



Introduction to Investing in Agriculture – Framing Opportunities Across the Value Chain and Around the Globe

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2017 IFAMA World Conference
Miami
June 21



HighQuest Group - advisory services, media and industry events



*Strategic advisor in global food,
agribusiness and biofuels*



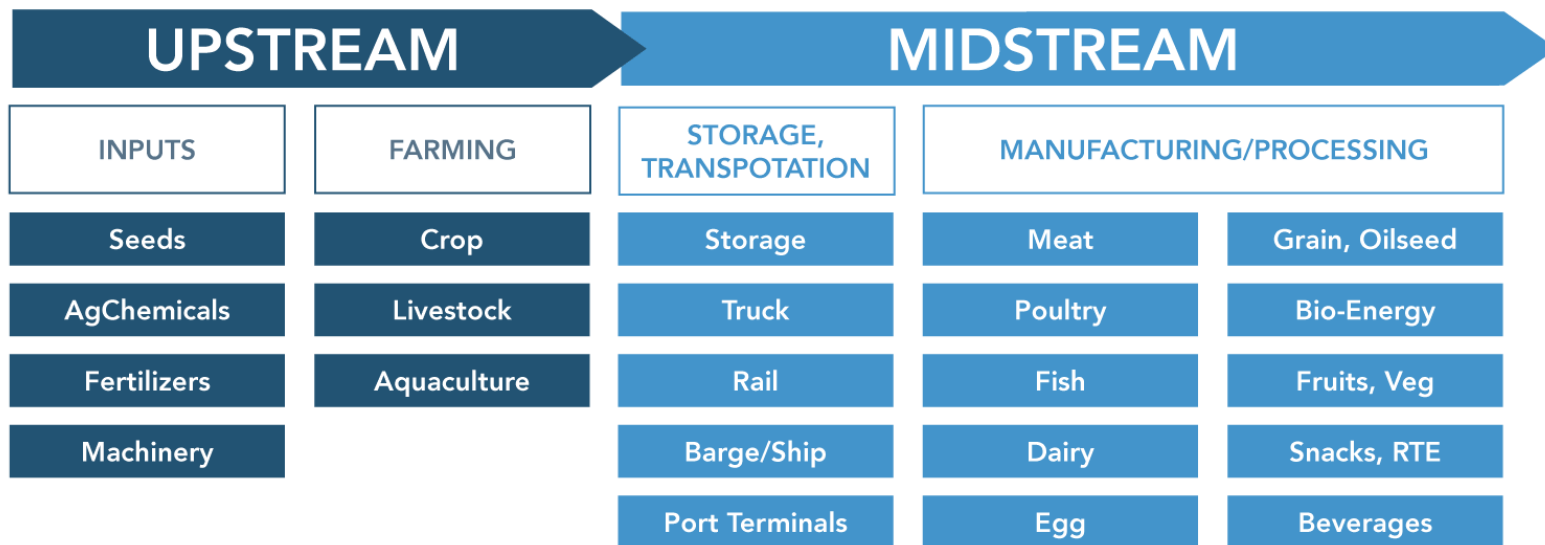
*The world's leading resource for events, research, and insight
into the global agricultural investment sector*

Supporting informed decision-making for strategic and financial investors across the global agricultural value chain



HighQuest Consulting

FOOD & AGRIBUSINESS VALUE CHAIN



Who are HighQuest Consulting's Clients?

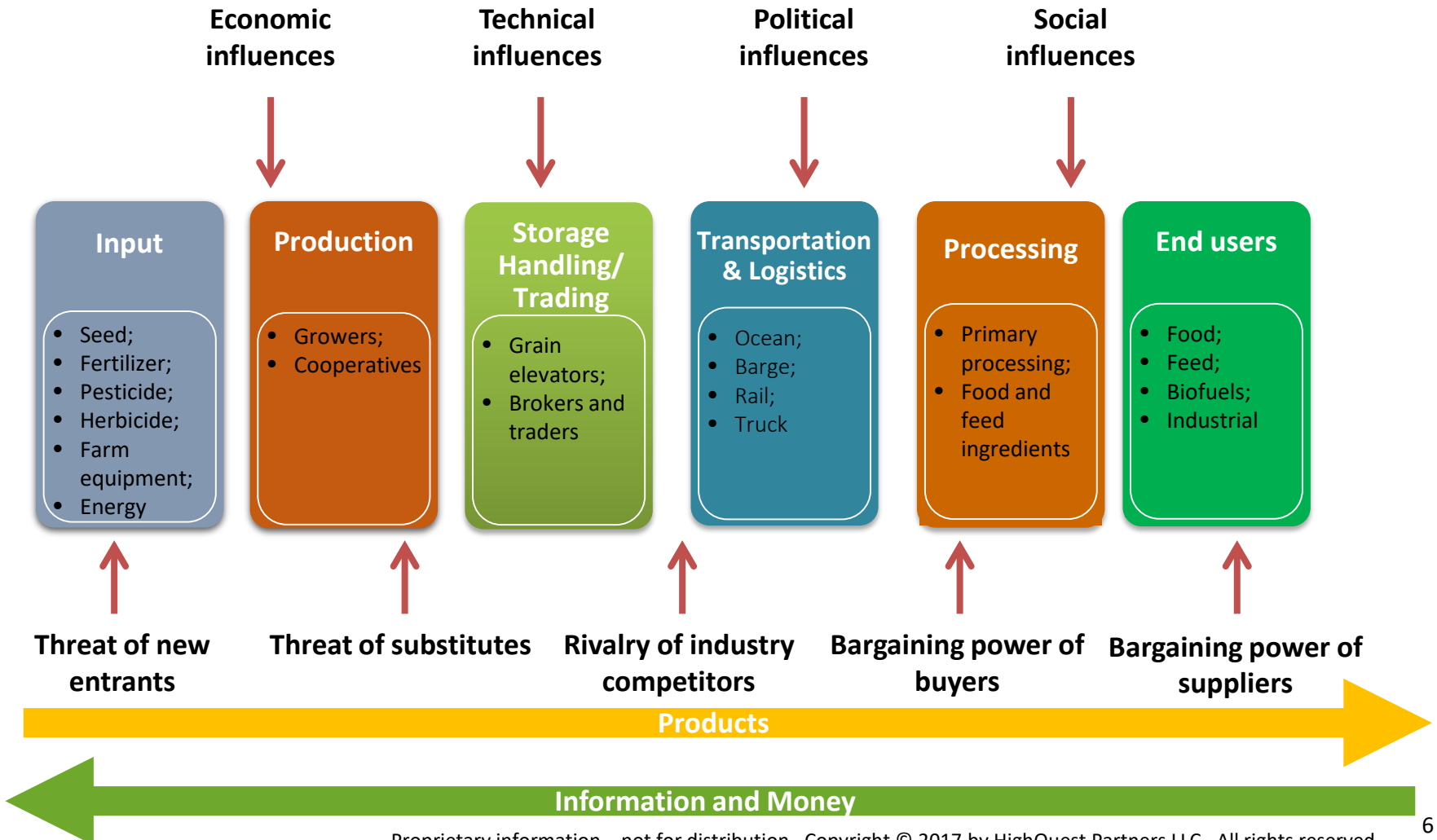
TRADERS, PRIMARY PROCESSORS	FINANCIAL INVESTORS	FOOD PROCESSORS	AG INPUT PROVIDERS	EQUIPMENT MANUFACTURERS	GOVERNMENT ASSOCIATIONS	CO-OPS	AND MORE
ADM Bunge Mitsui & Co Samsung	Andra A-P-fonden Apollo Investment Corporation GE Capital	Dean Perdue Suntory Tyson Foods	Bayer Crop Science Dow AgroSciences Novus Syngenta	Bühler CNH John Deere	OECD USDA USSEC	OceanSpray Mountain View Seeds Wheat Growing Connection Solutions	Dupont Pioneer CHS CPP Investment Board

Why food and agriculture – investment thesis?



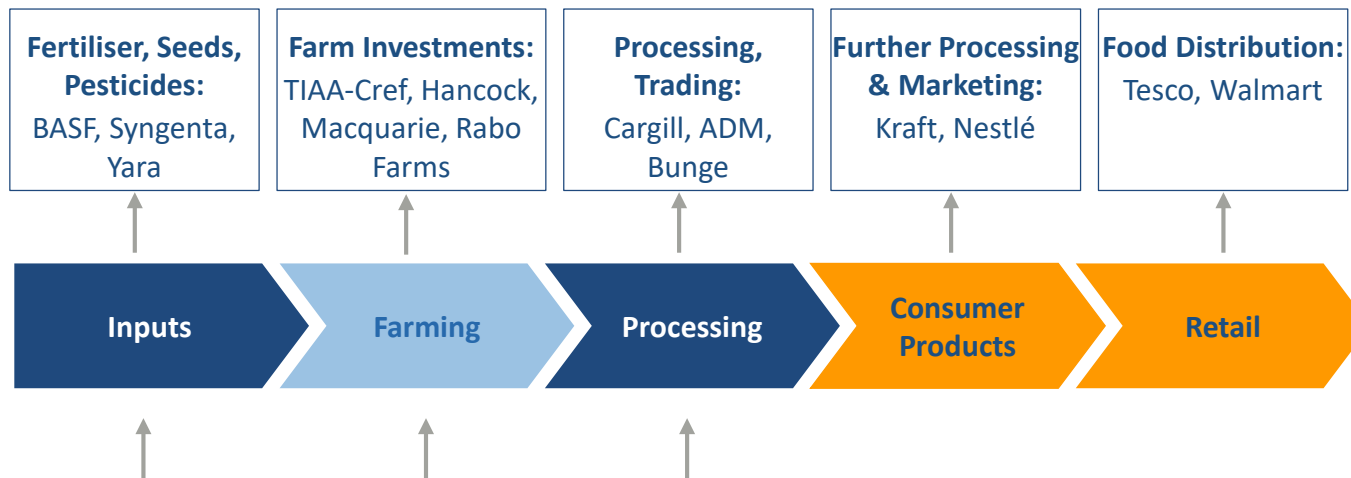
Agriculture value chain - “conceptually simple and yet challenging for efficient execution”

A complex market structure requires appreciation for how margins are shared amongst players at different points along the supply chain.



Where to invest in food/agriculture?

- There are many ways to invest in most stages of the agricultural value chain via equities, corporate bonds, futures, options and ETF's.
- However the farming/production sector is not as easily investable, as it traditionally has been a fragmented industry with tightly held family run enterprises. This is slowly changing due to increased consolidation, driven by the demographics of the farming community and pressures to achieve economies of scale in production.



Institutional Investment In Agribusiness

Direct Investments
Closed-End Funds
Tailor-Made Structures

Range of investment opportunities in the ag sector

Real Assets

- Farmland
- Infrastructure

Private Equity

- Upstream
 - inputs(seed, chemicals, fertilizer, technology services, capital goods)
- Downstream
 - storage and logistics
 - value added processing of ingredients
 - food/feed/industrial processing

Venture Capital

- Biotech
- Enabling technologies (precision ag, biologicals and big data)

Water theme investments

Liquid Assets

- Public equities
- Commodity index funds

Agriculture – an emerging asset class?

	Farmland USD \$ billion	Timber USD \$ billion
Total land value	8,300*	425*
Investable universe	1,000*	300*
Institutional ownership	45*	60*

- Institutional investment in farmland represents less than 0.5*% of the total – most land around the world is privately owned.
- However institutional investment in farmland has been growing at 8-10*% p.a. ; currently +/- \$45* billion.
- While historically most investment has been concentrated in North and South America, there is new institutional appetite for agricultural investment in Australia and the Eastern Europe.
- While farmland is an immature asset class in comparison to timber, the investable universe for farmland is over 3*x size – many traditional institutional timber investors are either now investing or looking to invest in farmland.

**Estimates*

Key issues driving farmland values

➤ Population growth and increase in GDP

- World population 9 billion in 2050
- Increased demand in developing markets, particularly Asia, SE Asia and North Africa
- Shift in diets from grain to animal protein (*Bennett's law*)

➤ Increasing urbanization

- Pressure on available arable land for crop production
- Increasing reliance on processed foods

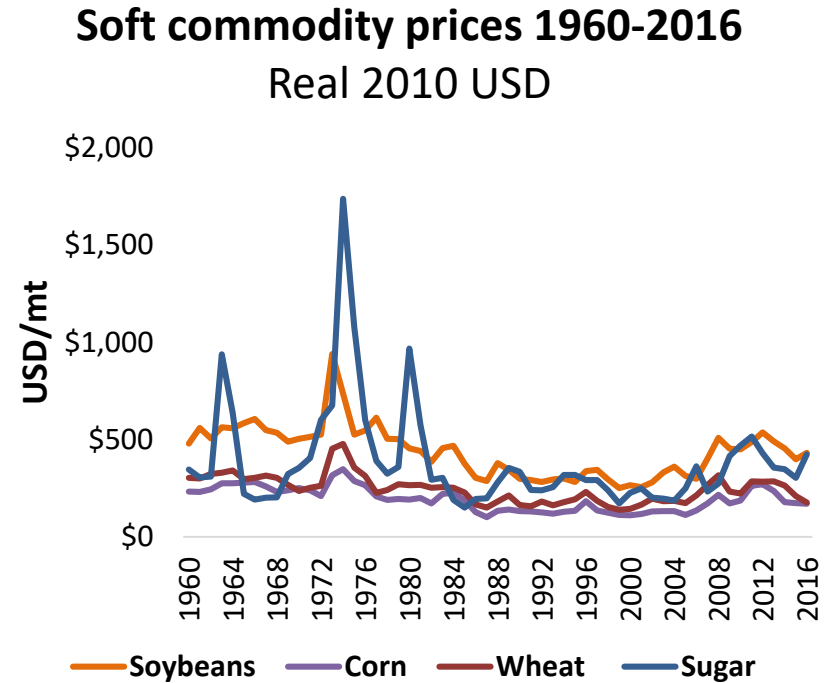
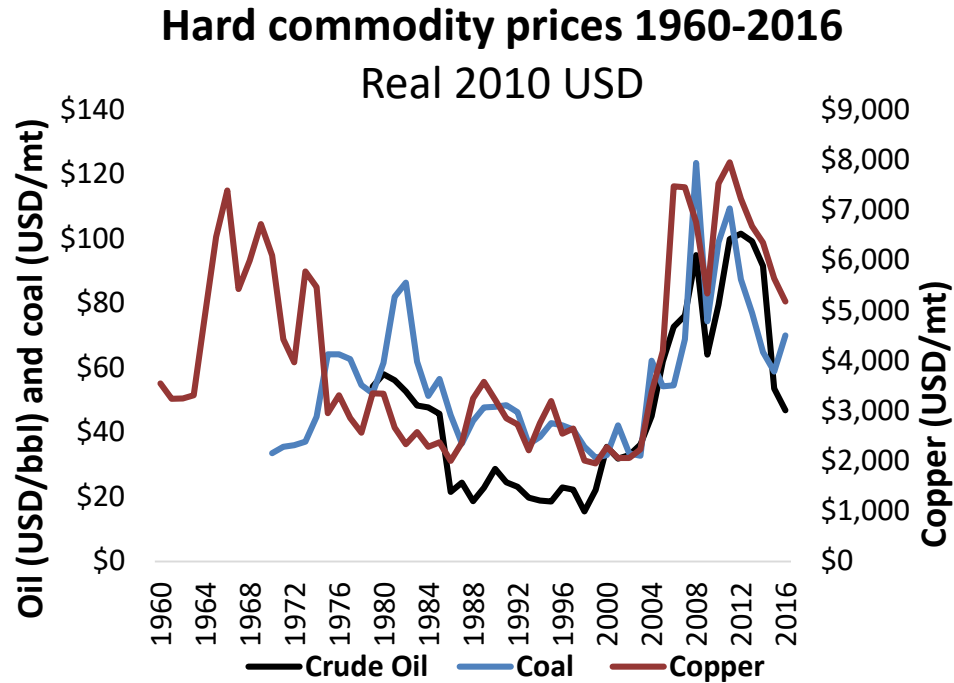
➤ Constraints on supply

- Water access
- Climate change
- Linkage to energy markets(biofuel mandates)
- Deceleration of yield increases
- Environmental regulations on production

➤ Human capital

- Generational transfer in both developed and developing markets
- Lack of capacity building in developing markets

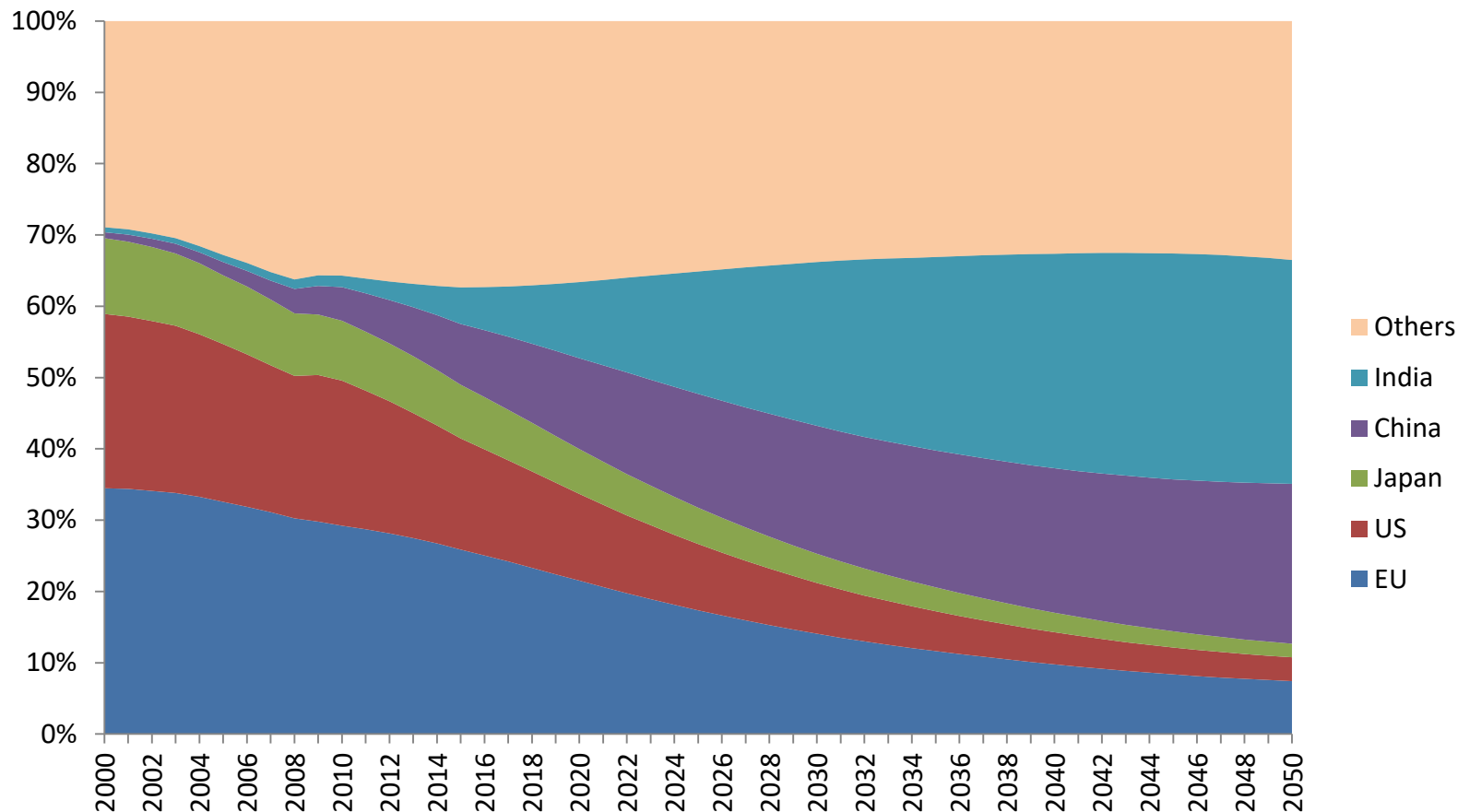
End of the commodity super cycle?



Source: World Bank

Middle class consumption in China and India continues to fuel growing demand for commodities

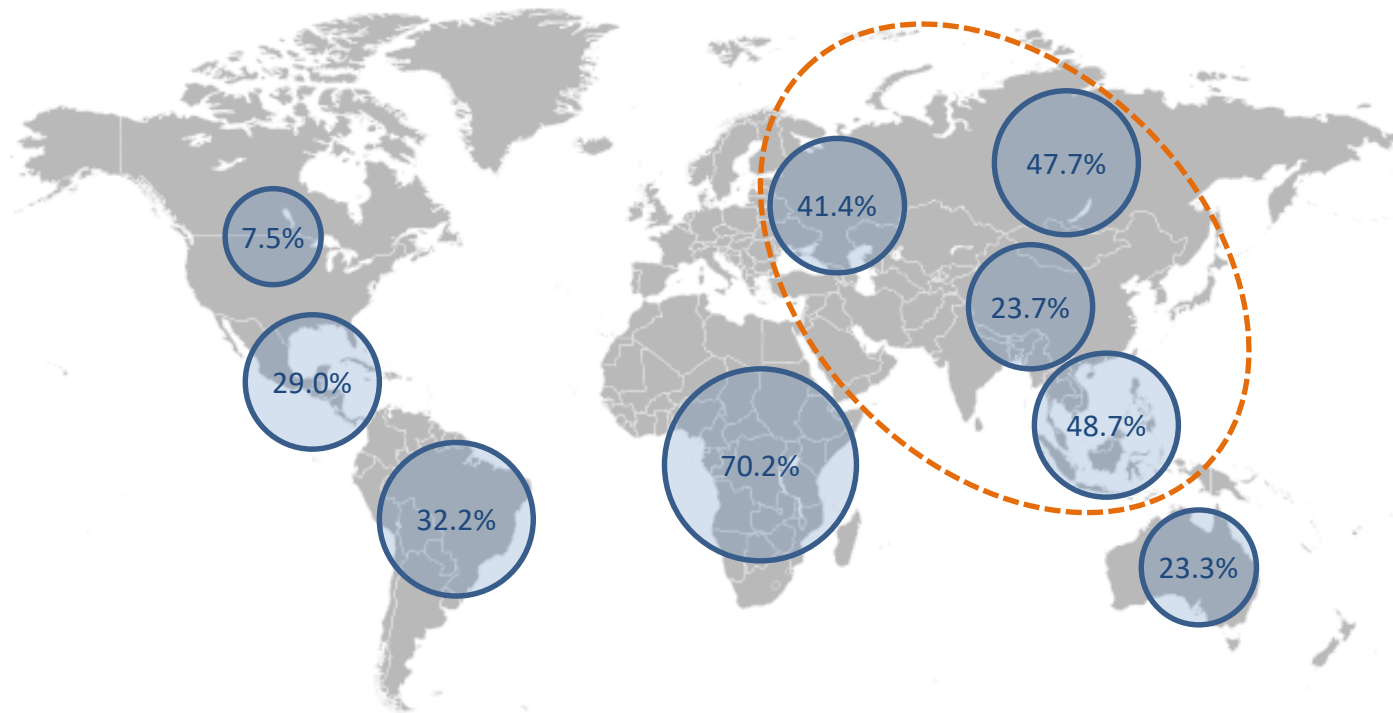
**Global Middle Class Consumption
2000-2025**



Source: OECD

Protein demand increases a global phenomenon

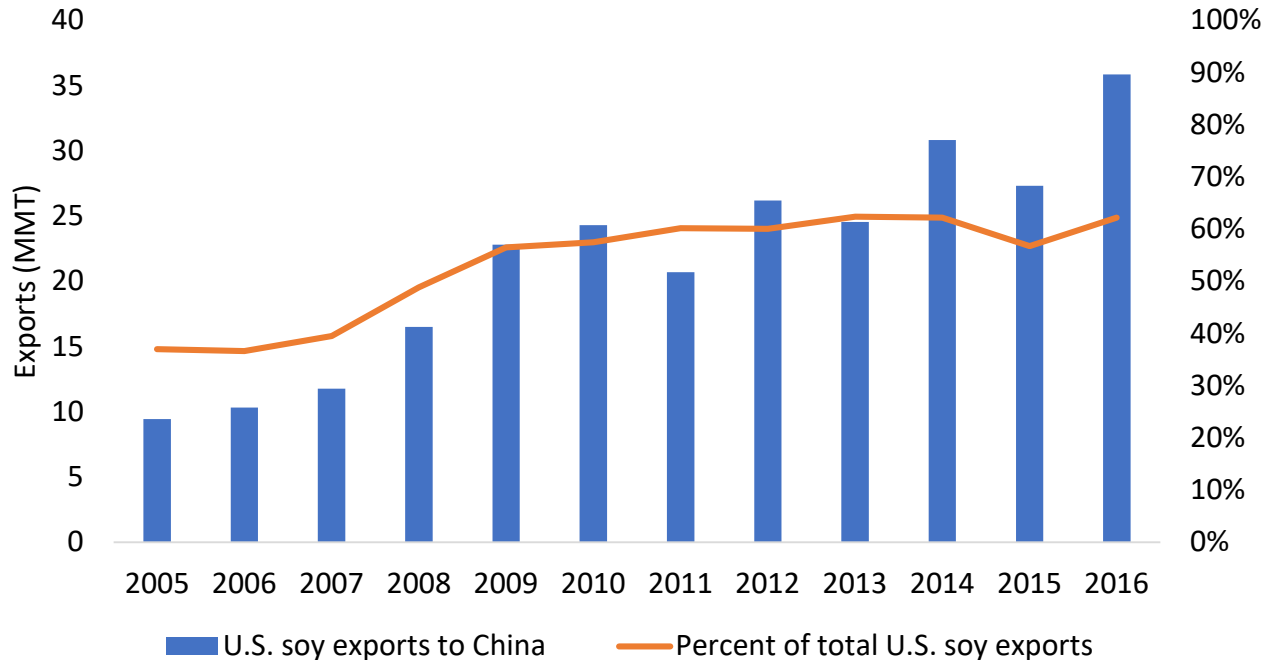
Substantial increases in protein consumption between 2000 and 2010



China has driven demand for U.S. exports over past decade

U.S. agricultural exports to China have grown more than 200% in the past decade, reaching over \$20.2 billion in 2015

U.S. Soybean Exports to China

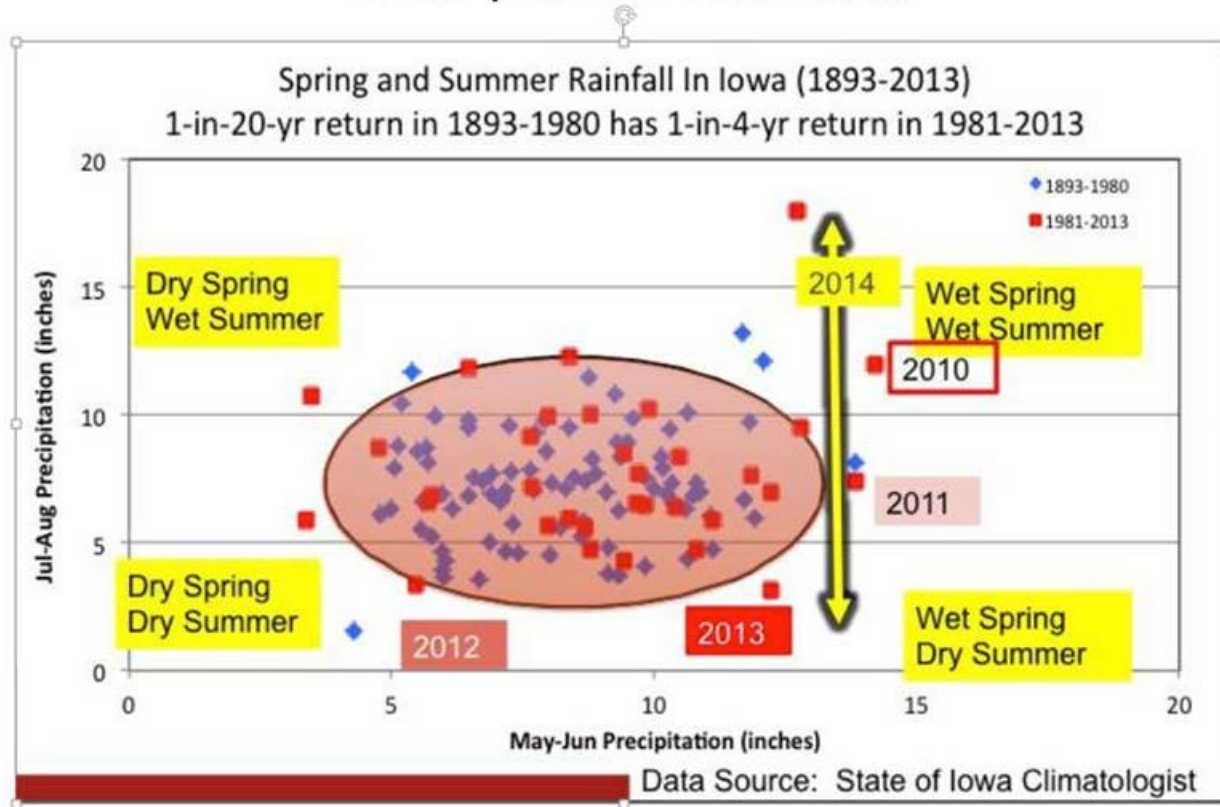


Source: USDA FAS

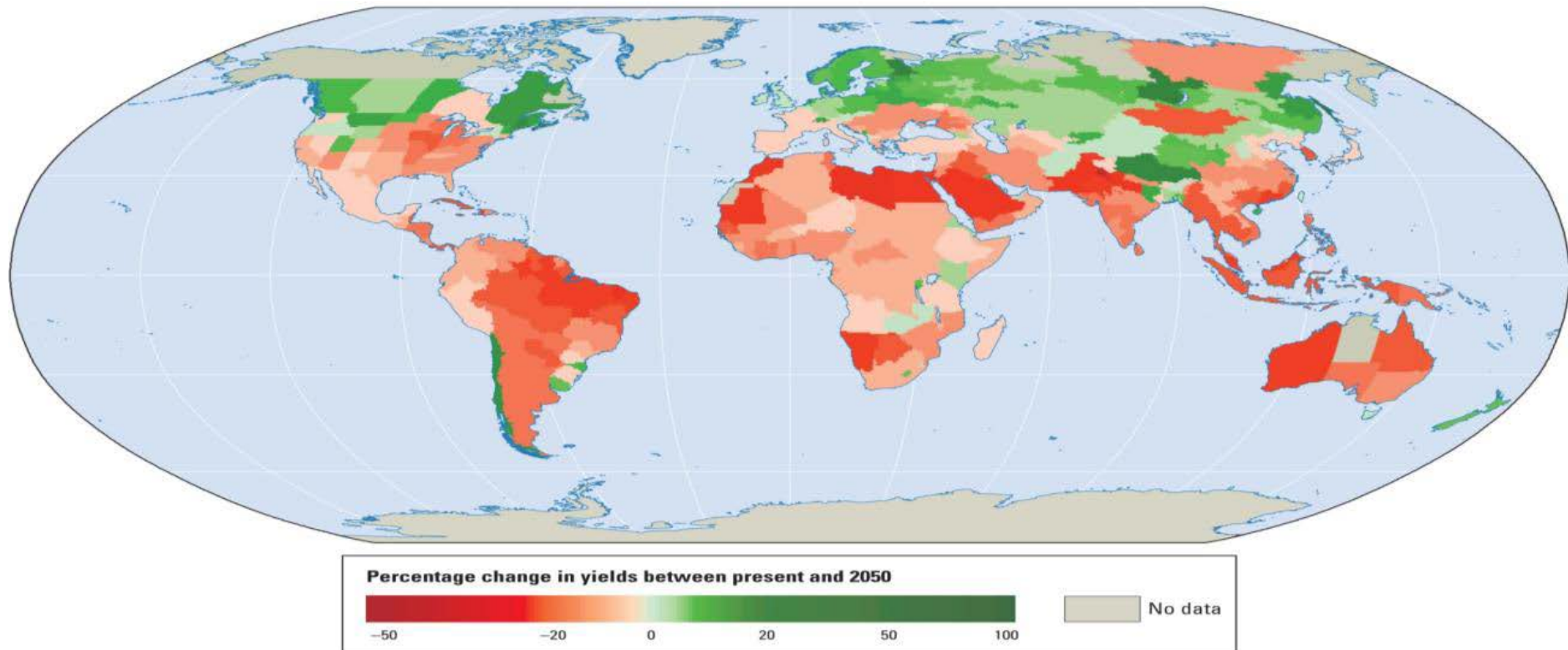
Impact of climate change in Iowa

Even in the USA!

In Iowa, the last 5 years are all outside the 95th percentile of 120 years of rainfall data



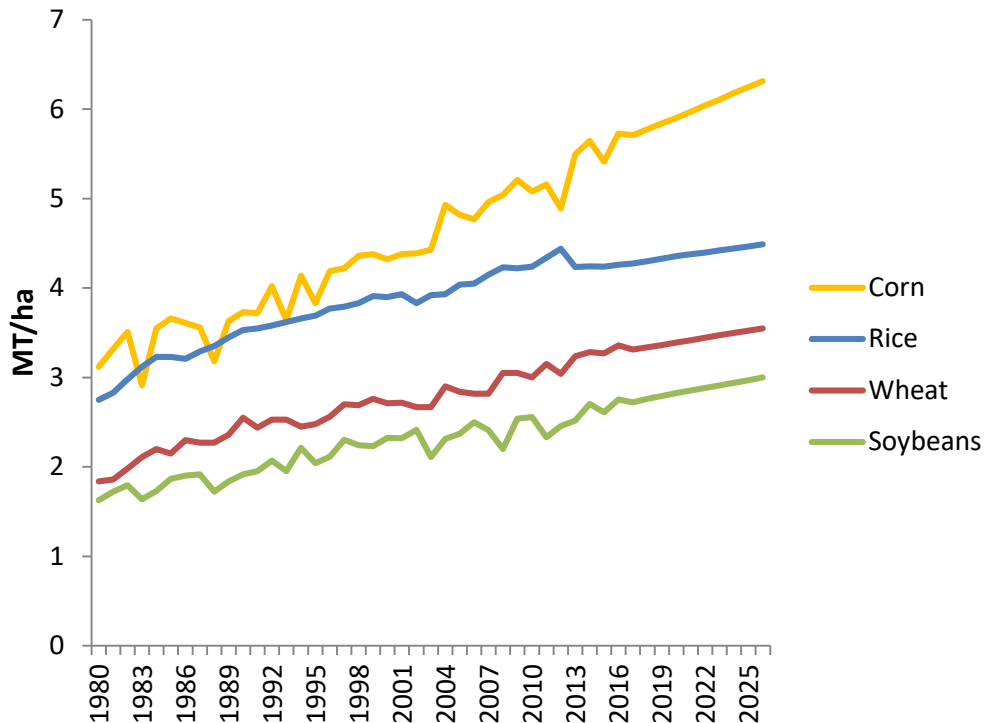
Potential agricultural yield decreases by 2050 due to climate change



Source: C. Muller (2010) "Climate Change Impacts on Agricultural Yields," background note to the "World Development Report 2010."

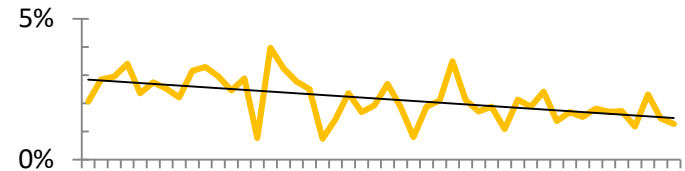
Have yield improvements hit an inflection point?

Global Yields for 4 Major Crops
Historical and Projected

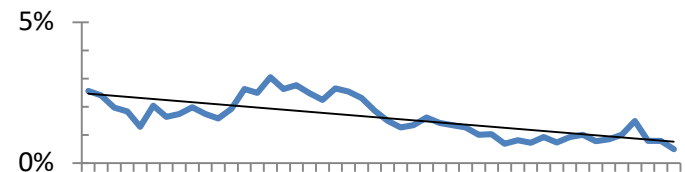


Source: USDA, HighQuest analysis

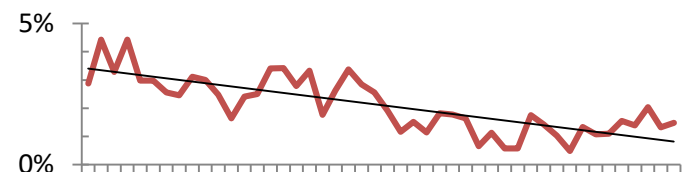
Trailing 10-Year Yield Improvement
Corn



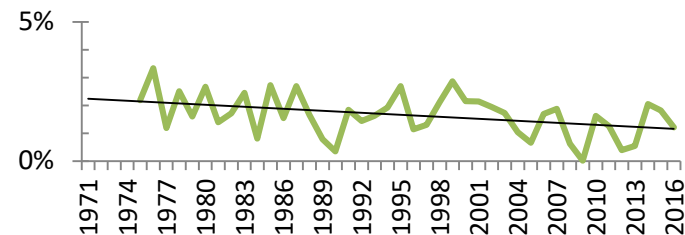
Rice



Wheat



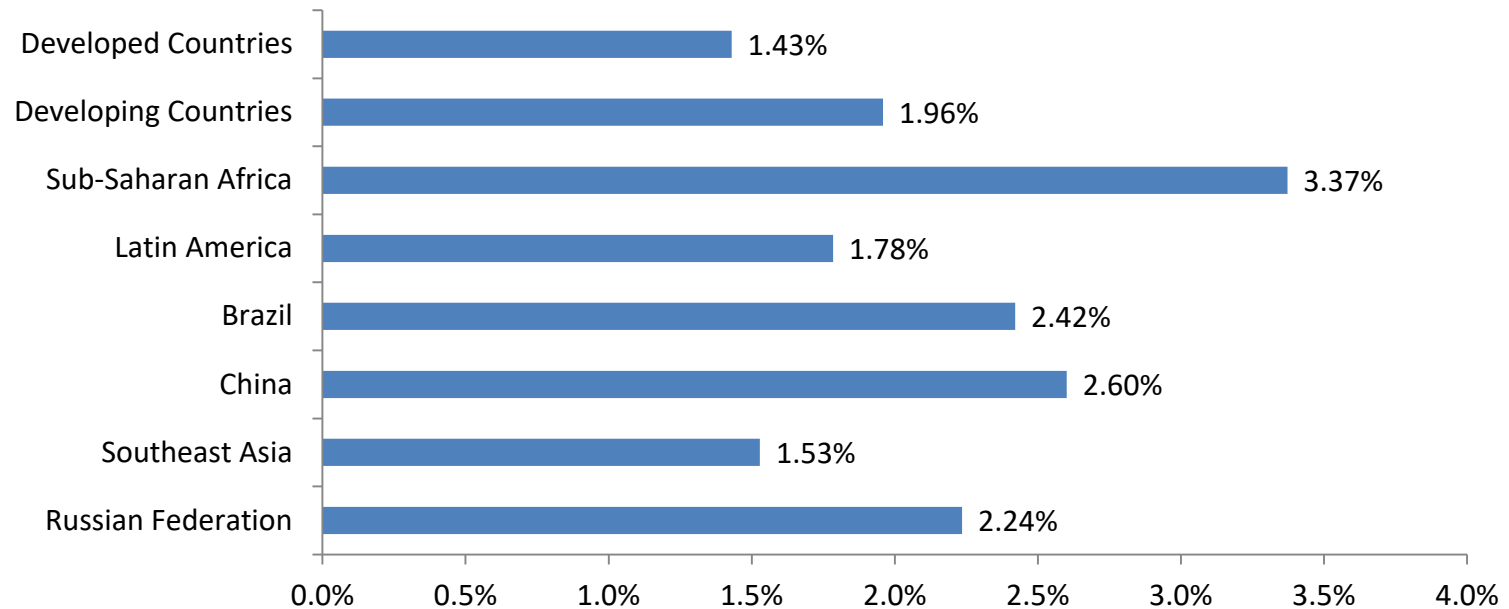
Soybeans



Opportunities for increasing productivity in emerging markets

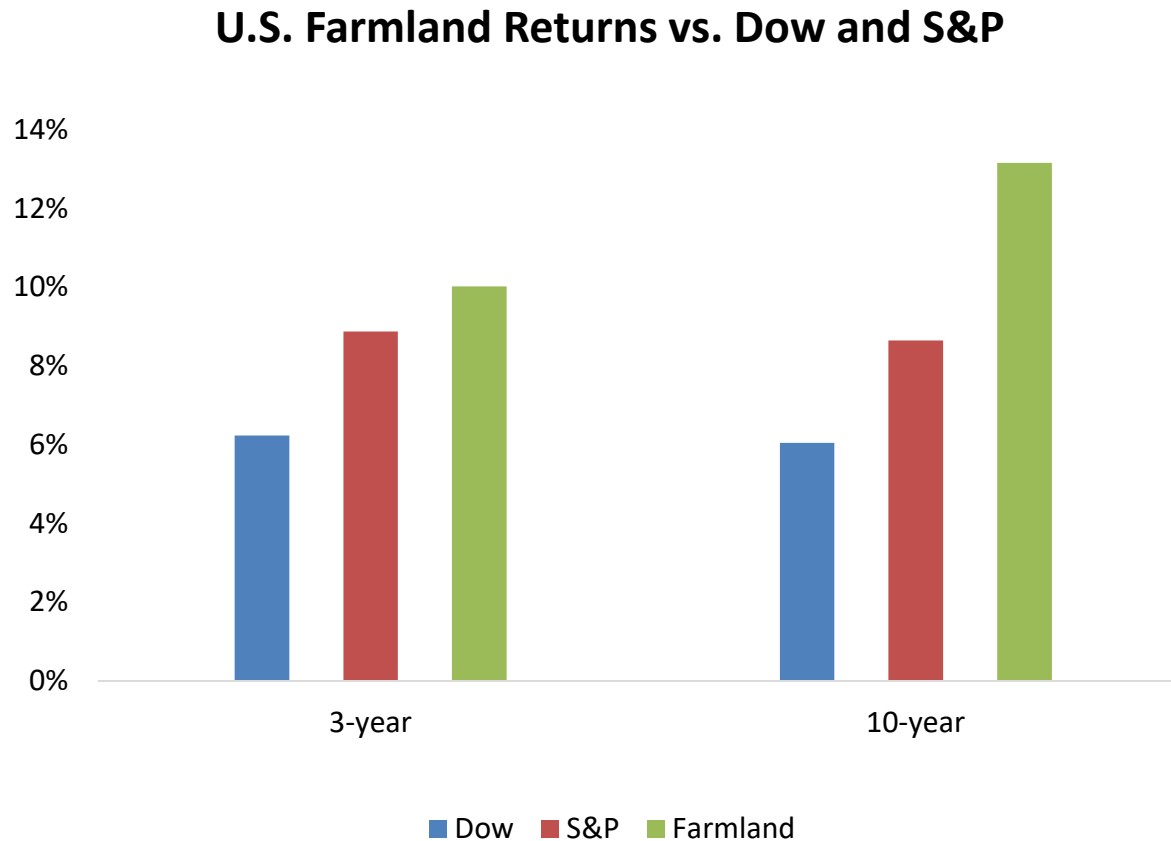
Total Factor Productivity Growth of Agriculture

Average Change in Growth Rates (1961-2009)

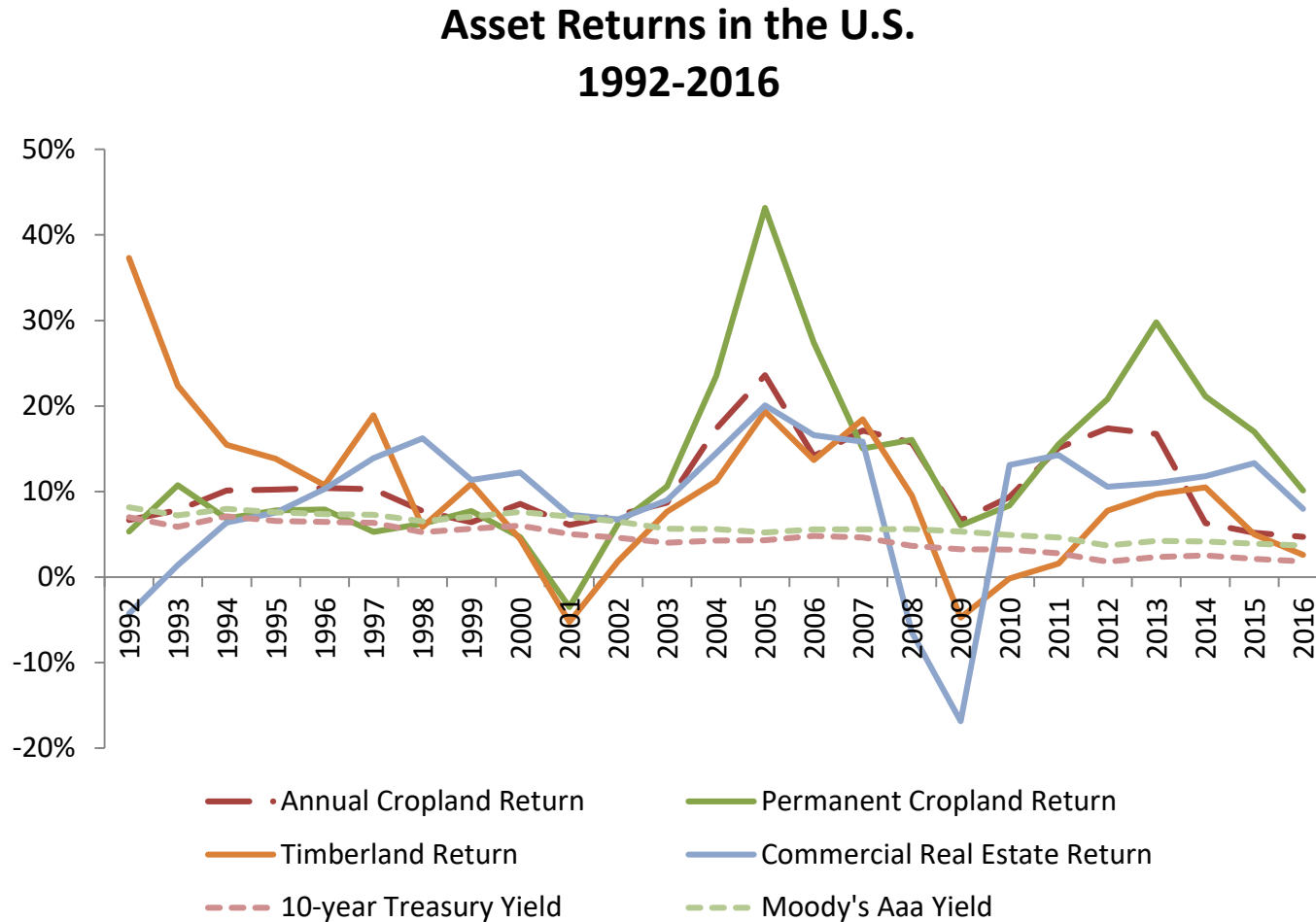


Source: OECD, FAO

U.S. farmland returns have exceeded DOW and S&P over the last 10 years

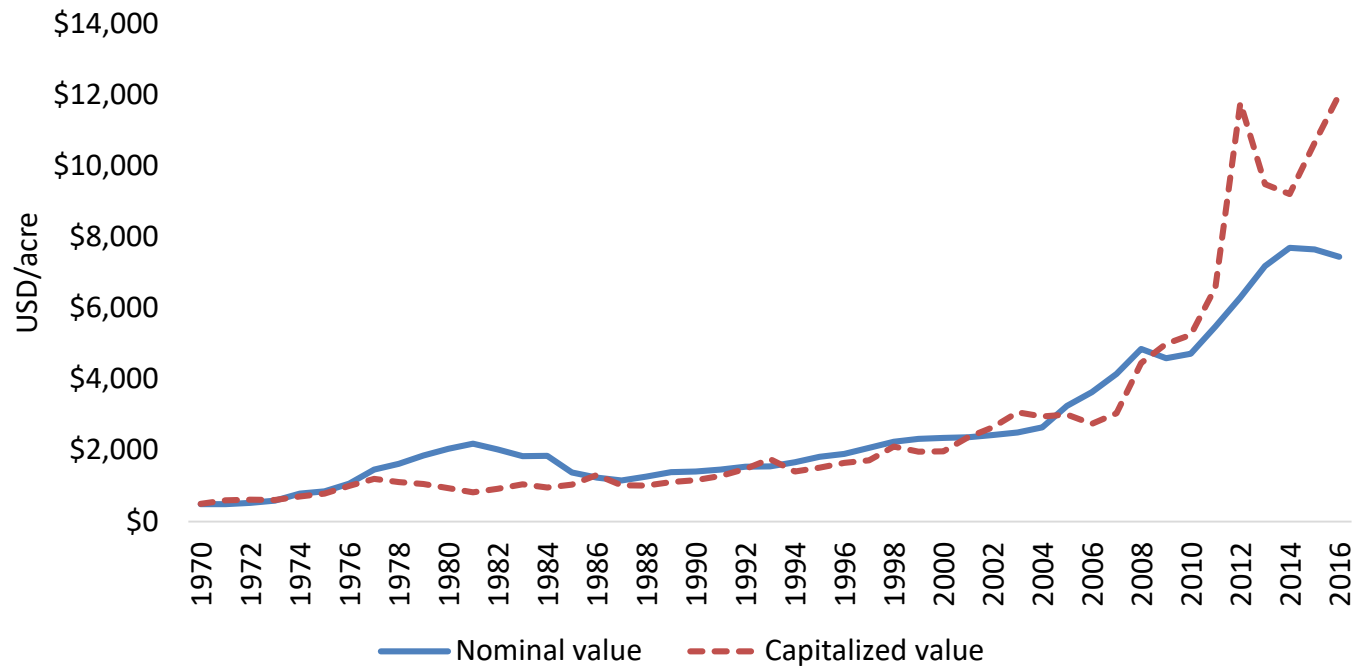


Annual and permanent cropland returns compared to other assets

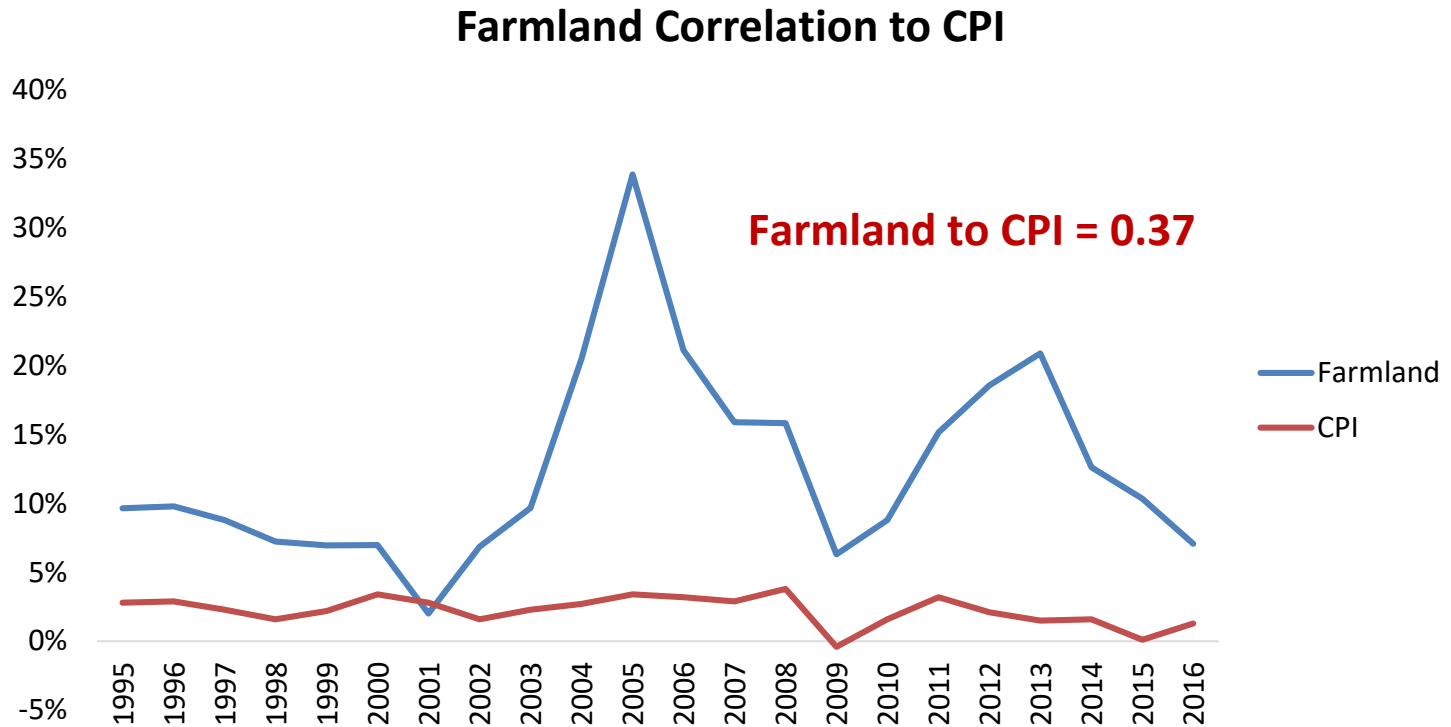


Farmland values low relative to capitalized value

**Illinois Cropland - Nominal and Capitalized Values
1970-2016**

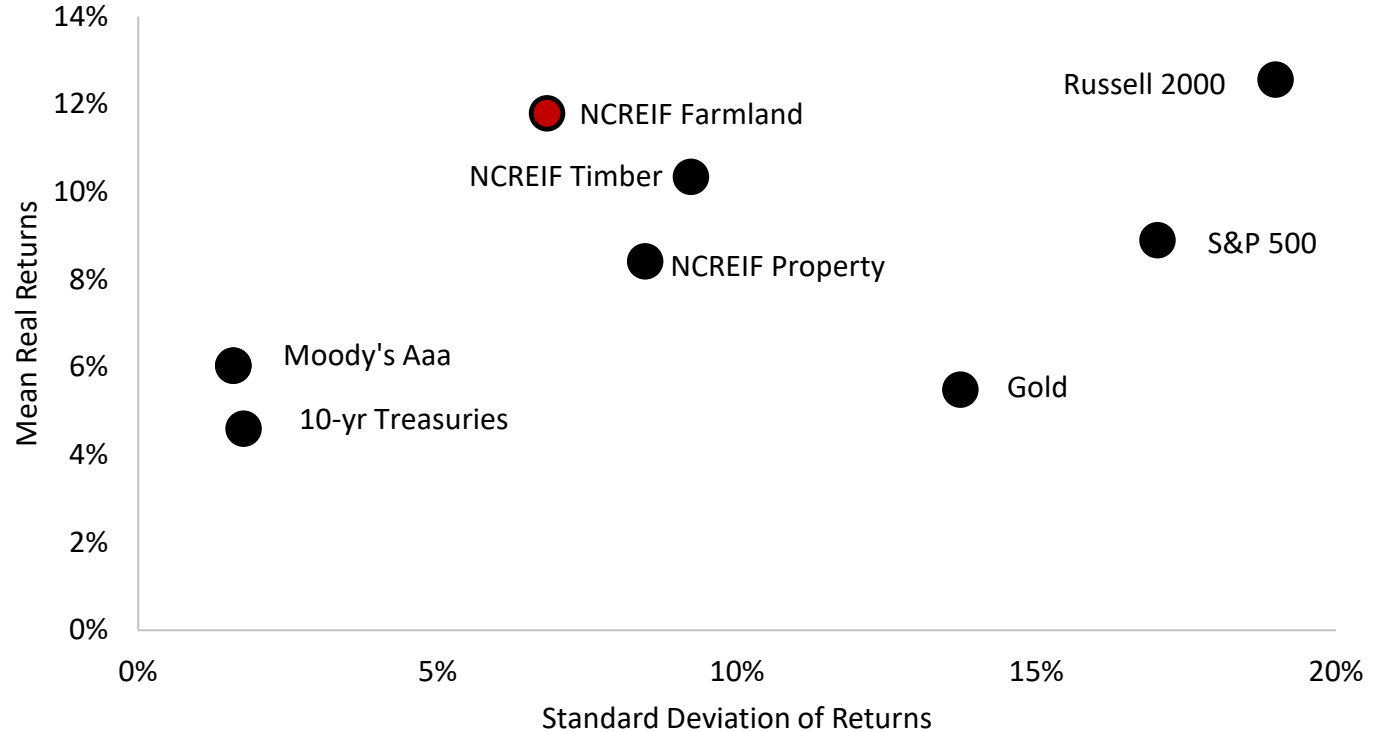


Farmland returns have been higher than CPI (inflation rate) – can mitigate impact of market volatility on returns



Returns on US farmland compared to other assets

Mean Return vs. Standard Deviation 1991-2016



TIAA farmland funds attract institutional investors across the globe

August 2015 - TIAA closes its largest agriculture investment fund to date with **\$3 billion in commitments**.

TIAA Global Asset Management - \$639 billion AUM(\$130 billion in alternatives.)*

Farmland Investment History

- Investing in agriculture since 2007
- Manages \$8 billion in farmland assets
- TCGA I- \$2 billion in commitments (2012)
- TCGA II- \$3 billion in commitments (2015)



Farmland Investment Strategy

- Invest in high-quality farmland, both permanent and row crops
- Geographic focus - North America, South America and Australia
- Investment strategy developed with majority-owned subsidiary Westchester Group, a farmland asset manager

Notable Investors

- AP2
- British Columbia Investment Management Corporation
- Caisse de dépôt et placement du Québec
- Greater Manchester Pension Fund
- New Mexico State Investment Council
- New York State Common Retirement Fund
- Saudi Aramco

**2015 values*

Paine Schwartz Partners closes fourth PE agribusiness investment fund

Early 2015 - Paine & Partners closes fourth fund - **\$893 million** in commitments. Fund is focused on the investment in global food and agribusiness companies – has acquired three portfolio companies.



Company Profile

- P&P and predecessor firm has managed over \$3.6 billion in assets
- Deployed over \$1 billion in capital in agribusiness sector over the last decade

Agriculture investment strategy

- Focus on upstream investment, particularly ag input companies to reduce cyclical and seasonal risks experienced by investing in underlying commodities
- Invest in agricultural technology and sustainability-focused companies to drive efficiency in food production

Representative Portfolio Companies

- **Suba Seeds**- Producer, packer, and distributor of specialty vegetable seeds
- **AgBiTech**- Australian producer of biological pest controls
- **Spearhead Int.**- Farming group with diversified crop and geographic exposure throughout Europe
- **Verdesian Life Sciences** - Investment platform focused on plant health and nutrition
- **ScanBio**- Norwegian producer of fish protein concentrate, meal, and oil from fish by-products

Notable Investors (Fund IV)

- Maine Public Employees' Retirement System
- Minnesota State Board of Investment
- New Mexico Public Employees' Retirement Association
- University of Texas Investment Management Company

Long-term fundamentals in food and agriculture are attracting investments from pension funds in Europe and Canada

Second Swedish National Pension Fund (AP2)	Canada Pension Plan Investment Board
<p>Fund type: Pension fund</p> <p>Country: Sweden</p> <p>AUM (Dec. 2015): SEK 300 bn (US\$35.7 bn)</p> <p>Investment breakdown:</p> <ul style="list-style-type: none"> • 44% Equities • 31% Fixed-income securities • 25% Alternative investments <p>Agriculture Investment Strategy:</p> <ul style="list-style-type: none"> • Agriculture represents 3.4% of AUM, approximately \$1.3 billion USD • Crop breakdown - 60% row crop, 30% permanent crops and 10% dairy • Geographic breakdown - 66% U.S., 23% Brazil and 11% Australia • Investment strategies carried out largely in collaboration with TIAA 	<p>Fund type: Pension fund</p> <p>Country: Canada</p> <p>AUM: CAD 278 bn (US\$217 bn)</p> <p>Investment breakdown:</p> <ul style="list-style-type: none"> • 52% Equities • 27% Fixed-income securities • 21% Alternative investments <p>Agriculture Investment Strategy:</p> <ul style="list-style-type: none"> • Directly invests/acquires farmland portfolios • Launched agricultural investment program in 2012 with geographic focus on U.S., Canada, Australia, New Zealand and Brazil • Purchase of 40% of commodity trader Glencore for \$2.5 billion USD (2016) • Acquired Assiniboia Farmland LP's Saskatchewan farmland fund



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U.S.- based pensions and endowments actively allocating capital to agricultural investments

Washington State Investment Board	University of Texas Investment Management Co.
<p>Fund type: Pension fund Country: United States AUM (Dec. 2015): \$106.9 bn. Investment breakdown:</p> <ul style="list-style-type: none"> • 36% Equities • 34% Fixed income • 30% Alternative investments <p>Agriculture Investment Strategy:</p> <ul style="list-style-type: none"> • \$50 million investment in ACM Permanent Crops LLC, a permanent crop fund • Investment Laguna Bay Agricultural Fund I (A\$250 million), focused on agriculture in Australia and NZ • \$300 million investment in Teays River, a US agricultural holding company operating in organic dairy, seed production, table grapes and row crops • \$100 million investment in UBS AgriVest, a US permanent and vegetable crop fund • \$250 million investment in Wood Creek Capital for the investment in US midstream ag assets 	<p>Fund type: Endowment/Operating Country: United States AUM: \$35.9 bn. Investment breakdown:</p> <ul style="list-style-type: none"> • 56% Equities • 24% Fixed income • 20% Alternative Investments <p>Agriculture Investment Strategy:</p> <ul style="list-style-type: none"> • Most active endowment fund in agriculture investment • Investment in Mandala Agribusiness Fund, a PE fund with a focus on the Indian market • Investment in Aqua Capital, a PE firm focused on midstream ag. investment in South America • \$100 million Investment in Paine & Partners Fund IV, a US PE firm focused on upstream and midstream ag • Investment in Black River, previously a Cargill subsidiary focused on the food sector, now independently-operated and known as Proterra

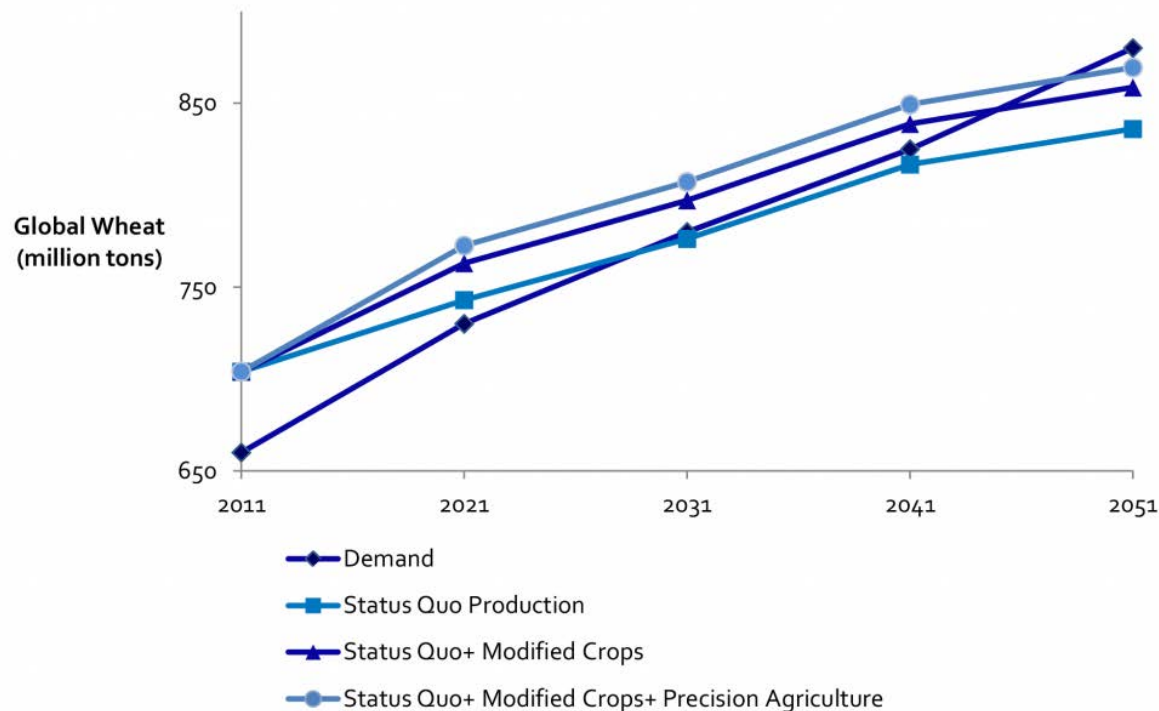


Examples of funds which have recently completed capital raises

<u>Fund</u>	<u>Sectoral Focus</u>	<u>Geography</u>
Arlon	Private Equity	North and South America
AMERRA Capital	PE + Financing	Global
Agriculture Capital Management	Farmland + Midstream	U.S.
Aqua Capital	PE - food and ag	South America
Blue Road	PE - supply chain	North and South America
Homestead	Farmland	U.S.
Hancock Agricultural Investment Group	Farmland	Global
International Farming Corporation	Farmland + AgTech	U.S.
Macquarie Infrastructure and Real Assets	Farmland	Australia, Brazil and the U.S.
Proterra Investment Partners	Farmland + PE	Global
Rabo Equity	PE	India
Tillridge Global Agribusiness	PE - midstream	North and South America

Improved productivity will be achieved by combining new “hardware” (seeds) and “software” (management practices)

C4 Wheat and Precision Agriculture Adoption Bridges the Gap between Wheat Supply and Demand through 2045



Source: Lux Research, Inc.
www.luxresearchinc.com

Digitization and miniaturization is accelerating change in agriculture



Alternative oilseeds and insects are becoming increasingly competitive protein sources in traditional plant protein markets

Soybeans



Camelina



Crickets



Pongamia



Historic acceleration in early stage food and ag tech investments

2014

- \$2.36 billion raised
- 264 deals
- 271 unique investors

2015

- \$4.6 billion raised
- 572 deals
- 672 unique investors



2016

- \$3.23 billion
- 508 deals

Sectors attracting investments

- Inputs/biologicals
- Precision ag
- Big data applications("smart farms")
- Novel feed/food ingredients
- Genetic prospecting(nexus of pharma/ag/food)

Source: Ag Funder's AgTech Investing Report – 1st Half 2016.

Key areas to track: impact of generic industry disruptors on subsectors of ag tech

- Ubiquitous connectivity and sensors
- Autonomous robotics
- Gene sequencing and rapid phenotyping
- Data capture, aggregation, analytics and prescriptions
- Novel materials
- Innovative business models

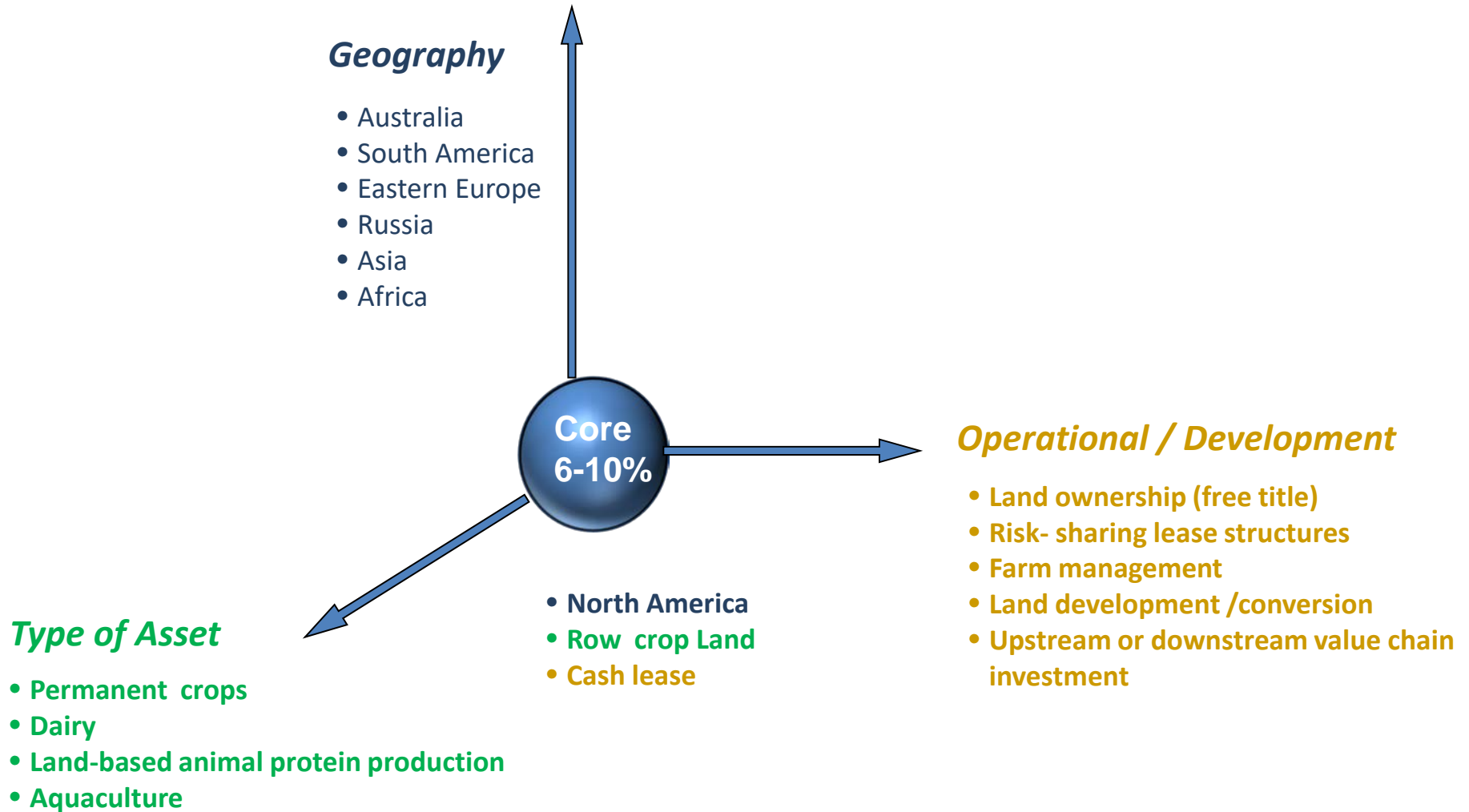


- Farm-2-Consumer
- Alternative Proteins
- Animal Nutrition and Health
- Food Safety & Traceability
- Smart Equipment & Hardware
- Decision Support Technology
- Food Commerce
- Food Tech

Trends in agricultural investing as it emerges as an asset class

- *Increasing tendency for large institutions such as pension funds to bring sectoral expertise in-house to pursue direct investments as opposed to investing in funds.*
- *Permanent crops and situations involving mix of real assets with exposure to operating risks attracting investments as investors seek higher returns.*
- *Sustainability and consumer concerns regarding quality become drivers for the adoption of new technologies and business models (ex. – indoor farming of leafy vegetables adjacent to large consumption markets).*
- *Frontier markets in Africa attracting capital.*
- *Argentina back in the game.*
- *Distressed assets in Brazil.*
- *Ag tech continues to attract capital.*

Example of sub-allocation framework for an ag portfolio



Informed decision making for global agricultural investing

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