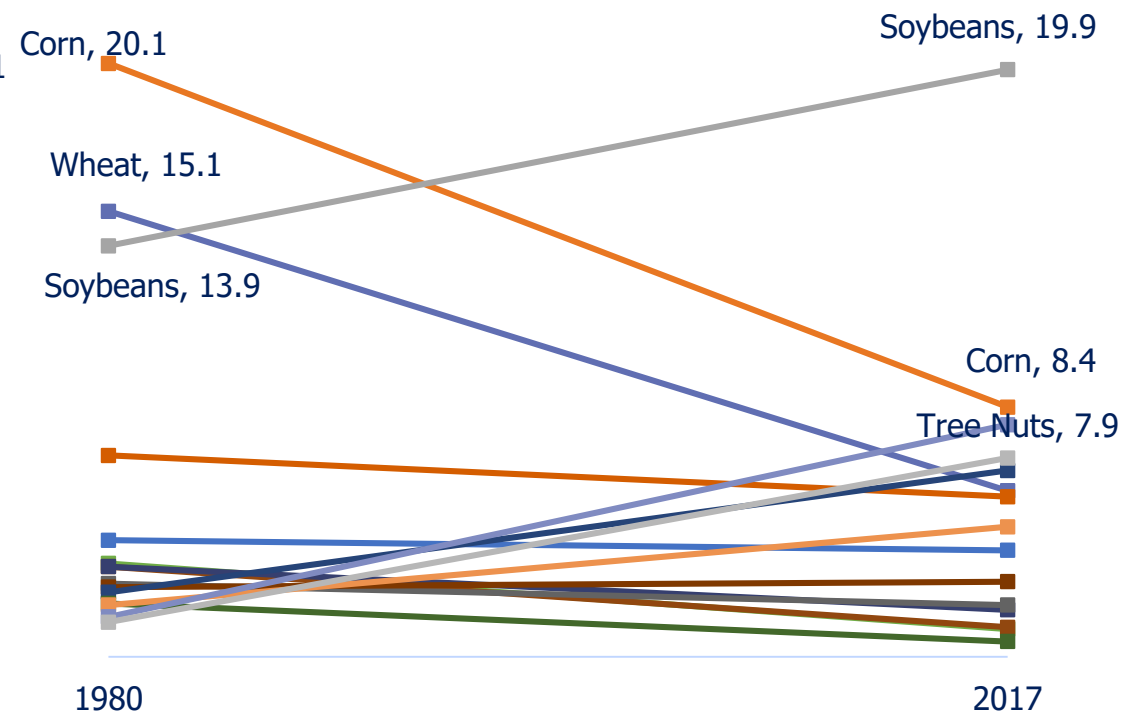
Source: St. Louis Federal Reserve FRED export/import data; USDA, Foreign Agricultural Service GATS ag export/import data – prepared by Jackson Takach.

The “Who” and the “What” of Ag Exports has changed dramatically

Top Ag Export Destinations
Then and Now

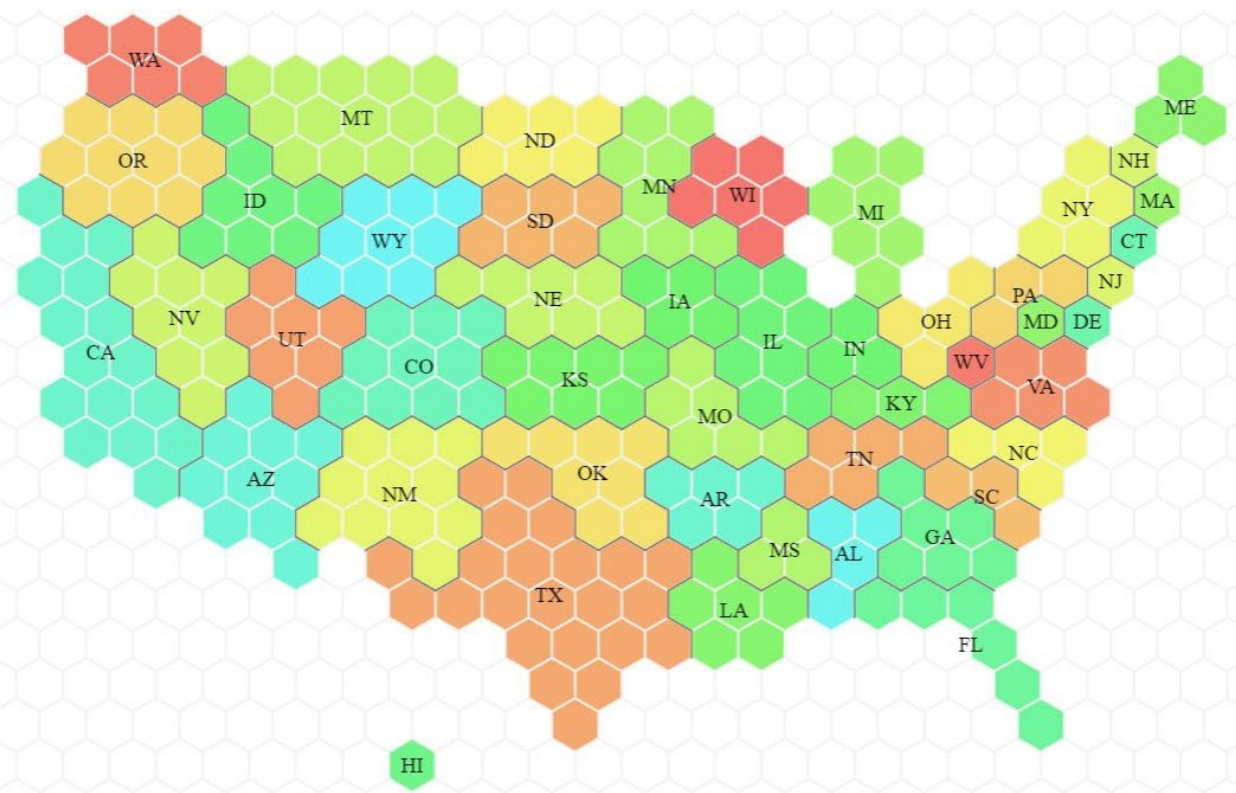


Top Ag Export Commodities
Then and Now

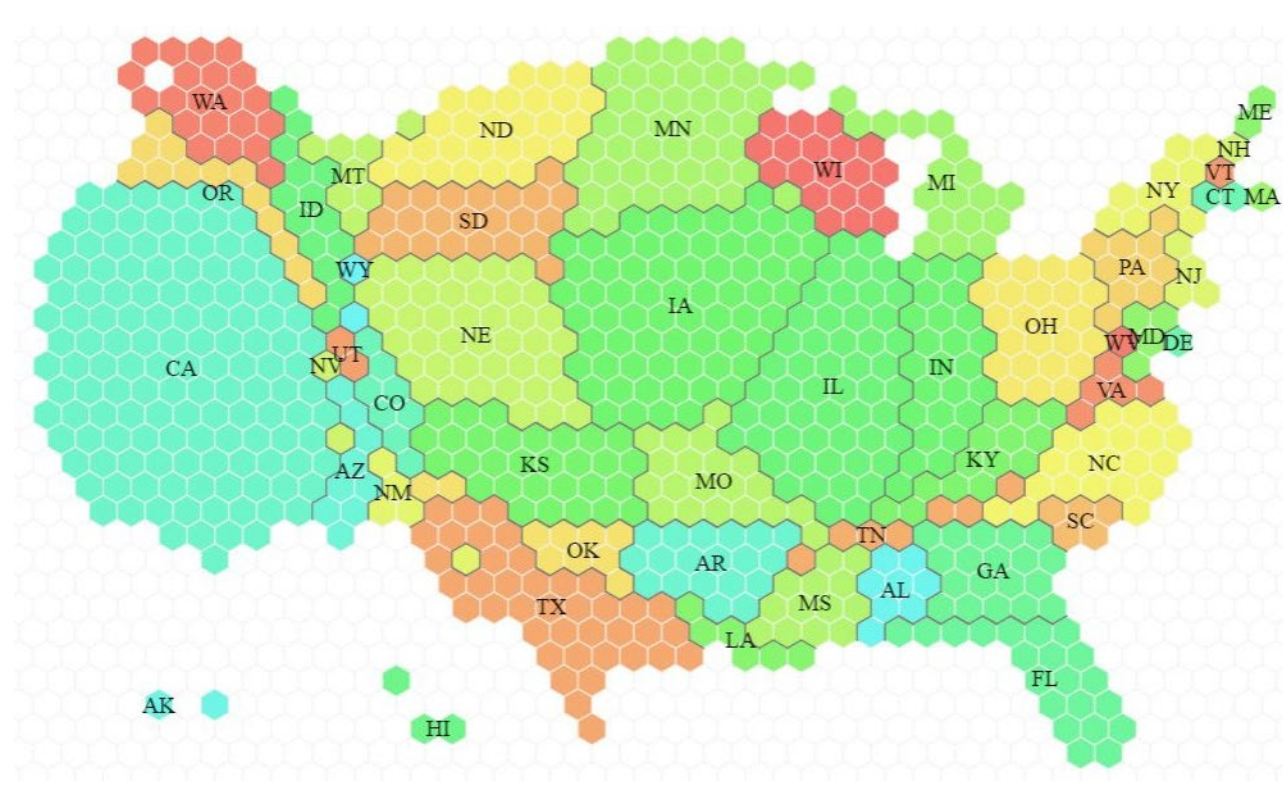


Agricultural exports are more important in some states than others

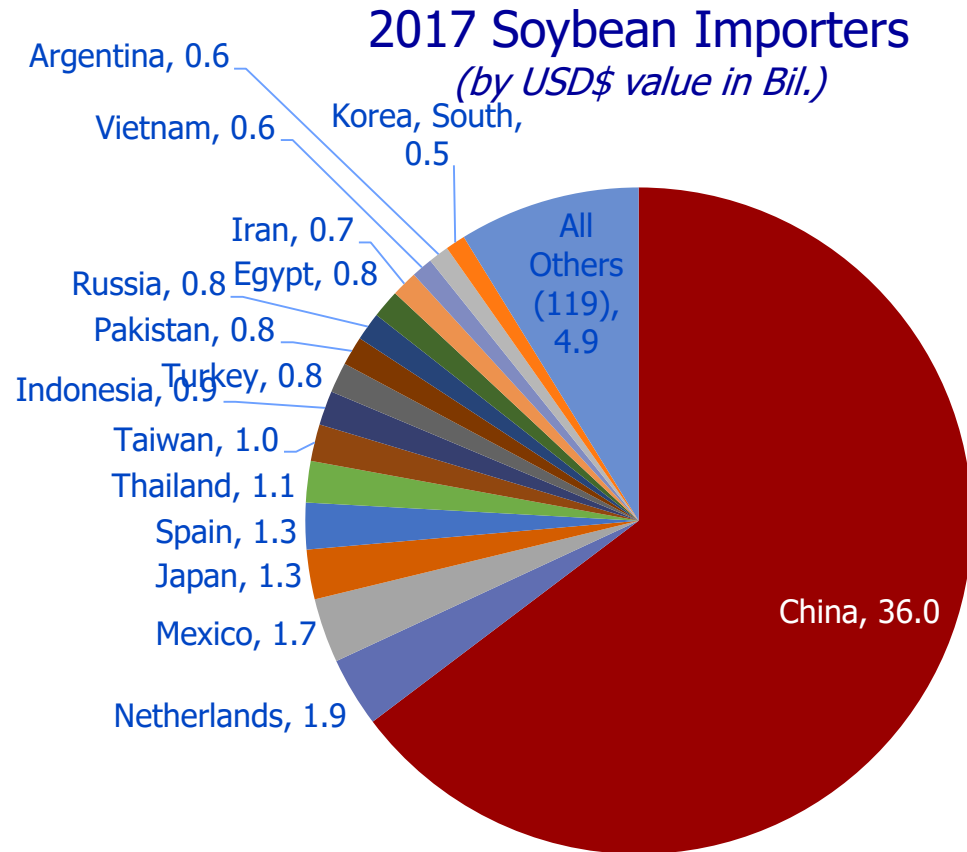
US Hex Sizes by Square Miles



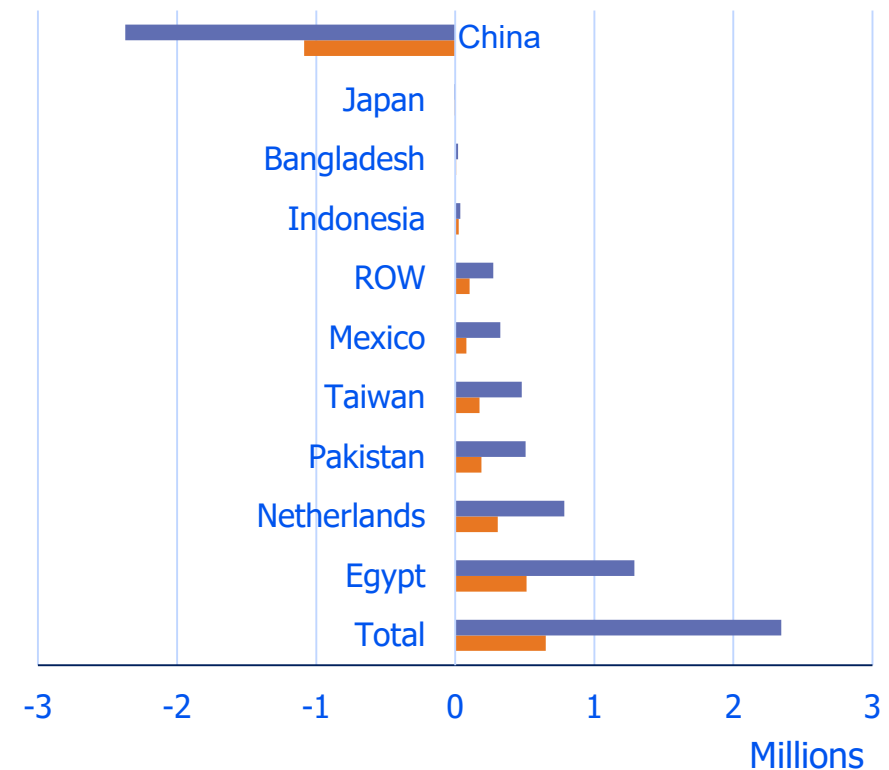
US Hex Sizes by Agricultural Exports



Soybeans may have some new homes, but difficult to replace China

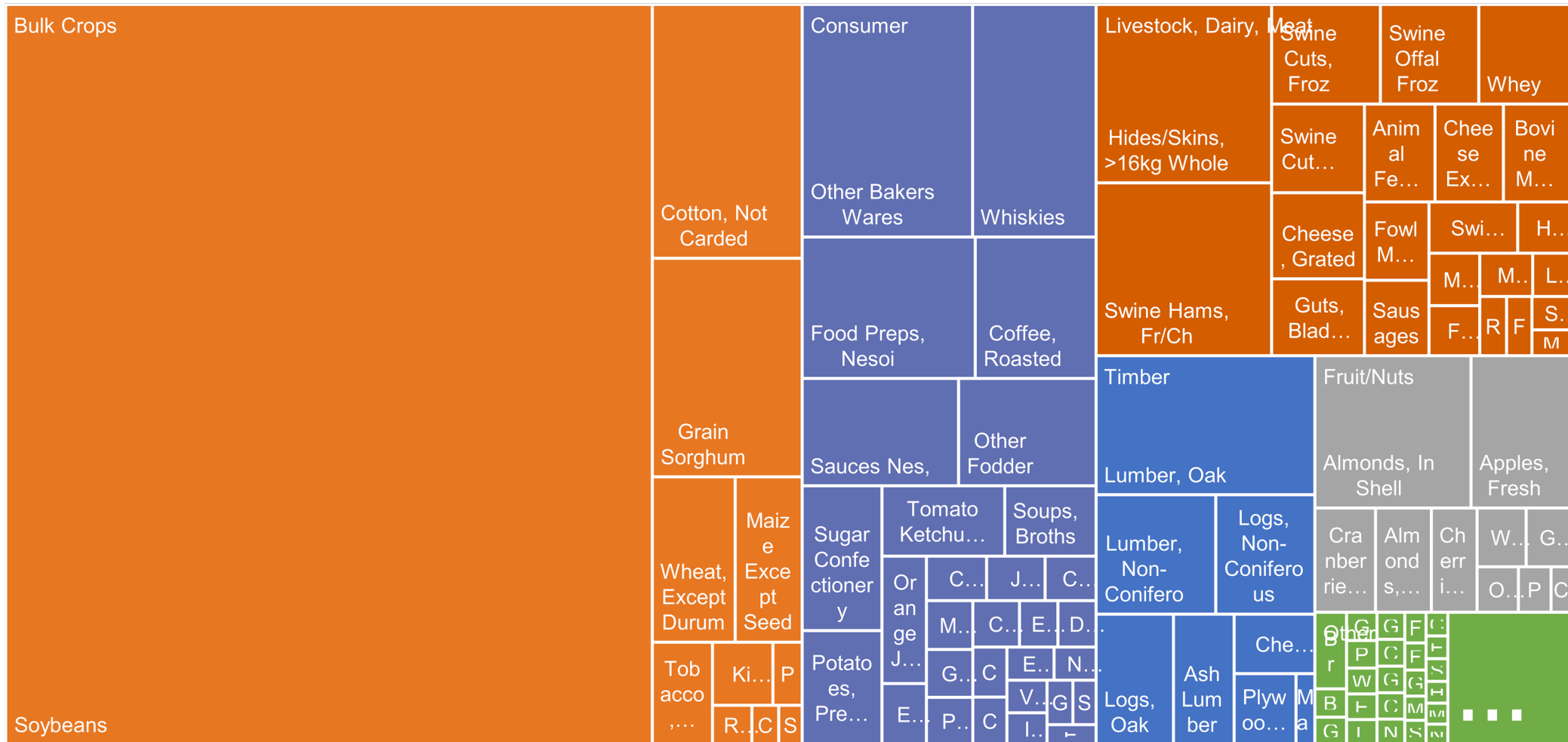


U.S. Soybean Trade Changes from 2017 (Jan-Jul)



■ Change in Quantity (MT) ■ Change in Value (1,000 \$)

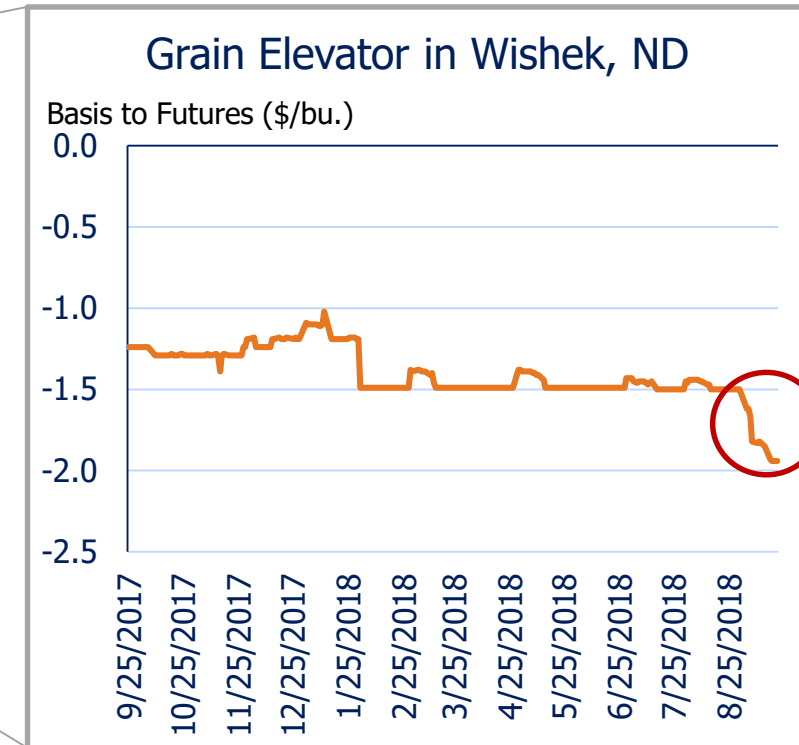
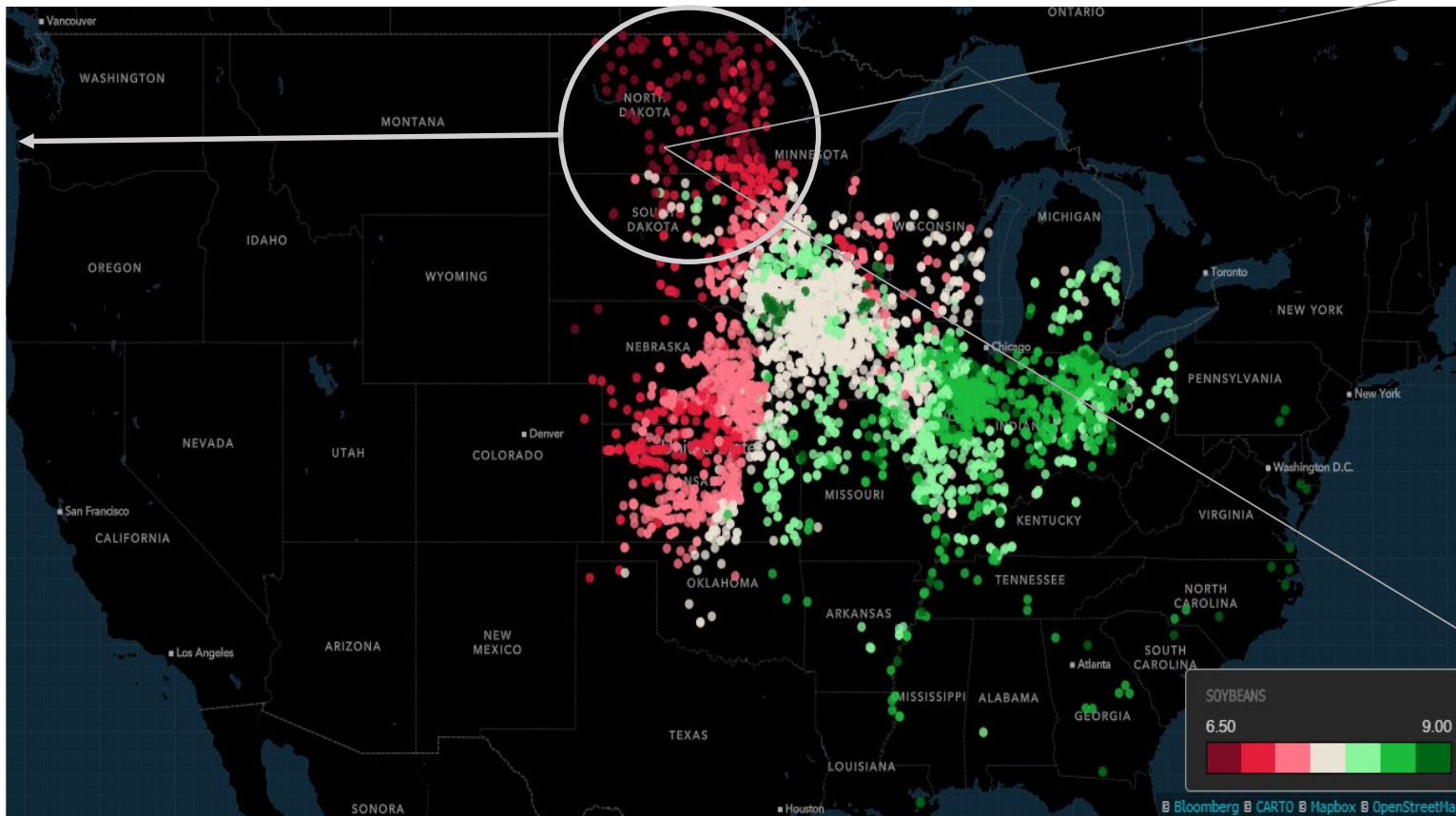
Tariffs Specific to Agriculture



Source: USDA, FAS, GATS Database - prepared by Jackson Takach.

Soybean growers hit hardest in upper plains

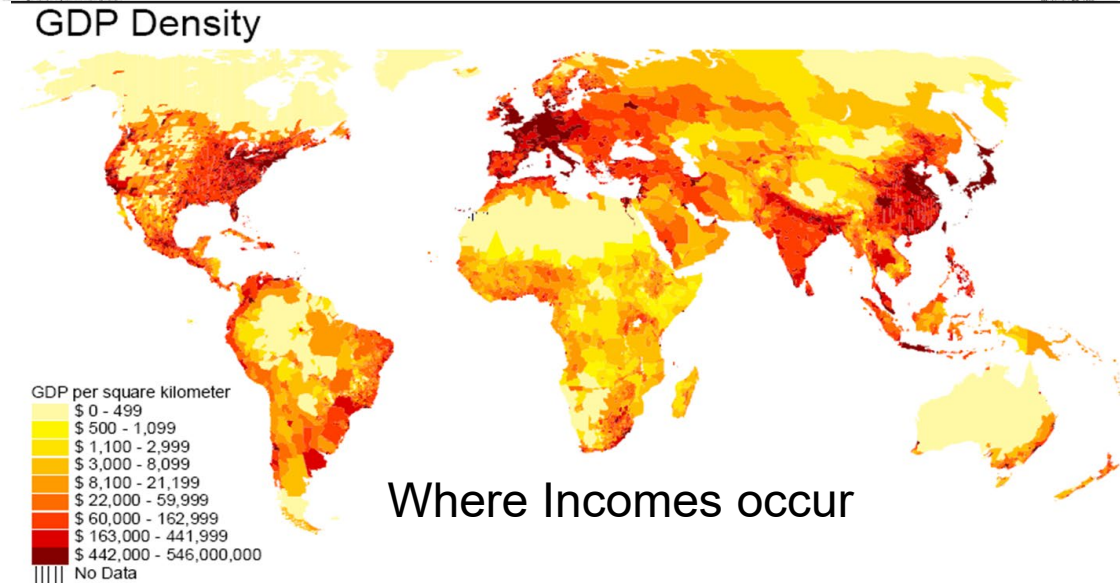
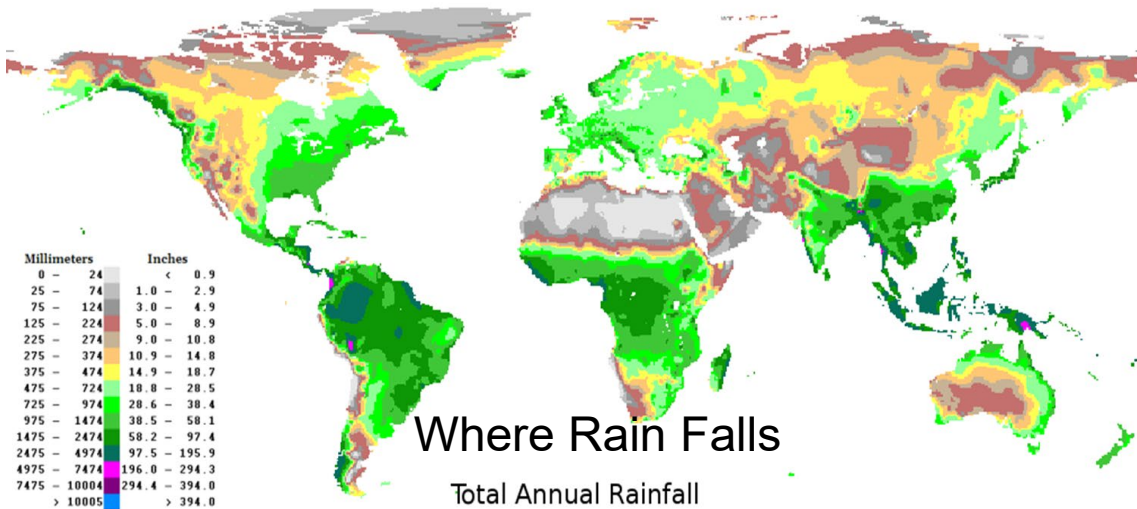
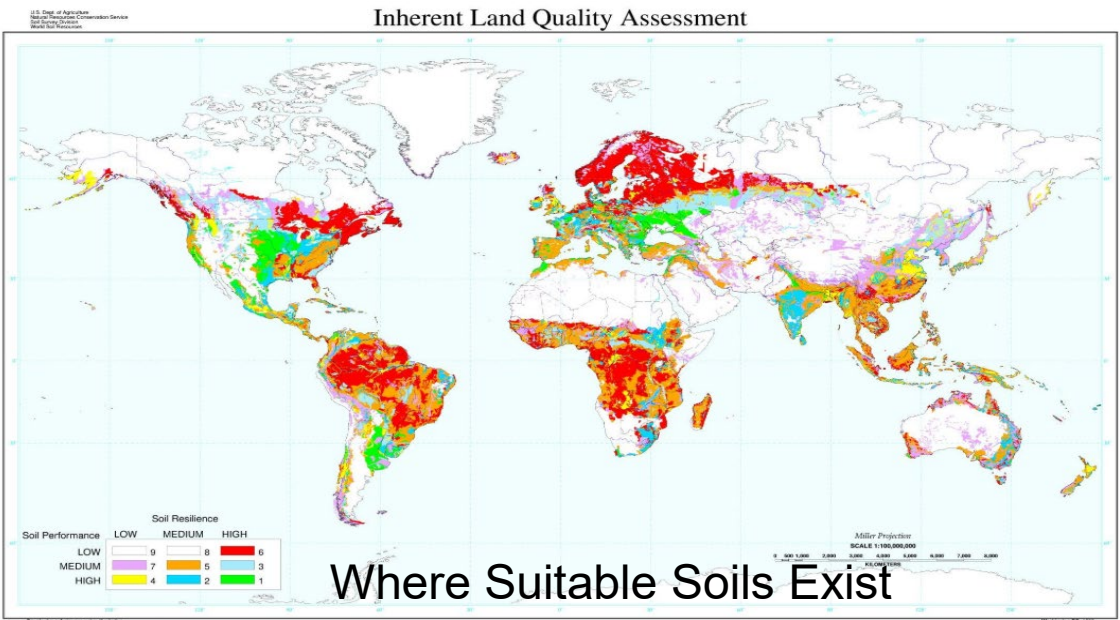
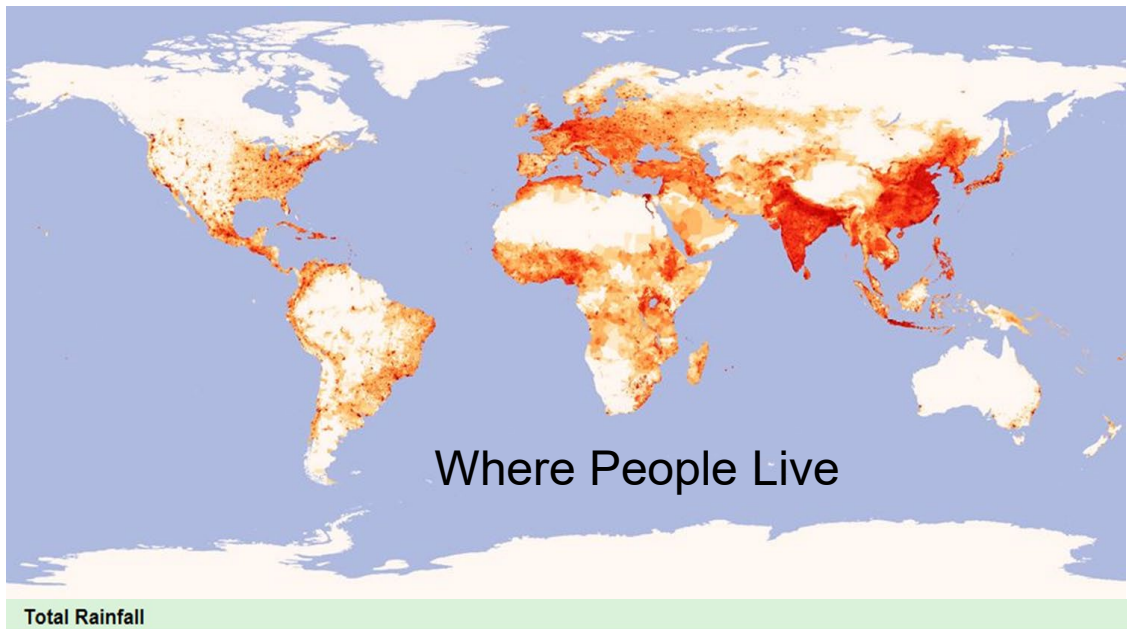
DTN/CGB Cash Soybean Bids on Sept. 21, 2018



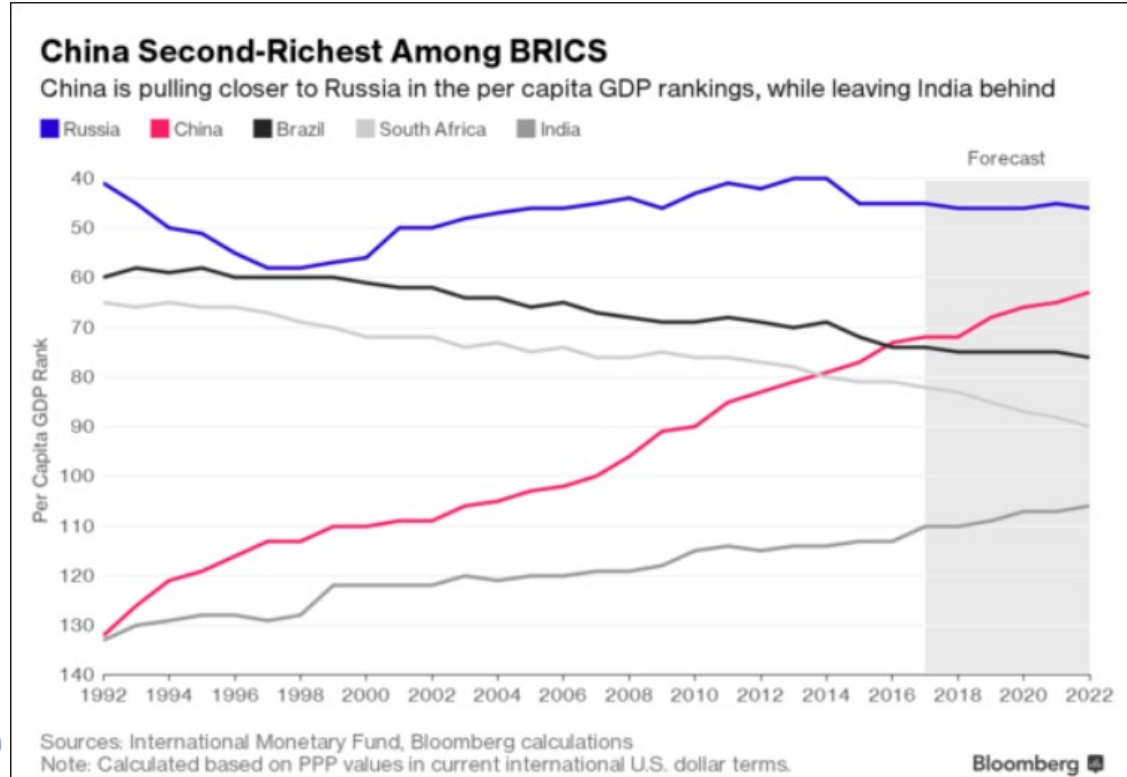
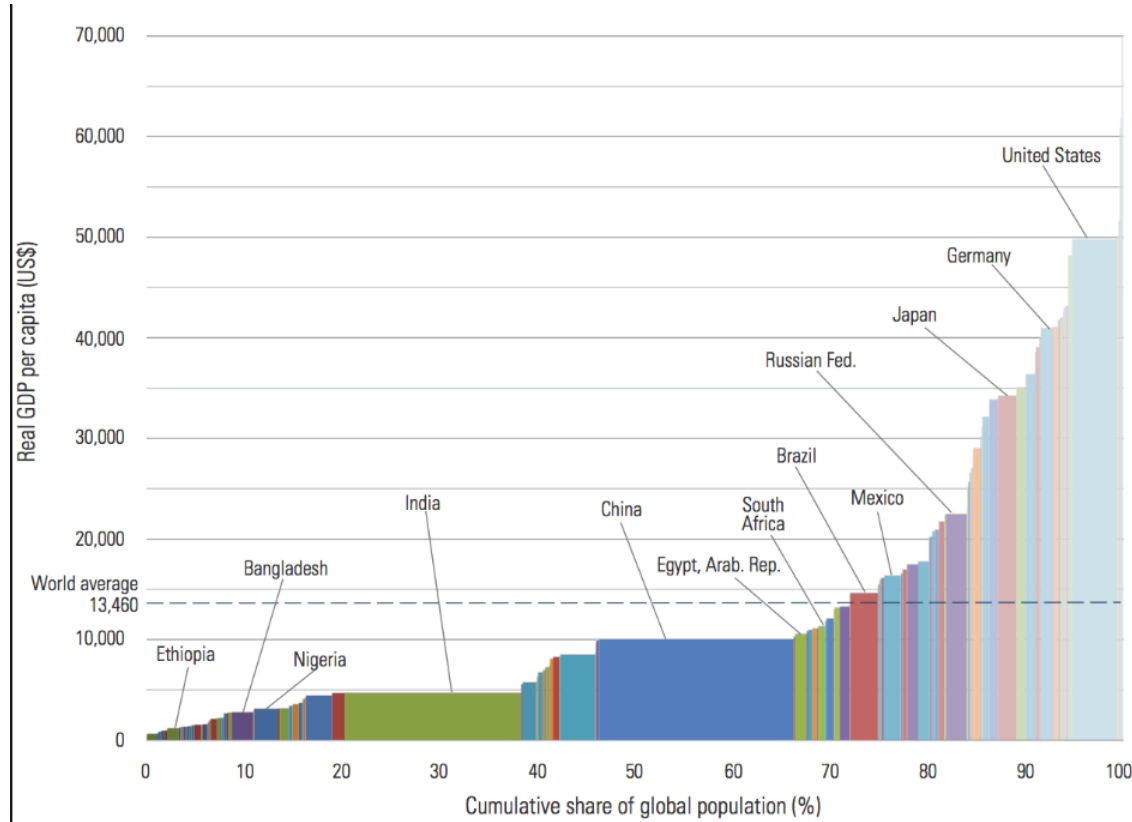
Tailwinds

IT'S NOT ALL BAD NEWS.....

A brief graphical summary of the world



Food Demand: What matters? What will matter?



Income increases calories and quality, shifting toward populations

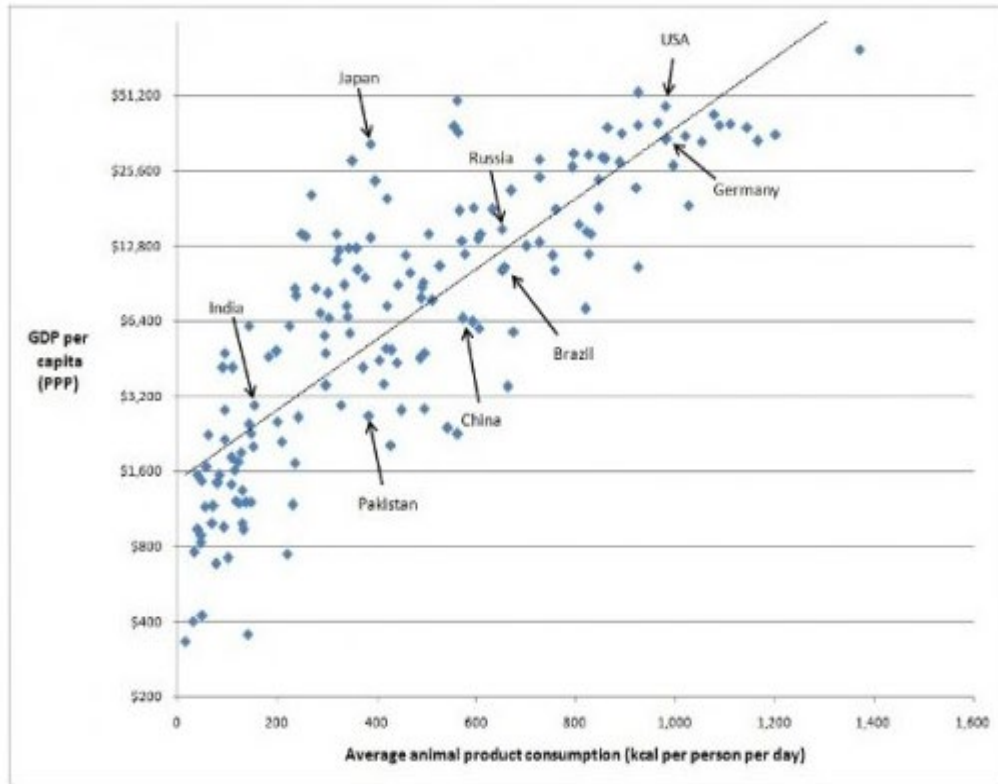
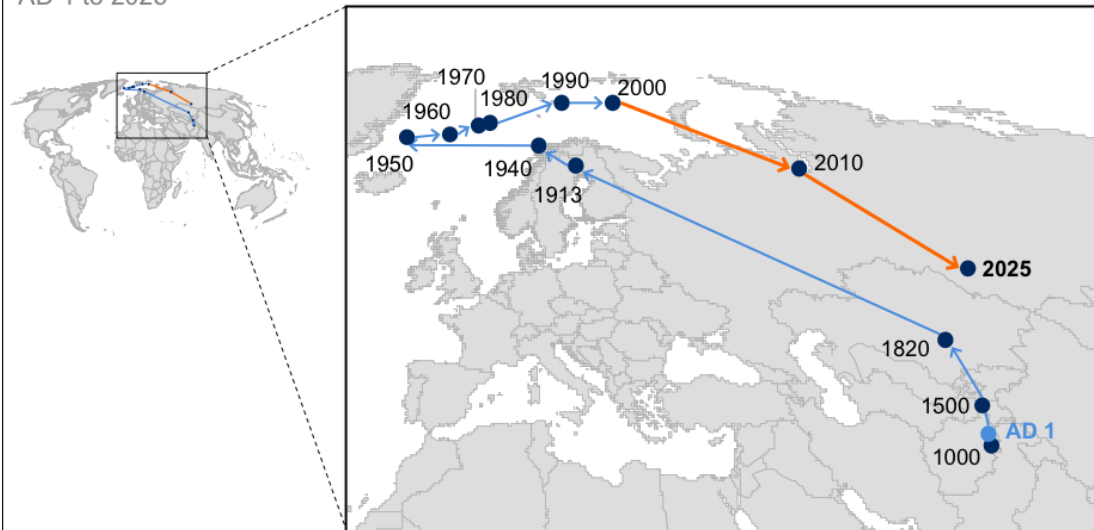


Figure 1: A scatter plot of countries comparing GDP per capita [PPP, log scale] and meat consumption in calories per person per day. Source: IMF, FAO

Exhibit 3

By far the most rapid shift in the world's economic center of gravity happened in 2000–10, reversing previous decades of development

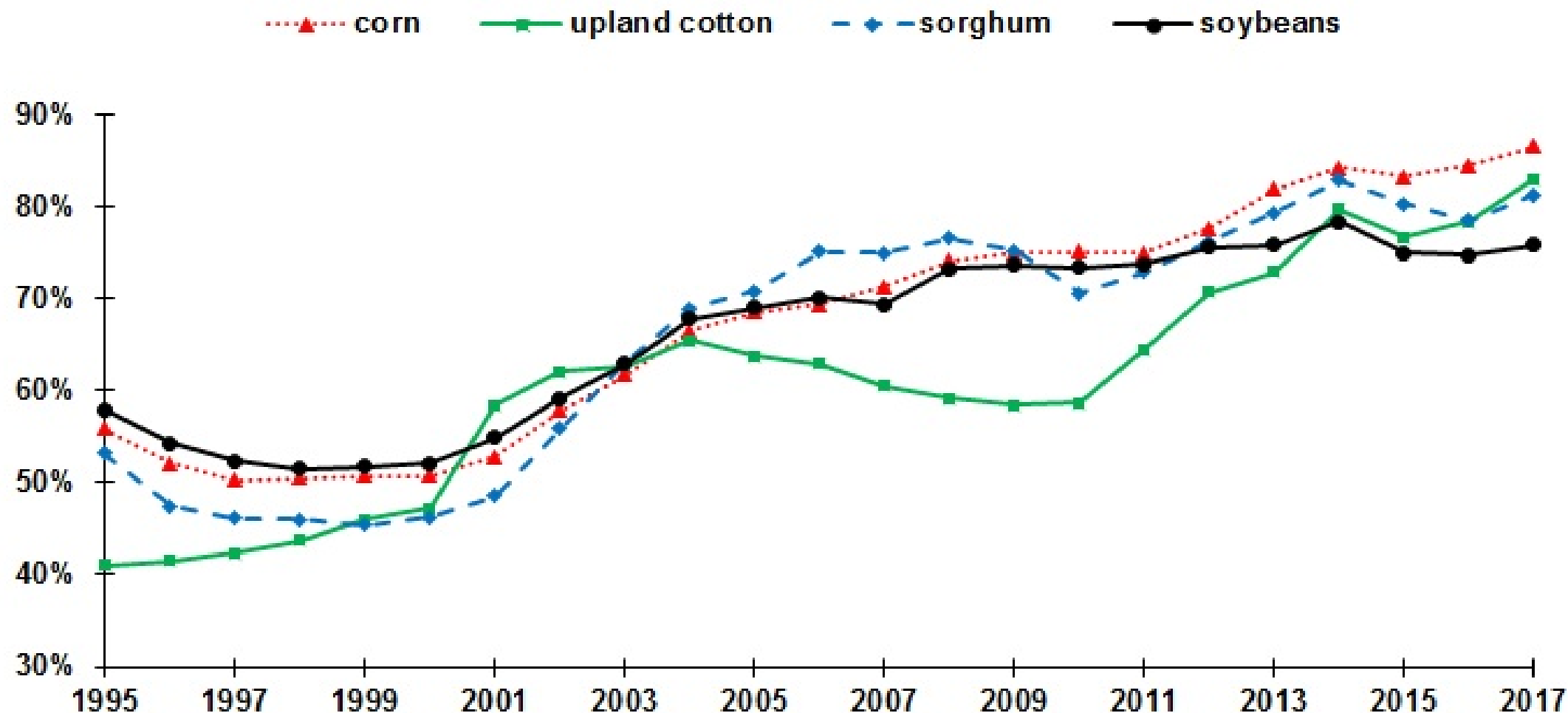
Evolution of the earth's economic center of gravity¹
AD 1 to 2025



¹ Economic center of gravity is calculated by weighting locations by GDP in three dimensions and projected to the nearest point on the earth's surface. The surface projection of the center of gravity shifts north over the course of the century, reflecting the fact that in three-dimensional space America and Asia are not only "next" to each other, but also "across" from each other.

SOURCE: McKinsey Global Institute analysis using data from Angus Maddison; University of Groningen

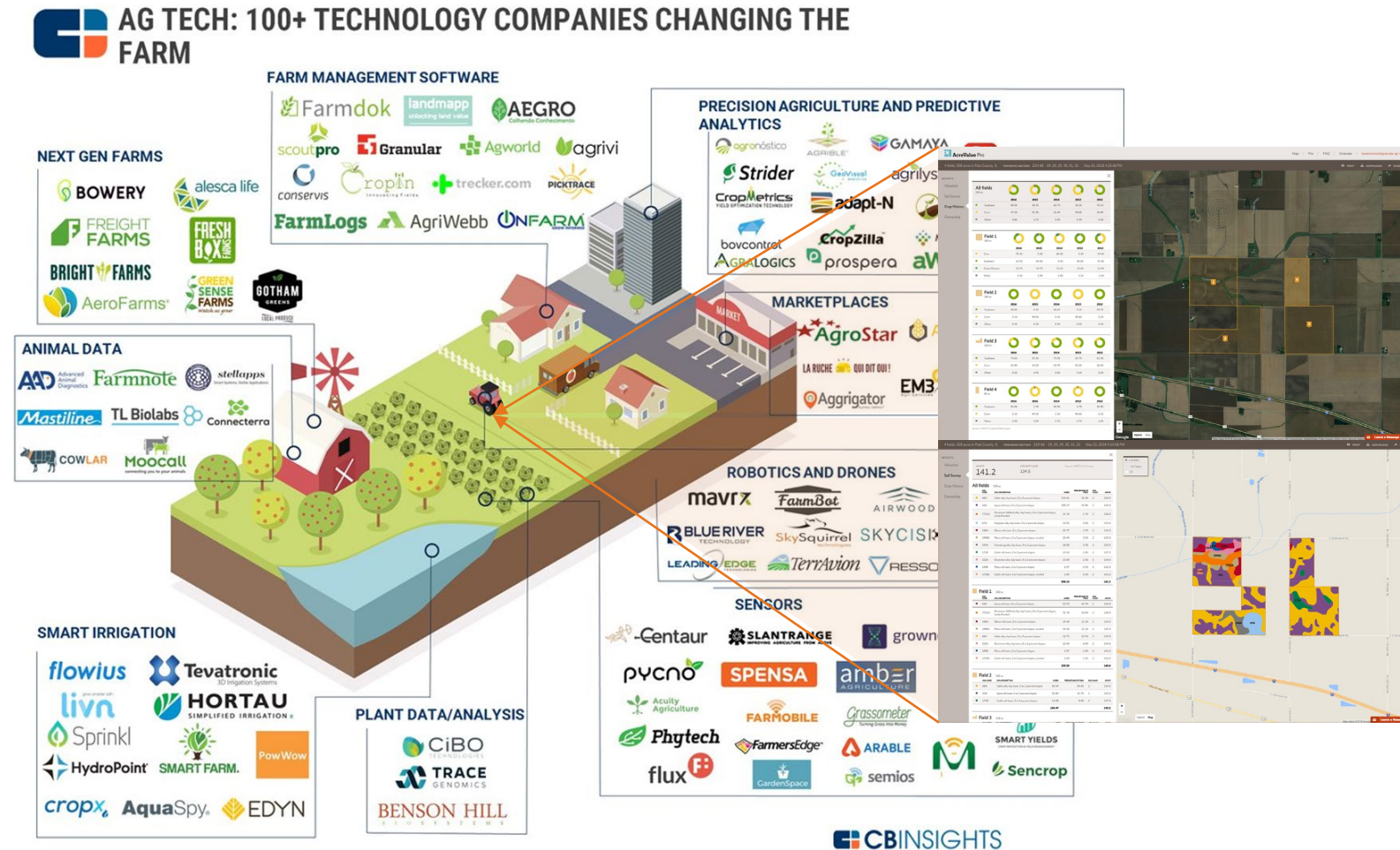
Figure 1. Share of per Acre Value of Production at Harvest Covered by Crop Insurance, U.S., 7-year Average, 1996-2017 Crop Years



Source: Zulauf, C., G. Schnitkey, J. Coppess, and N. Paulson (2017) "Crop Insurance per Acre Coverage: Historical Experience and Potential Issues" *farmdoc daily* (7): 225, December 7, 2017

Tailwinds: Changes in Production Agriculture

- Agricultural technology adding yield, impacting cost structures, changing access to consumer information and willingness-to-pay
- “Financialization” of farmland and farm assets, and rationalization of prices occurs over long periods
- Very strong pipeline and financing of ag tech



Conclusions

- Many of the headwinds driven by short-run trends
 - Low returns
 - Rising interest rates
- Many of the tailwinds related to long-run trends
 - Global demand for calories
 - Thin markets
 - Structural change in agricultural production