

Fertilizer Outlook & Technology Conference

Fort Lauderdale, Florida November 16, 2016

Global Macroeconomics and The Ag Industry



Dr. Jim Budzynski, Managing Partner
MacroGain Partners

www.macrogain.com

Agenda





- Macroeconomics,
 Politics, &
 Populism
- Agriculture's Concurrent Corrections
- 3. Technology and the Future

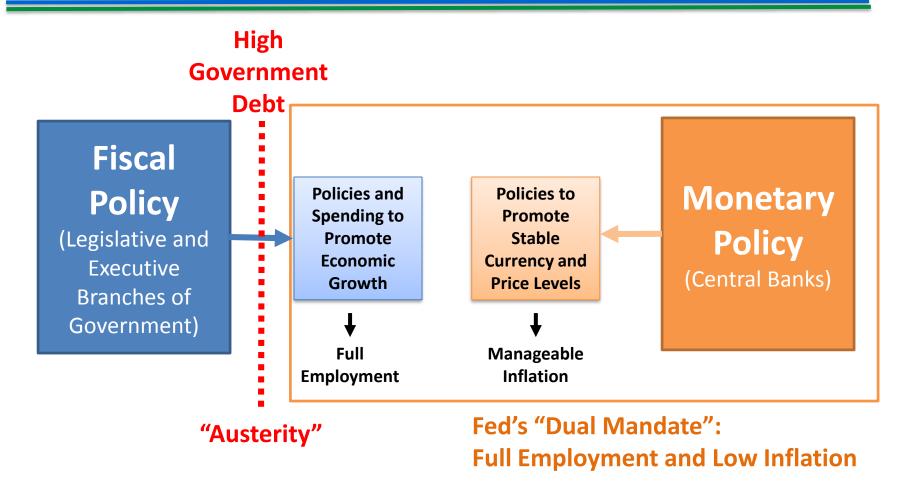
Historical Economic "Schools" Macro Gain Partners



Austrian Economics Keynesian Econo					
Government Role in Economy	None or Very LimitedFree Markets	 Substantial Government Intervention 			
Source of Capital	Savings	• Debt			
Use of Capital	Investment	• Consumption			
GDP Growth	 Determined by Productivity 	Manage to 3-5%			
Interest Rates	 Determined by Market (Supply/Demand) 	Lower to Drive GrowthRaise to Slow Inflation			
Inflation	Mild Deflation or Inflation OK	Drive Inflation to 2% +Deflation Very Bad			
Money Supply	 Sound Money (Gold Std) 	Fiat Currency			
Underperforming Companies	Creative Destruction (Failure)	• Bailouts			

Dysfunctional Government Driver of Fed Drift



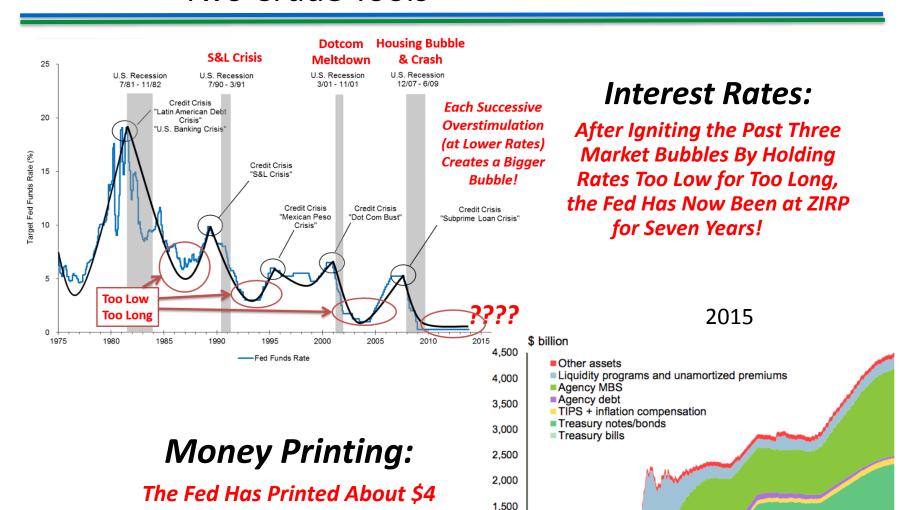


...But the Fed's only way of impacting the real economy is a tortuous path through Inflated asset prices and trickle down economics...

Fed: Manipulation Central Two Crude Tools

Trillion \$ Out of Thin Air Since 2008!



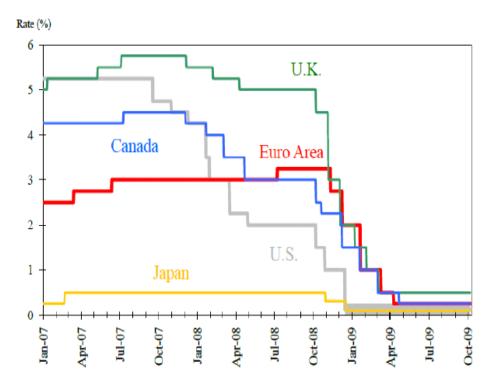


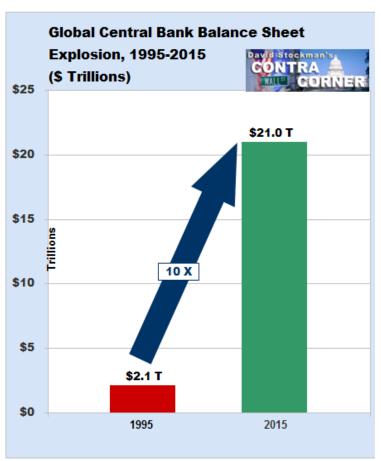
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Central Banks Globally Have Gone Nuts with Keynesian ZIRP and QE!



NEAR-ZERO POLICY RATES GLOBALLY

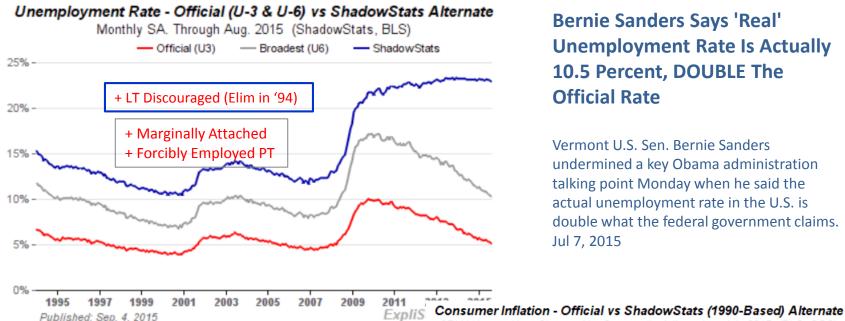




With the Fed Leading the Way, Global <u>Central Banks Have Printed Nearly</u> <u>\$20 Trillion</u> in the Past 20 Years and Driven Rates to Zero (and Below)!

So how is the Fed *really* doing on the "dual mandate"?

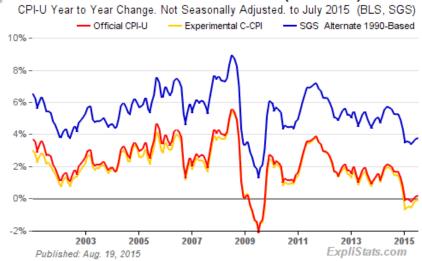




Bernie Sanders Says 'Real' Unemployment Rate Is Actually 10.5 Percent, DOUBLE The **Official Rate**

Vermont U.S. Sen. Bernie Sanders undermined a key Obama administration talking point Monday when he said the actual unemployment rate in the U.S. is double what the federal government claims. Jul 7, 2015

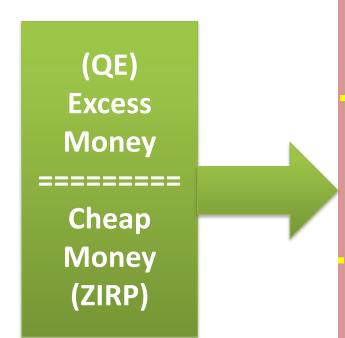
Job Growth Lower and Inflation Higher Than the Narrative!



In Addition to Not Working...



Short and Long Term Impacts of Fed Manipulation



- 1. Undermine Capitalist Models
- 2. Speculation

Short Term

- 3. Excessive Debt
- 4. Increased Risk Taking
- 5. Mal-investment

Medium Term

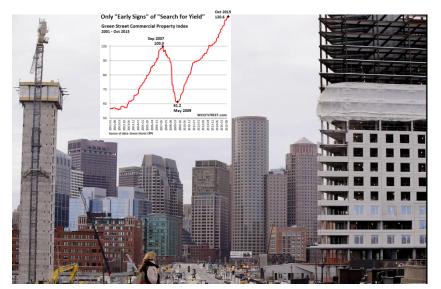
- 6. Financialization
- 7. Global Distortions
- 8. Wealth Redistribution

LongTerm

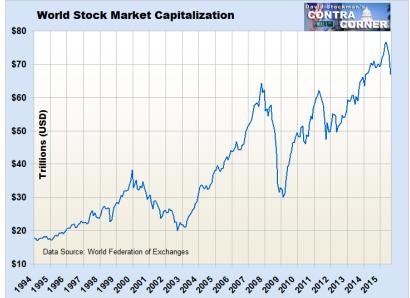
2. Asset Speculation



- 1. Record High US and Global Stock Prices
- Ultra Low Bond Yields, Especially High Yield
- 3. Real Estate Bubble





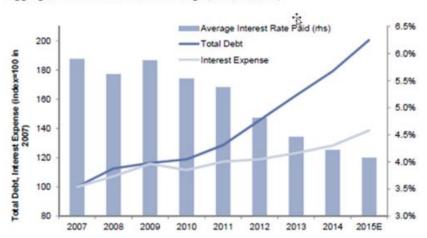


3. Excessive Debt (cont'd)



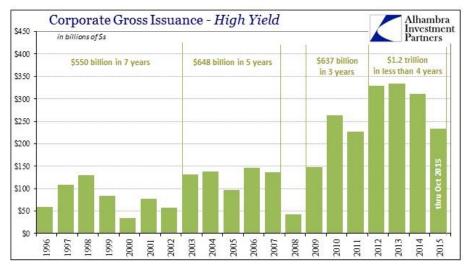
US Corporate Debt

Debt Levels have more than doubled vs. pre-crisis levels Aggregate for North America coverage (ex-Financials)



- Debt Levels Now <u>Double</u> the Pre-crisis in 2007
 - But Lower Interest Rates
- \$800 B + New Debt in 2015
 - 10% Dividend Recaps (PE)
- Debt Issued in Past Three Years (~\$4 T) is <u>3 Times</u> the Subprime Mortgage Debt in 2007

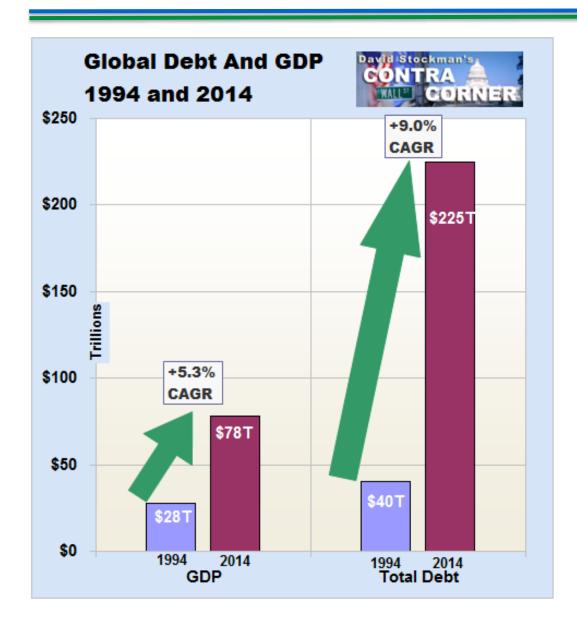
US High Yield Debt



- High Yield Debt Issuance Has Spiked to Over \$300 B/Year
- Leveraged Loans Have Skyrocketed from \$1 T to \$2.5T Since the Financial Crisis
- Gross Leverage Levels for Both Investment and High Yield Debt Has Reached Historical Highs

Global Debt to GDP Has Exploded!





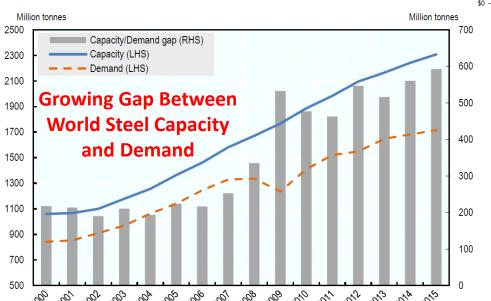
- Global Debt Levels
 Now 5.6 Times the
 Level of 1994
- Global Debt is Now
 260% of GDP

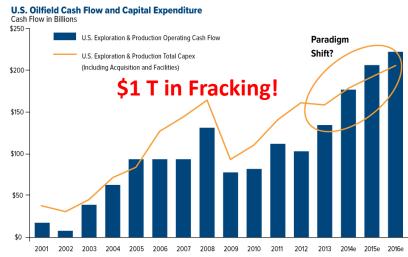
What could possibly go wrong?

5. Mal-investment



- ... mistaken investment in wrong lines of production, which inevitably lead to wasted capital and economic losses
 - "Wrong" in this sense means incorrect or mistaken from the point of view of the real long-term needs and demands of the economy
 - An investment that would not have been made if the market had not been distorted
- occurs because of unnecessary and counterproductive intervention in the free market, distorting price signals and misleading investors and entrepreneurs



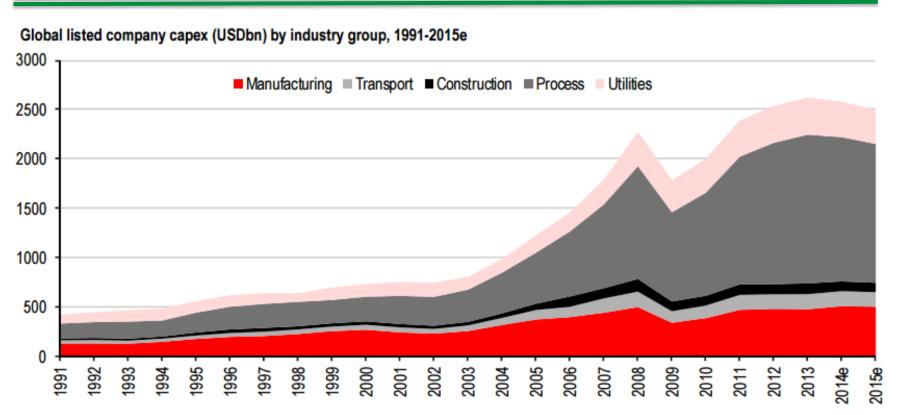


Source: Raymond James Research, Spears and Associates, U.S. Energy Information Administration, Bloomberg, U.S. Global Investors



Global CAPEX Depression?





Source: Thomson Reuters Datastream

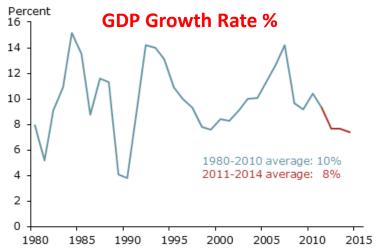
- Global Non-Miner CAPEX Typically Averaged \$500-750 B per Year
- Cheap Credit Helped Fuel a Bubble to Over \$2.5 T Per Year
- Global Excess Capacity Could Take Many Years to Unwind
- Global Miners: \$20 B (2004) => \$130 B (2013); Future ???

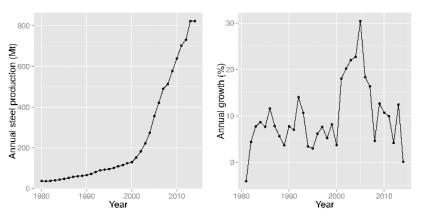
China's Incredible Growth Story











Chinese Steel Production

China's Commodity Appetite



CHINA CONSUMES MIND-BOGGLING AMOUNTS OF RAW MATERIALS

...and that's why slowing growth may continue to cause headaches for commodity producers



- China 13% of Global Economy, 20% of Population
- visualcapitalist.com

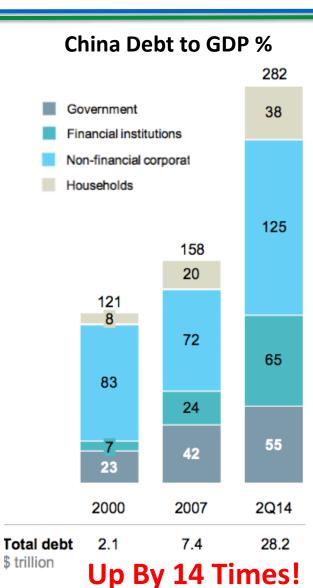


- Use 40-55% Industrial Metals, 50% Coal, 60% Concrete
- Use 15-30% of Most Ag Commodities

Chinese Debt Crisis

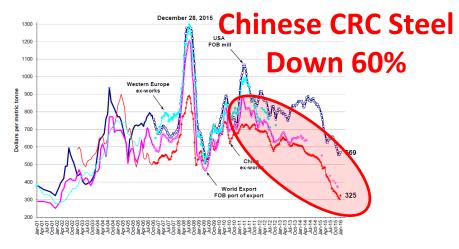






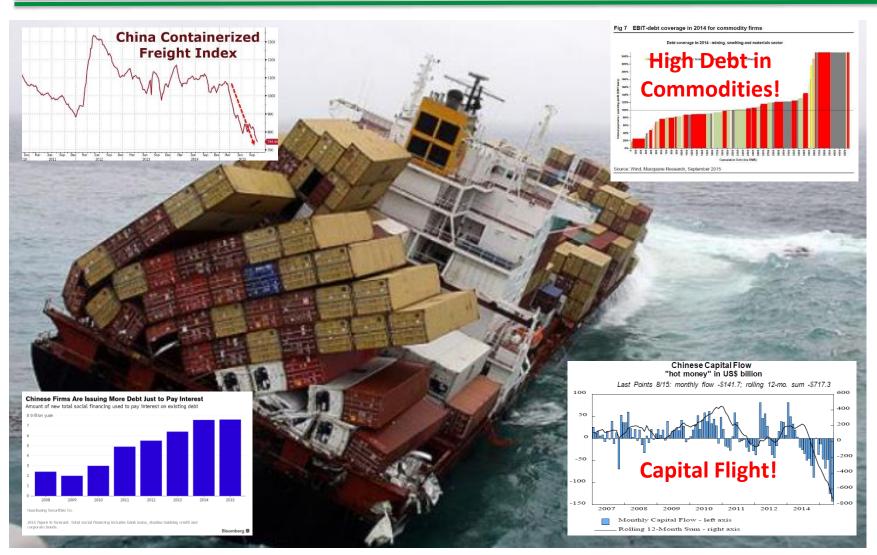






Hard Landing in China?



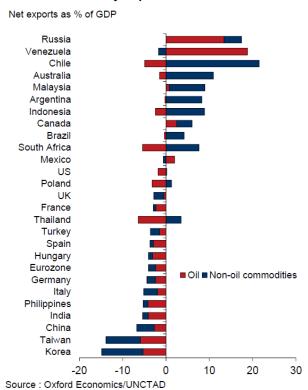


New Debt for Interest!

China Ripple Effect...?



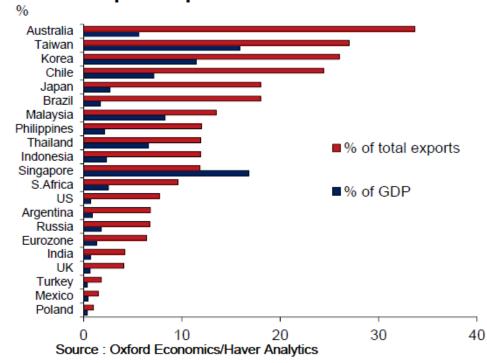
World: Commodity exposure

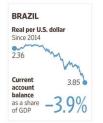


Many Countries Impacted by Commodity Exports

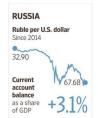
- 7 Countries >10% GDP
- High China Exposure
 - 12 Countries >10% Exports
 - 7 Countries > 5% GDP

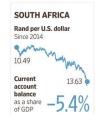
World: Export dependence on China

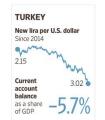








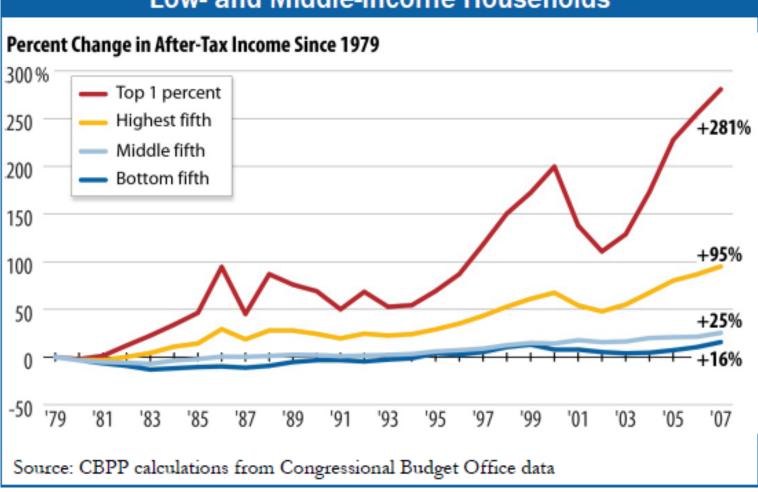




8. Wealth Redistribution

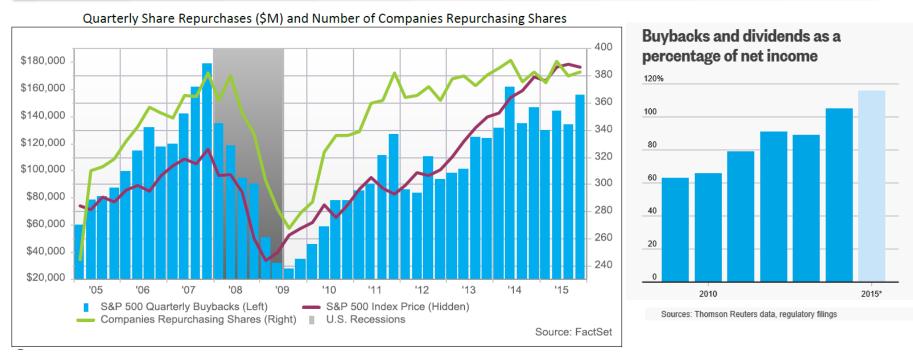


Income Gains at the Top Dwarf Those of Low- and Middle-Income Households



Share Buybacks: Goosing Earnings Per Share (and Management Bonuses)





- There are Two Ways to Increase EPS (Earnings Per Share)
 - 1. Earn More
 - 2. Buy Shares Back
- 380/500 (76%) of S&P Companies Are Buying Back Shares
 - \$1.2 T Per Year
 - EPS (and Stock Prices) Rising
- Buybacks and Dividends Now Represent 110% of Net Income

2016 Election





Hillary (and Bill)



The Donald

A Philosophical Matrix



Socialism

Government Must
Create the
Environment for
Economic Growth
and Personal and
Societal Prosperity

Corporatism

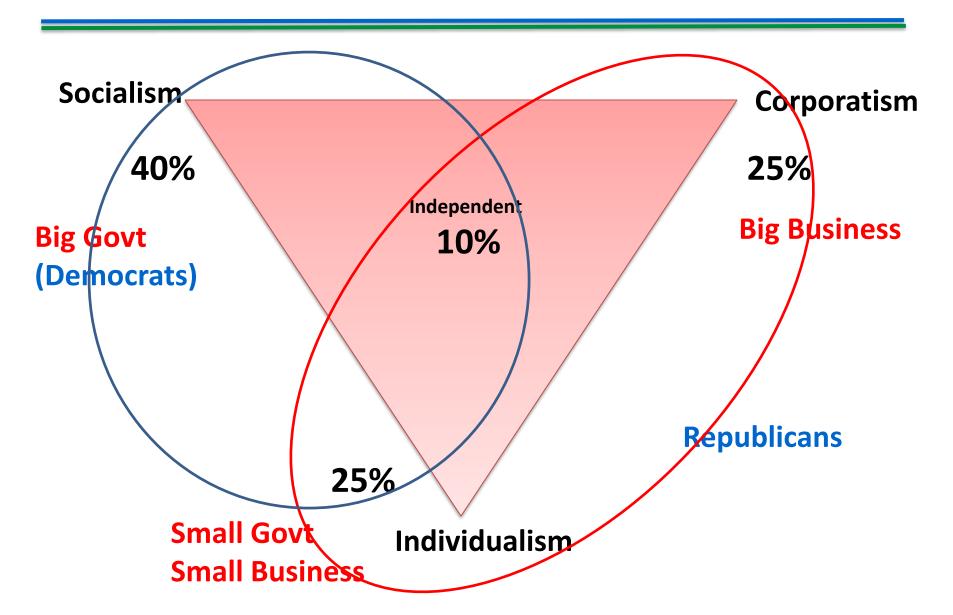
Businesses Innovating
and Unencumbered by
Excessive Regulation
or Taxes Will Create
Profits (and Hence
Prosperity)

Individualism

Individuals and Entrepreneurial Enterprises Seeking Personal Success in a Competitive Market Are the Keys to Prosperity

Traditional US Political Matrix





Grand Bargain?



Federal Reserve

Big Banks

Socialism

Major Laws/Actions

- Bankruptcy Law Charges 10/17/05
- TARP 10/3/08
- Fed: ZIRP (12/08 to 12/15)
- Fed: QE 1, 2, 3 (2009-2014)
- ACA 3/23/10

Corporatism

Individualism

Grand Bargain Outcomes



Socialists Got

- Obamacare (Medicaid Expansion)
- Debt Ceiling Relief
- Welfare Expansion

Corporatists Got

- Fed Bailouts
- QE 1, 2, 3 (Stock Market Triples)
- Zero Interest Money for Stock Buybacks and M&A
- Best Congress Money Can Buy

Individualists Got

- No Interest on Savings
- Tax Increases (To Pay for Above)
- Declining Real Wages
- High Deductible ACA Policies
- Job Elimination (Closures, Buyouts)

Keynesian Outcomes



Winners

- Top 10%
- Stock & Bond Investors
- Private Equity & VC
- Corporate Management
- Technology Companies
- "New" Energy
- Progressives/Cities

Losers

- Bottom 90%
- Working Class
- Savers
- Pensions
- Entrepreneurs
- Manufacturing Workers
- "Old" Energy
- Conservatives/Rural

November 2016 Was a Repudiation of the Recent Keynesian Choices for Winners and Losers!

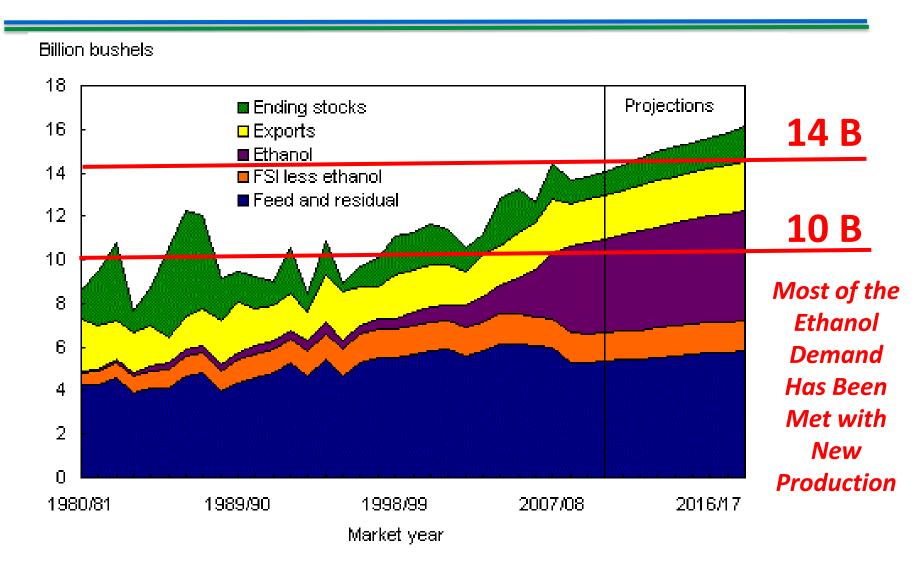
Agriculture's Position





Corn Utilization Ethanol Impact

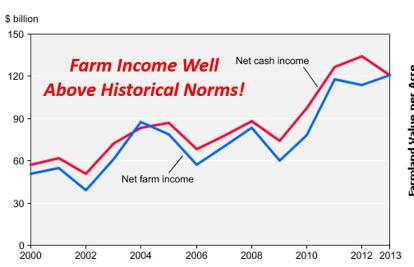




Source: *USDA Agricultural Projections to 2018,* February 2009. USDA, Economic Research Service.

Ethanol Boom Impacts





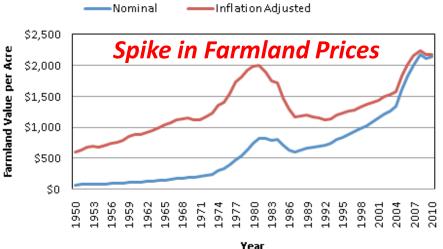
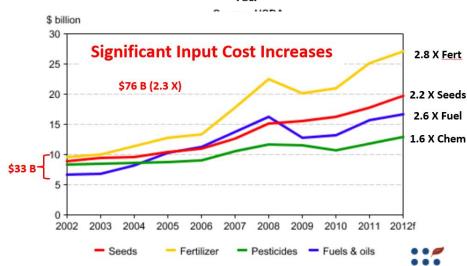


Table 2. History of Cash Rents for Mid 1/3 of Cash Rent Leases.

Land Class¹

Year	Exc	ellent	Good	Average	Fair			
	_	\$ per acre						
2007		183	164	144	120			
2008		241	207	172	138			
2009		267	221	187	155			
2010		268	231	189	156			
2011		319	271	220	183			
2012		379	331	270	218			
2013		396	339	285	235			

Doubling of Cash Rent

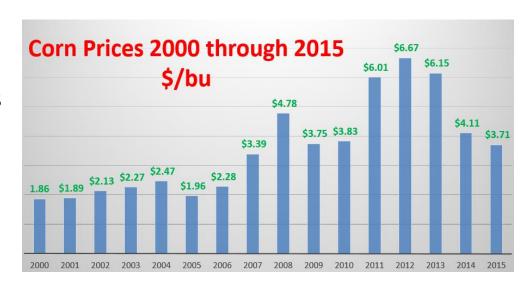


Source: Economic Research Service, USDA. Data as of August 28, 2012.

Ethanol Hangover



- Supply Expansion
 - More Corn Acres
 - Yield Enhancement Focus
 - Foreign Production
- Demand Destruction
 - Ethanol Plant Shutdowns
 - Livestock Liquidation
 - Grain Export Drop
- Higher Asset Prices, CODB
 - Higher Land Prices
 - Input Volume/Prices Up
 - Equipment Purchases Up



"The Cure for High Prices is High Prices"

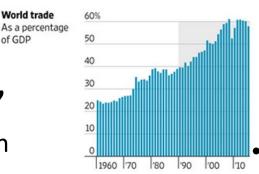
Secular Downturn?

of GDP



1995-2007 "Globalization"

- Stability and Growth
- **Increased Trade**
- Manufacturing and **Service Outsourcing**
- Rising Living **Standards**
- Rising Incomes
- Peace and Harmony
- Inflation
- Global Food Demand Growth



2008-2015 **Transition**

Collapse of Government **Finance Bubble**

"Fasten your seat belt"

World Bank

~2016-2020 "De-Globalization"?

- Instability
- **Decreased Trade**
- **Currency Wars**
- Manufacturing and **Services Insourcing**
- **Declining Incomes**
- **Declining Living Standards**
- **Conflict and Disharmony**
- Deflation
- Refugees and Migration
- **Moderating Food Demand** Growth

Technology





Creative Destruction





In <u>Hinduism</u>, the god

<u>Shiva</u> is simultaneously destroyer and creator; source of the Western notion of "creative destruction"

"The most significant advances in economies are often accompanied by a process of "creative destruction", which shifts profit pools, rearranges industry structures, and replaces incumbent businesses"

Joseph Schumpeter early 20th century economist

Technology Has a Unique Role to Play in Powering Growth and Transforming Economies

Which technologies matter?



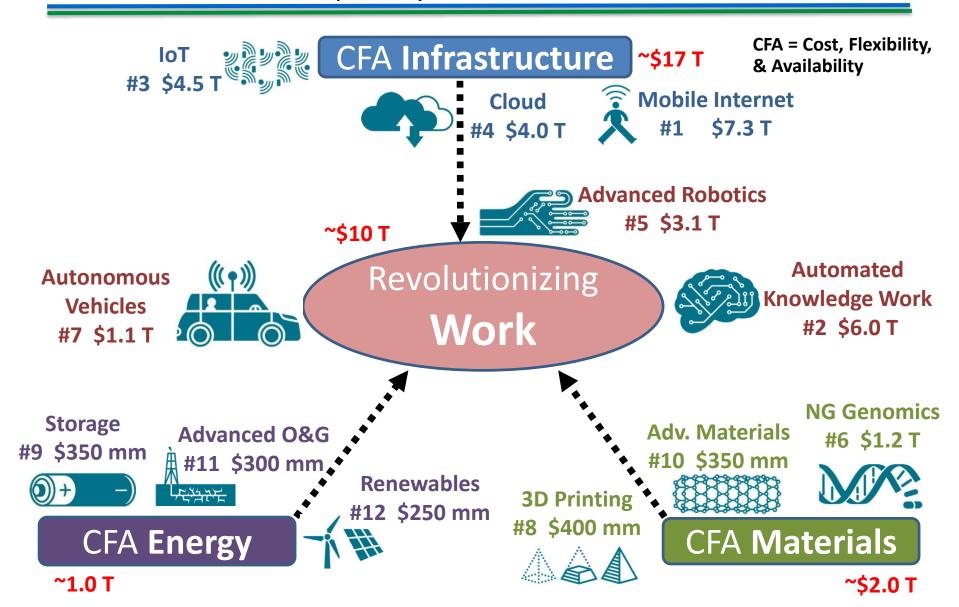
- 1. High Rate of Technology Change
 - Step Changes in Productivity
- 2. Broad Potential Scope of Impact
 - Impact Many Companies and Industries
- 3. Large Economic Value Impact
 - Profit Pools, GDP, Capex
 Obsolescence
- 4. Potential for Disruptive Impact
 - Dramatically Change Status Quo



Adapted from: McKinsey Global Institute, May 2013: Disruptive Technologies: Advances That Will Transform Life, Business, and the Global Economy

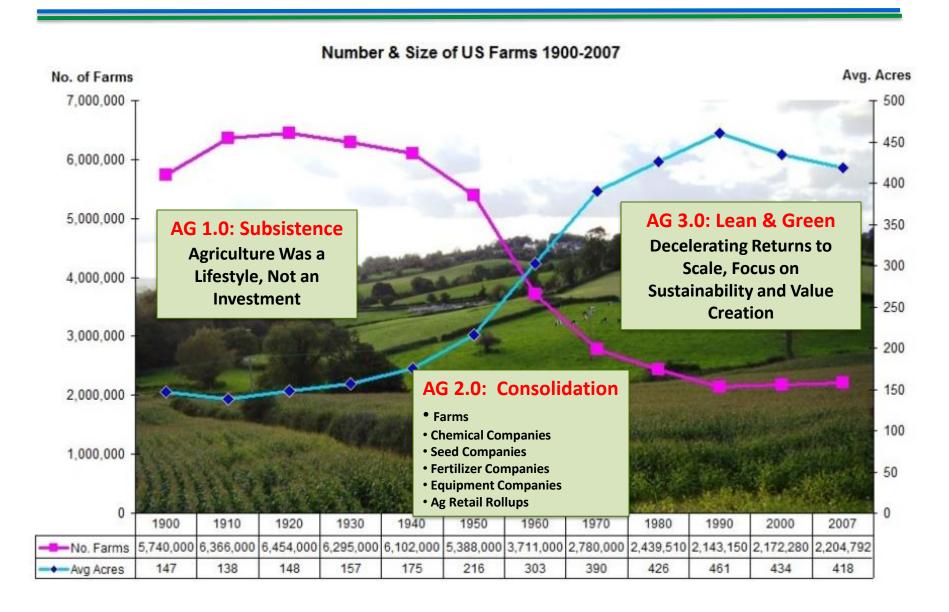
Top 12 Disruptive Technologies Macro Gain Partners

Annual Impact by 2025



U.S. Farm Consolidation Timeline

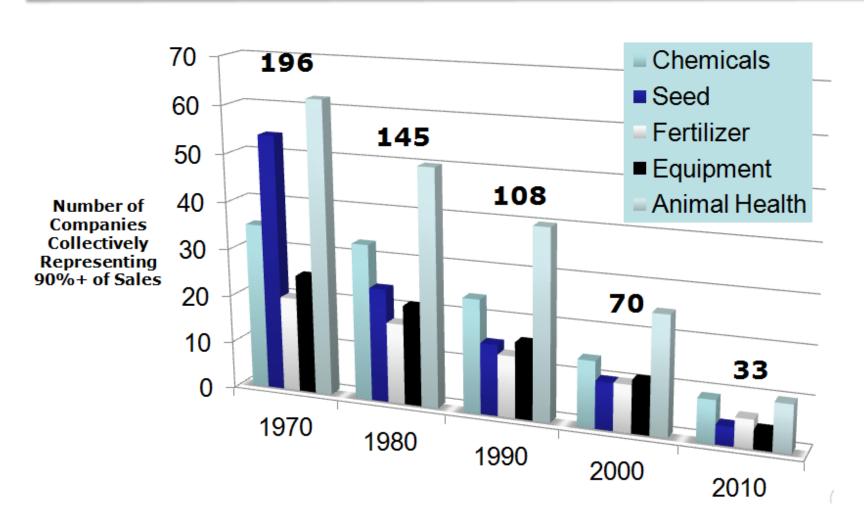




Structural Changes



The "Ag Rollup" Is Largely Over



Massive Consolidation at Input Supplier Level!

IT Platform Convergence











- Search
- Cloud
- Smartphone
- Tablets
- PCs
- Music

Competition on <u>Integrated Platform</u>, Not Individual Products!

Disruptive Technology Meets a Mature U.S. Ag Industry



Crop Nutrition

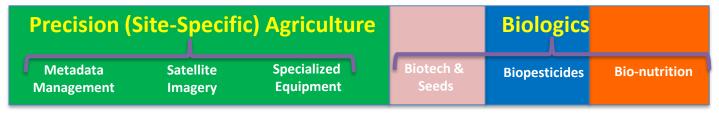
Crop Protection

Precision Ag and Equipment

Seeds and Biotechnology

Suppliers Seek
Growth by Acquiring
Technologies Which
Enable Integrated
Solutions for Powerful
Customers





"Productivity Convergence" Technology Integration

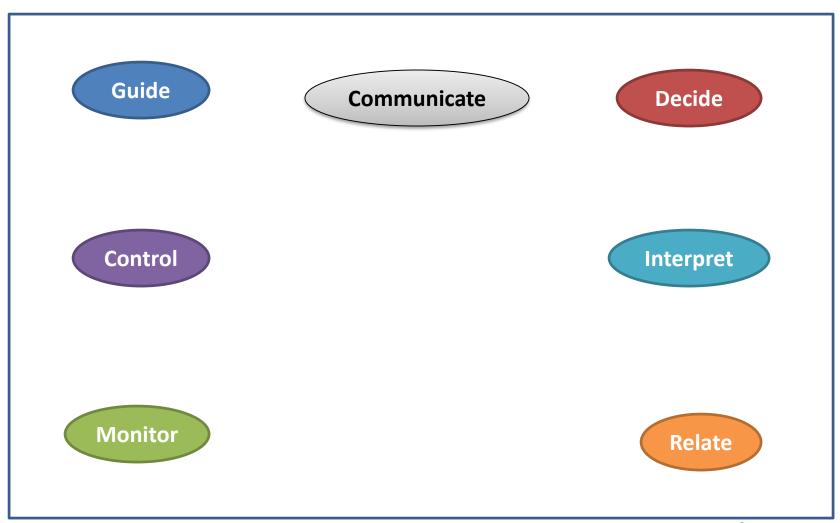
Precision Ag Systems



Task	Examples
Guidance Systems	GPSAutosteer
Control Systems	 VRT Planting and Population VRT Fertilizers, Lime, Pesticides Robotics
Monitoring Systems	 Yield and Quality Sensors Drones EC, Moisture and Nutrient Monitors Soil Samplers / Testing
Spatial Relationship Systems	 Satellite Imagery GIS Databases
Interpretation Systems	 Agronomic Response Curves Correlation Development Statistical Analysis
Decision Support Systems	 Recommendations: Crops/Population/Variety/Depth Nutrient Rates/Timing/Forms Crop Protection Harvesting or Water Management
Communication Systems	 Remote Access/Cloud Systems Smartphones and Apps Tablets and Apps Asset Tracking

Task Model of Precision Ag





Company Ecosystem



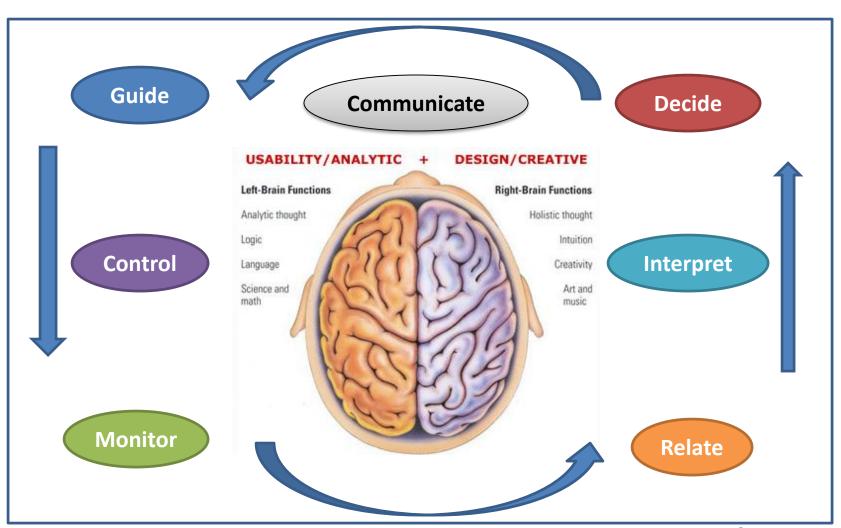






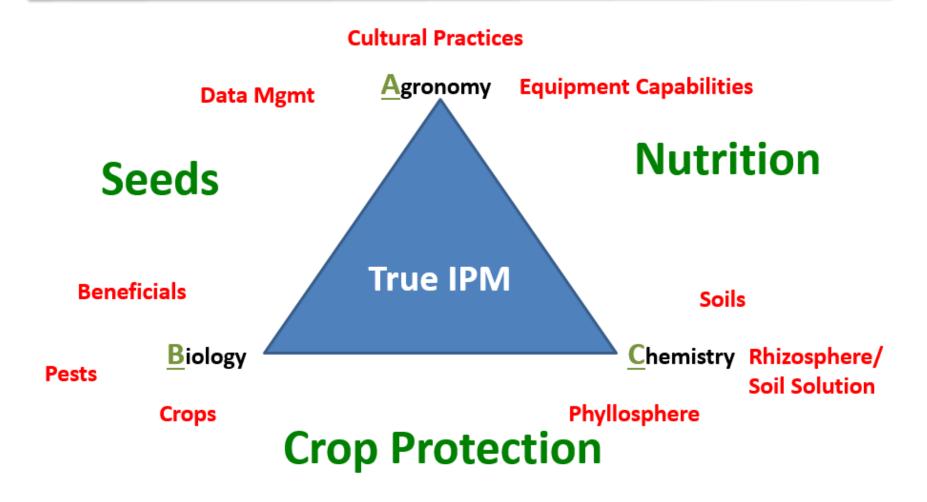
Left Brain / Right Brain





The Integration Imperative Focus on the A, B, Cs





Agricultural Technology Opportunity - Enabling



Infrastructure

- Real Time Monitoring and Detection to Capture Data Gap Productivity Losses
- Sensors, UAVs, MEMS based Solutions
- Nutrient Sensors

Materials

- Next Generation Genomic Solutions
- Nanoparticle Technology
- Phase Transfer Catalysts

Energy

- On Farm Renewables
- Energy Storage

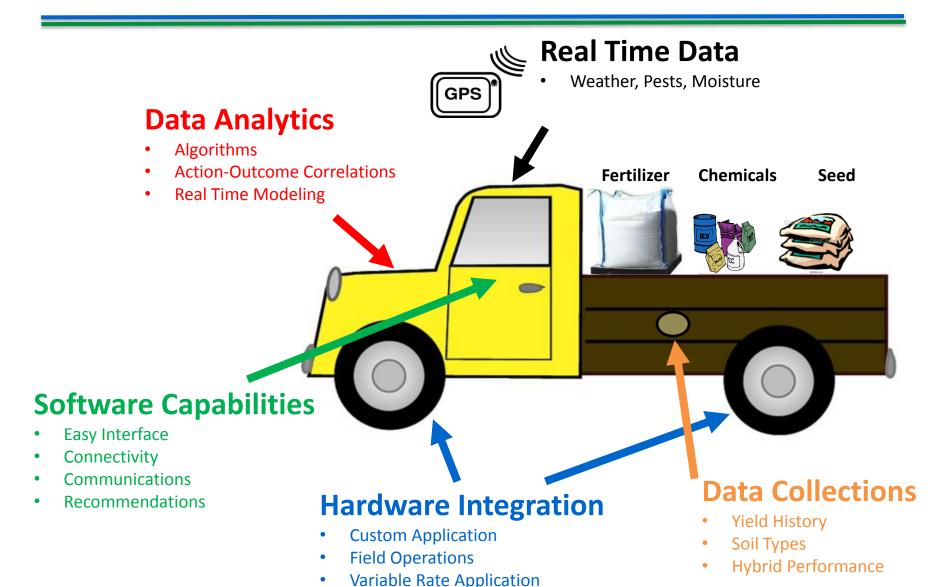
Agricultural Technology Opportunity – Revolutionizing Work



- Autonomous Vehicles
 - Field Level Drone Technology
- Advanced Robotics
 - Machine Vision Enabled Sprayers, Planters, Tillage
- Automated Knowledge Work
 - Enhanced Recommendation Data (Right Brain) to Catch Up with Left Brain Application Sophistication
 - Optimized Rates (Up and Down)
 - Optimized Timing (Relative to Crop and/or Stressors)
 - Variable Input Adjustments for Productivity (Chemicals, fertilizer, Biologics)
 - Prescriptive Weed, Disease, or Insect Control (Based on Quantified Economic Yield Impact)
 - Seed Selection and Optimization Based on Datasets w/o Reference to Supplier
 - MEY for Conditions
 - Managing Progressively Larger and More Complex Datasets
 - Models for Nutrient Interaction and Optimization
 - Regional Benchmarking
 - Whole Farm ERP Systems to Optimize Productivity and Improve Input Price/Terms Negotiation
 - Enhanced Crop Insurance and Risk Mitigation Tools

"Building the Truck"





Summary of Key Thoughts



Globalization is in the early stages of a very turbulent period

- U.S. political dysfunction and Keynesian monetary policy is a major cause
- Populism will make this particularly dangerous

2. U.S. agriculture is experiencing a concurrent downturn

- cyclical post-ethanol correction and a secular downturn
- Keynesian monetary policy will make the recovery much slower and significant consolidation will occur

3. Technology will drive the next big growth phase in the U.S. economy

- Agriculture will benefit greatly from several of these trends
- Training, especially Right Brain, will be critical

Epilogue – Success?



