Biofuels Analysis: Impacts on levels and volatility of world market prices

William H. Meyers
Professor of Agricultural Economics and
Co-Director, FAPRI
with Seth Meyer and Pat Westhoff

1st FAO Technical Consultation on Bioenergy and Food Security
16-18 April 2007

About FAPRI

- Funding from US and international sources to analyze agricultural markets and alternative policies
- Additional work on
  - Commodity Transportation
  - Biofuels
  - Farm Level Impact Analysis
  - Environmental

The Bottom Line

- Not clear that potential for biofuels will be significant in energy markets
- BUT very clear that biofuels already have big impact on agricultural markets
- We assess the level and volatility impacts under current technology and policy paths

Baseline Assumptions

- Constant Policy Baseline
- Assume continuation of
  - $0.51 per gallon ethanol tax credit
  - $0.54 per gallon import tariff on ethanol
  - $1.00 per gallon biodiesel tax credit

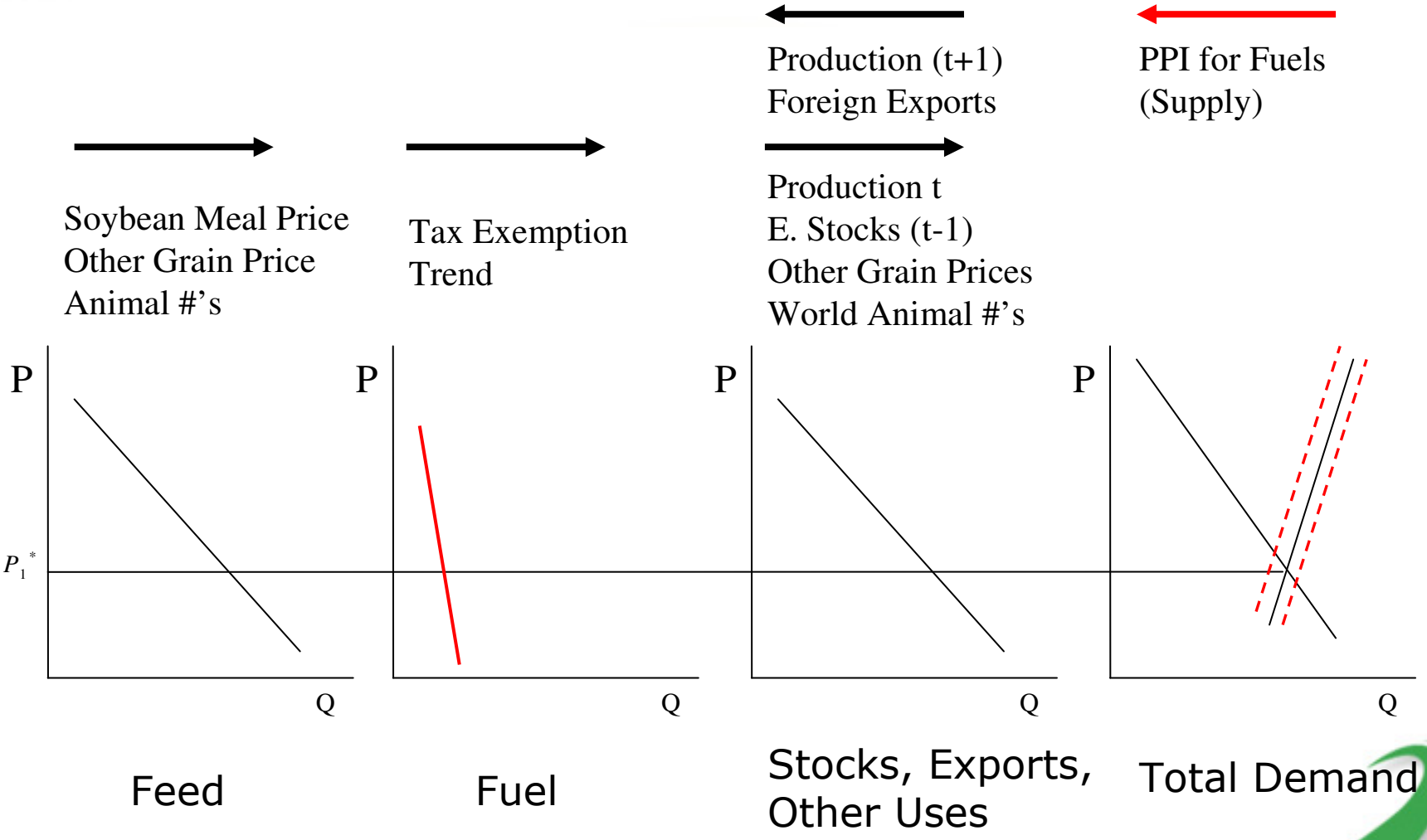
Baseline Assumptions

- Dry mill process (currently most common)
  - 2.73 gallons ethanol/bushel of corn in 2006 growing to 2.88 gallons ethanol/bushel of corn in 2016.
  - 17 pounds of distillers grains/bushel of corn
- Wet mill process
  - 2.69 gallons ethanol/bushel of corn in 2006 growing to 2.76 gallons ethanol/bushel of corn in 2016.
  - 14 pounds of corn gluten feed and meal/bushel of corn
  - 1.6 pounds of corn oil/bushel of corn

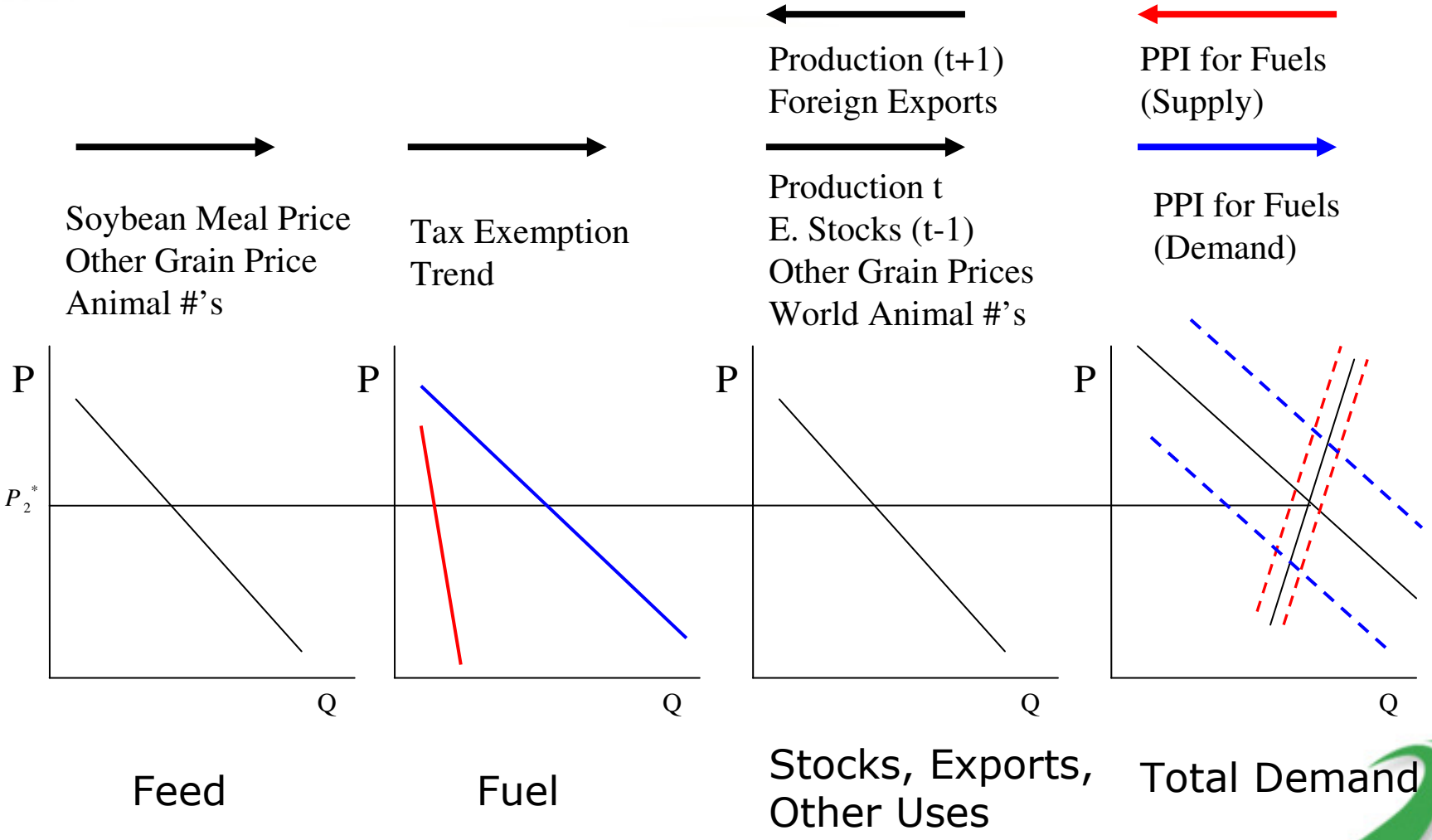
Uncertainty and Volatility

- Uncertainty introduced through:
  - Yields
  - Trade
  - Domestic Demand
  - Input Price Indices
- Volatility looks at the nature of the relationship between variables.

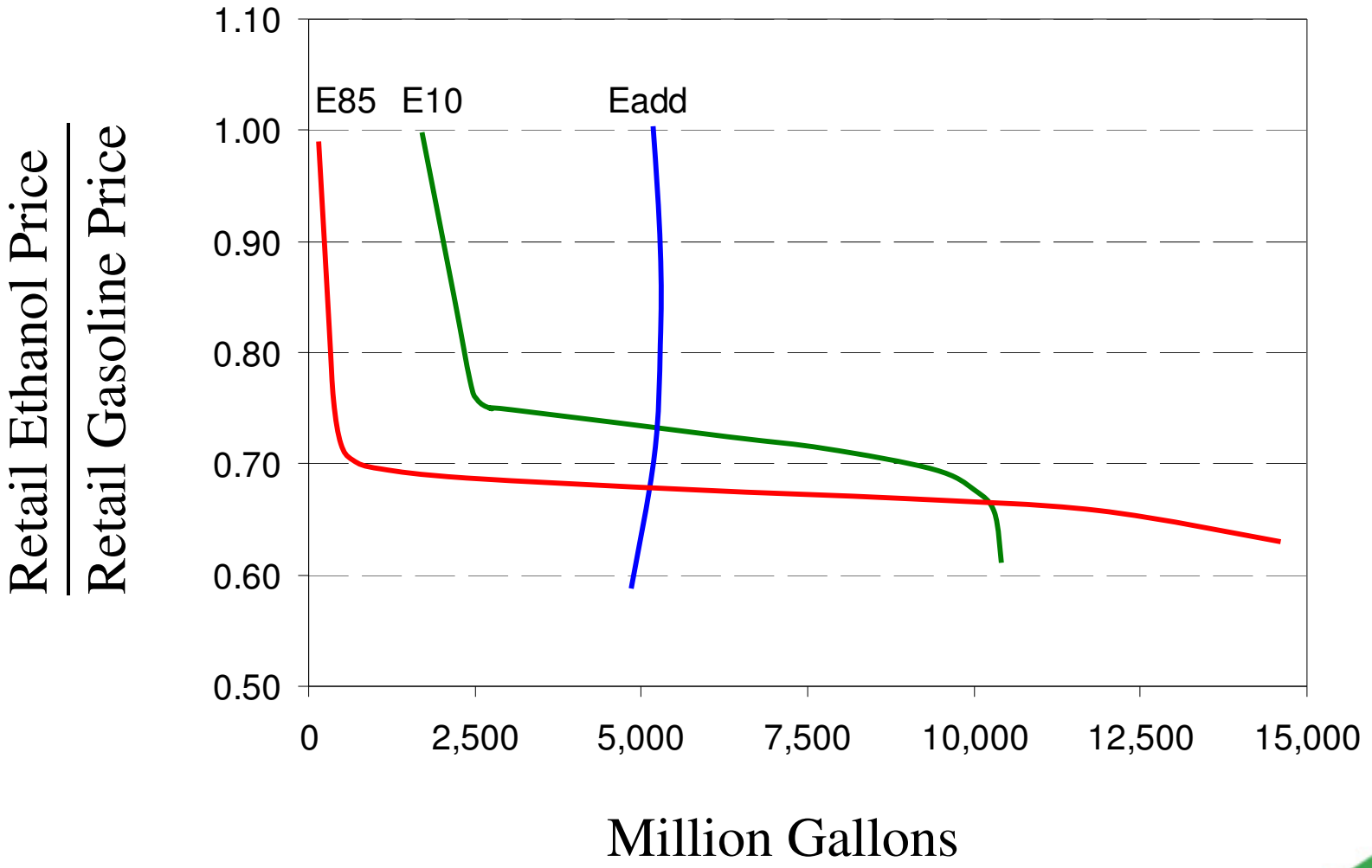
Biofuels Increasing Volatility?



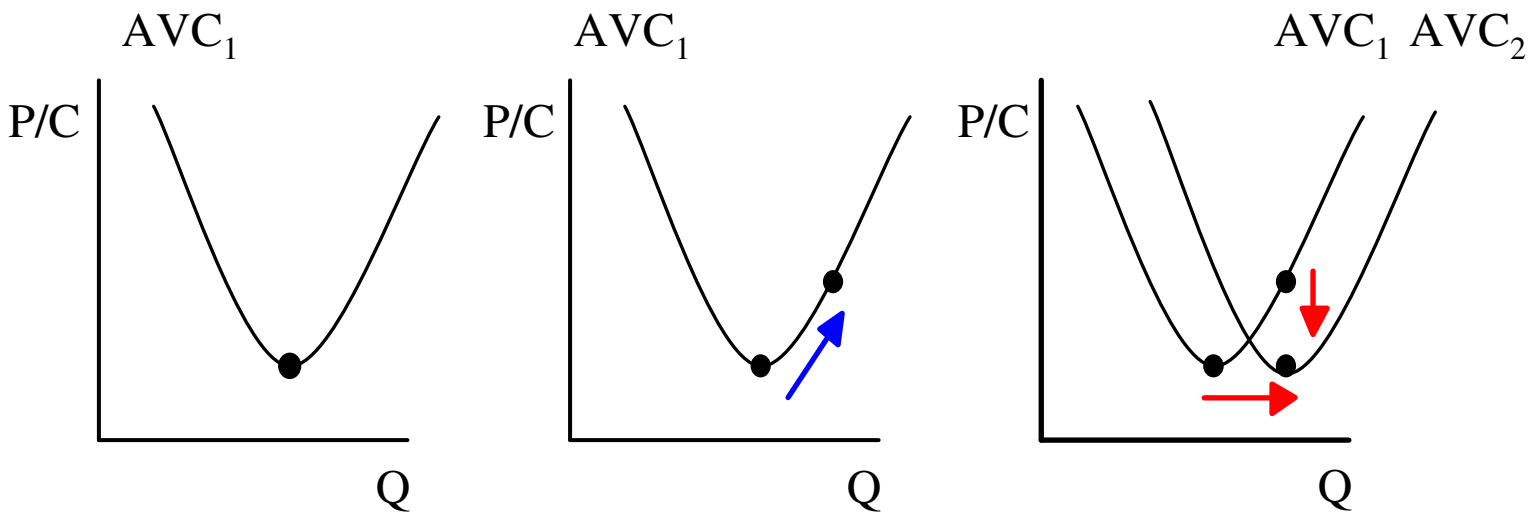
Biofuels Increasing Volatility?



Ethanol Demand by Use

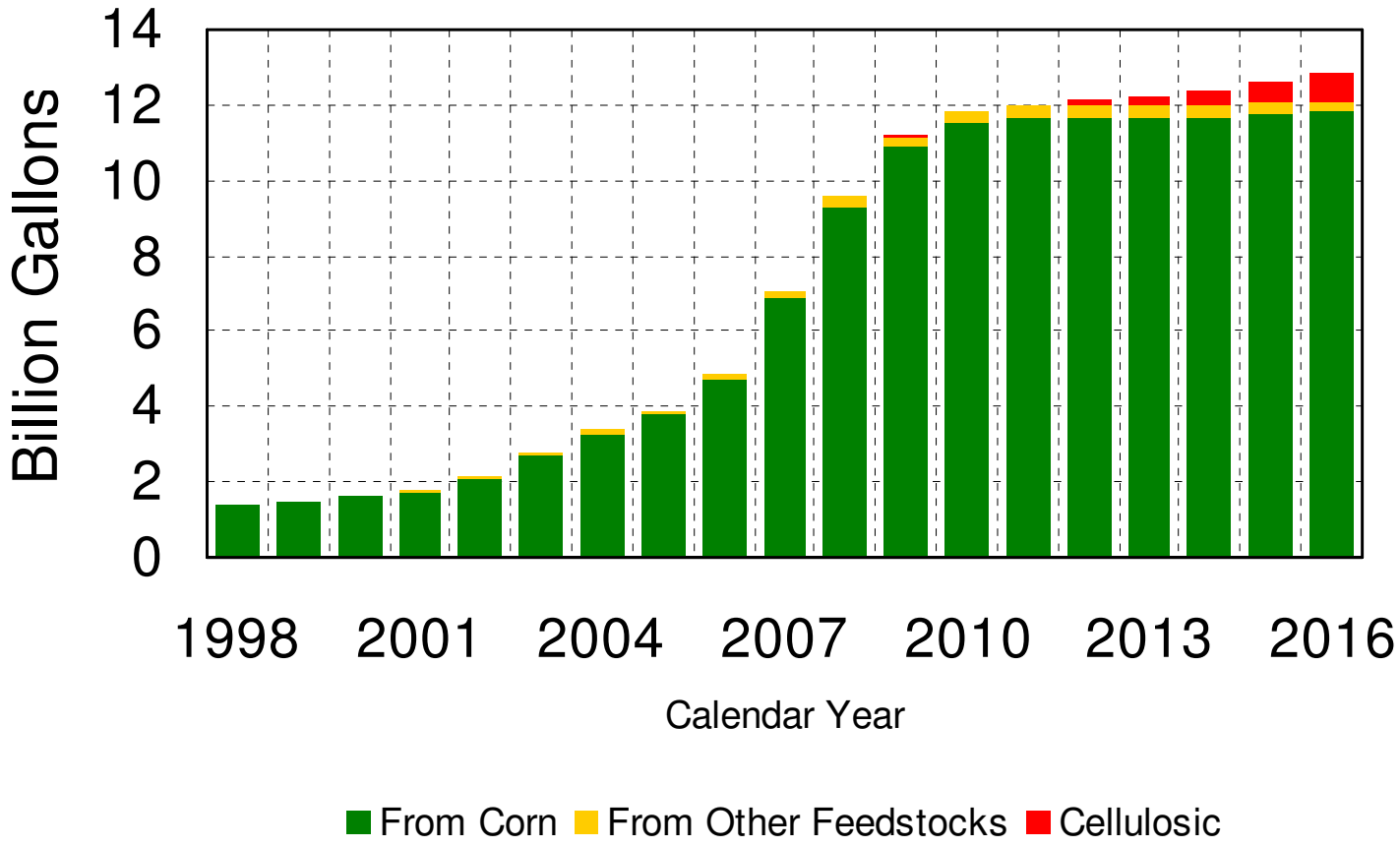


Capacity and Utilization Behavior

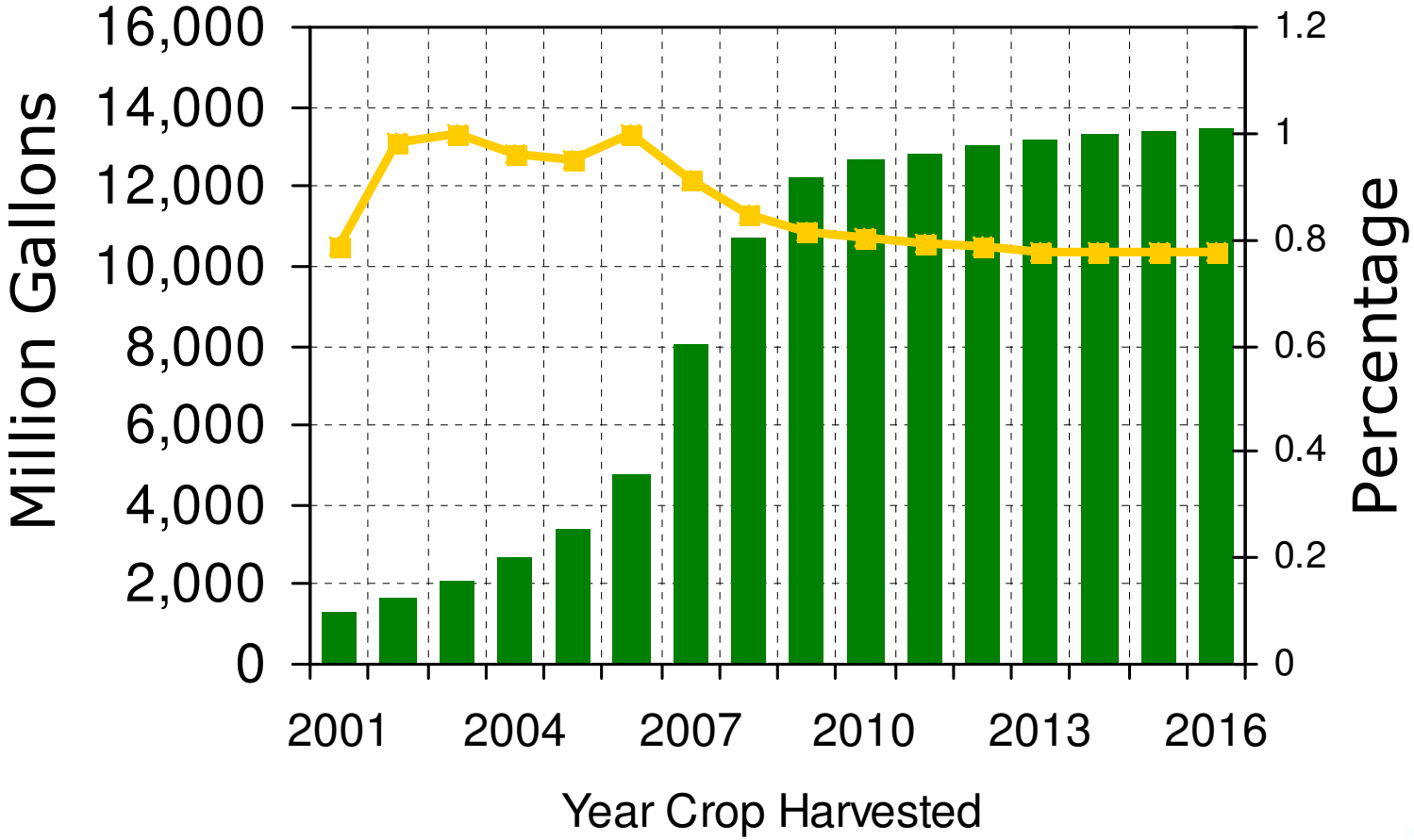


Capacity largely determined in previous periods
Utilization rate determined completely in current period

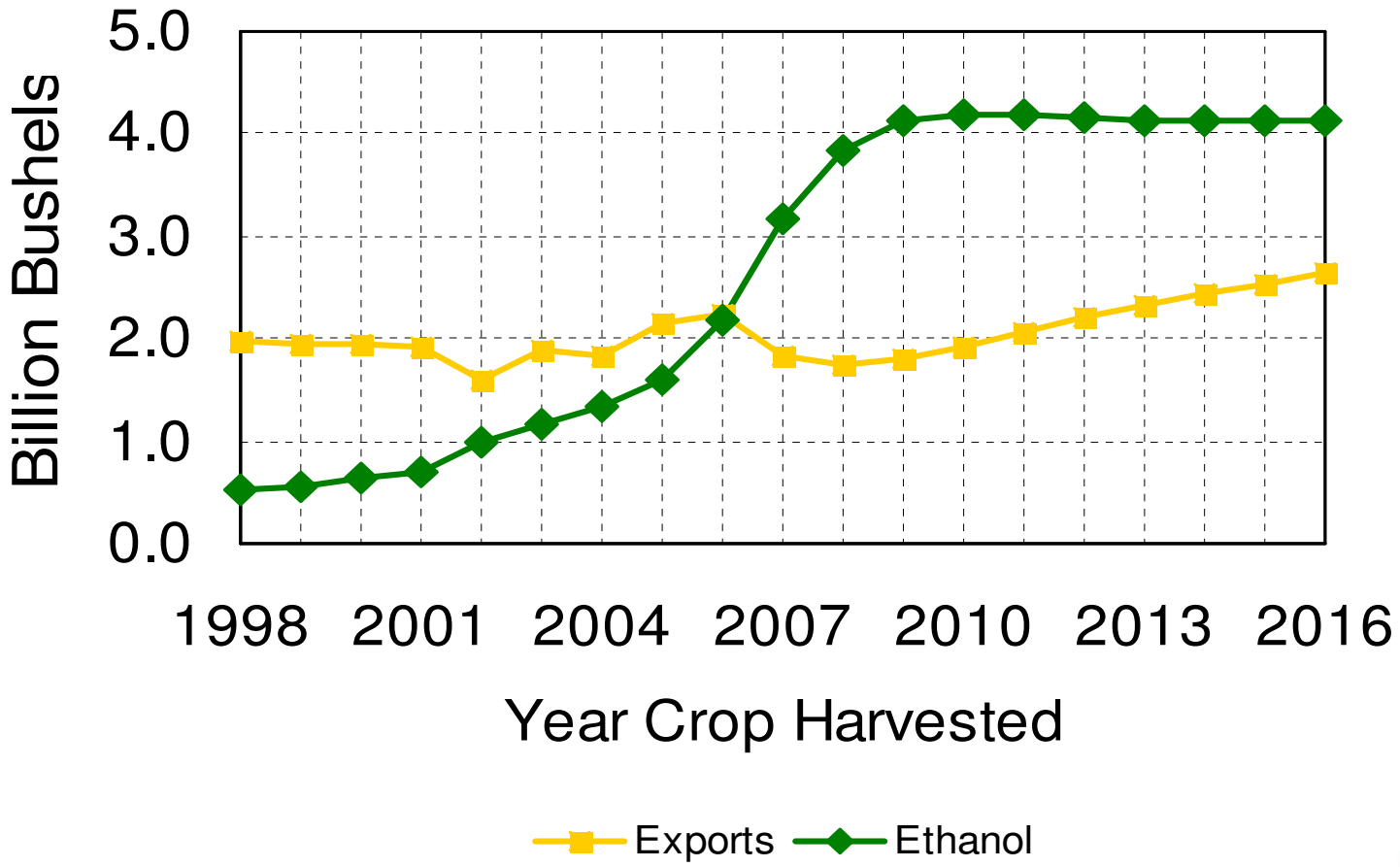
Ethanol Production



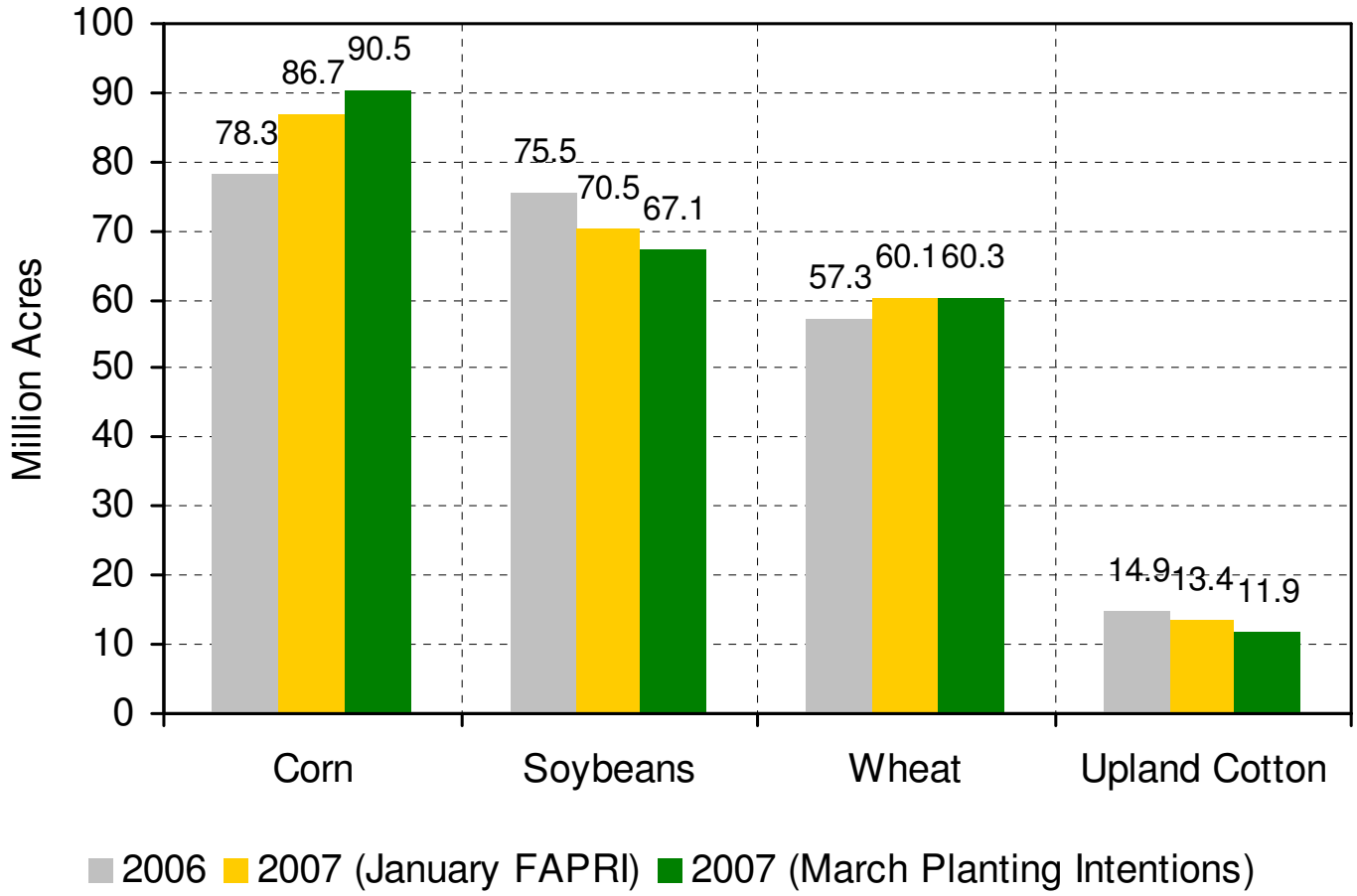
Ethanol Dry Mill Capacity and Utilization



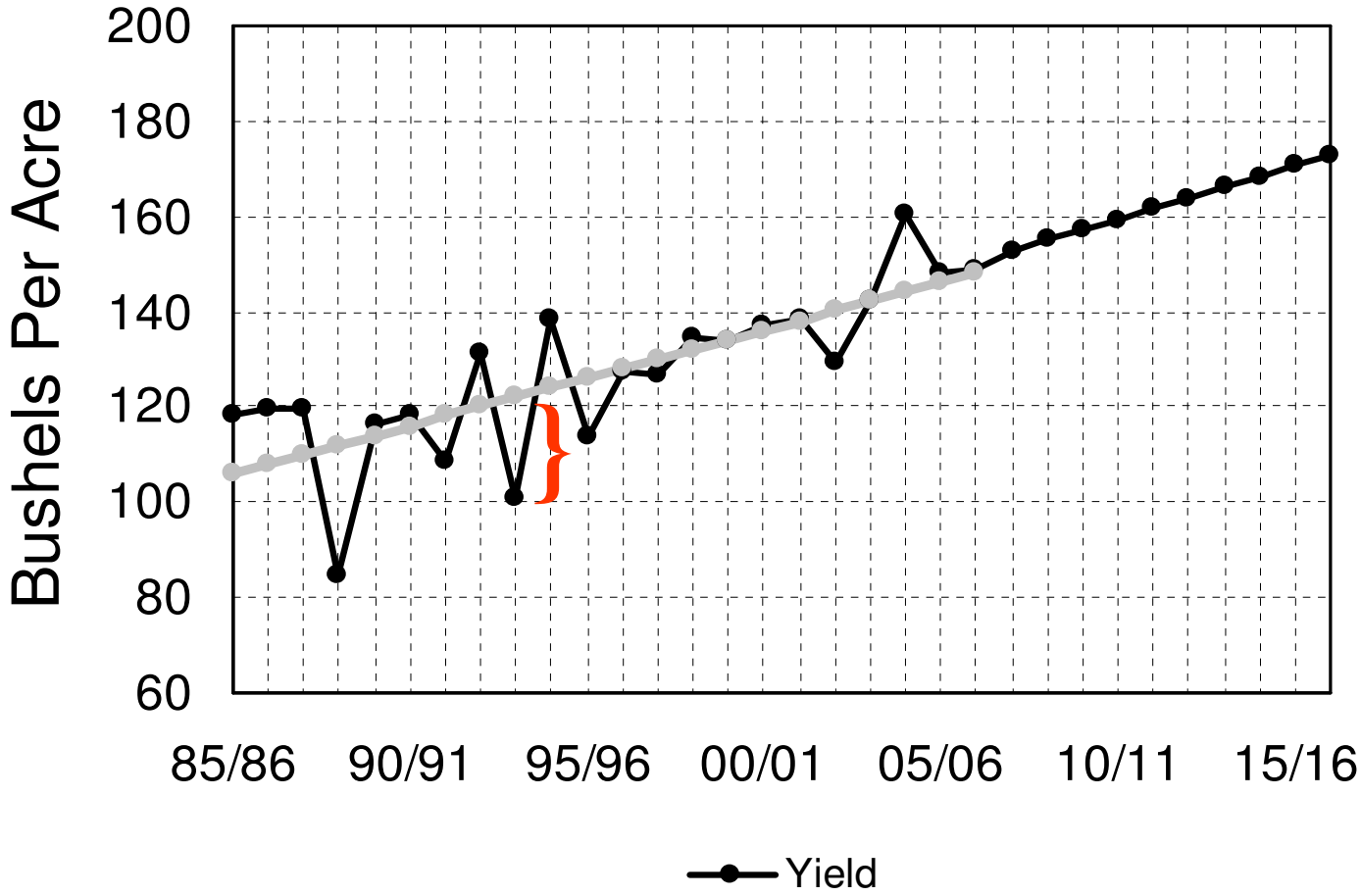
Corn Exports and Use for Ethanol



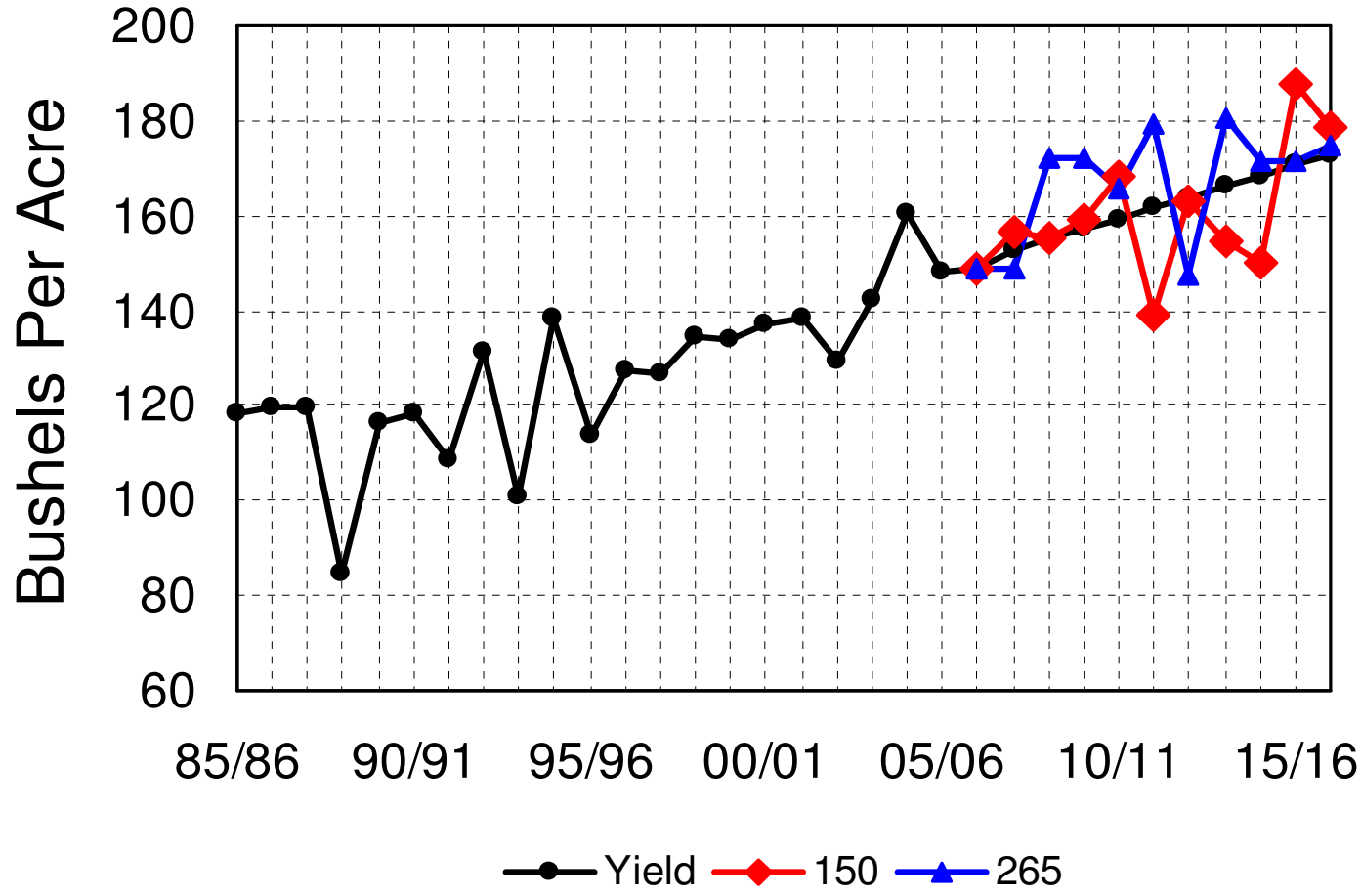
Area Planted: 2006 and 2007*



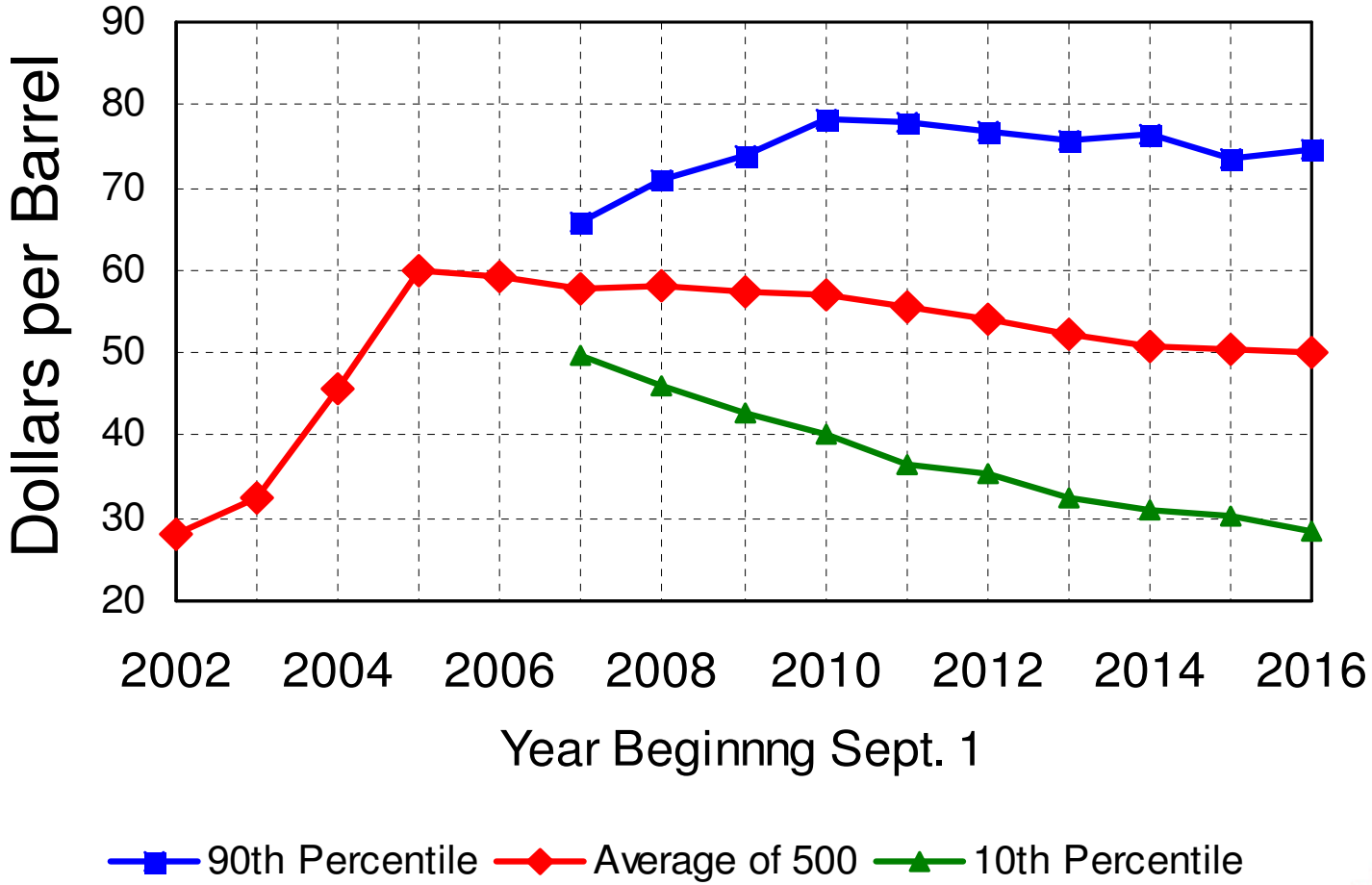
Corn Yields: Adding Uncertainty



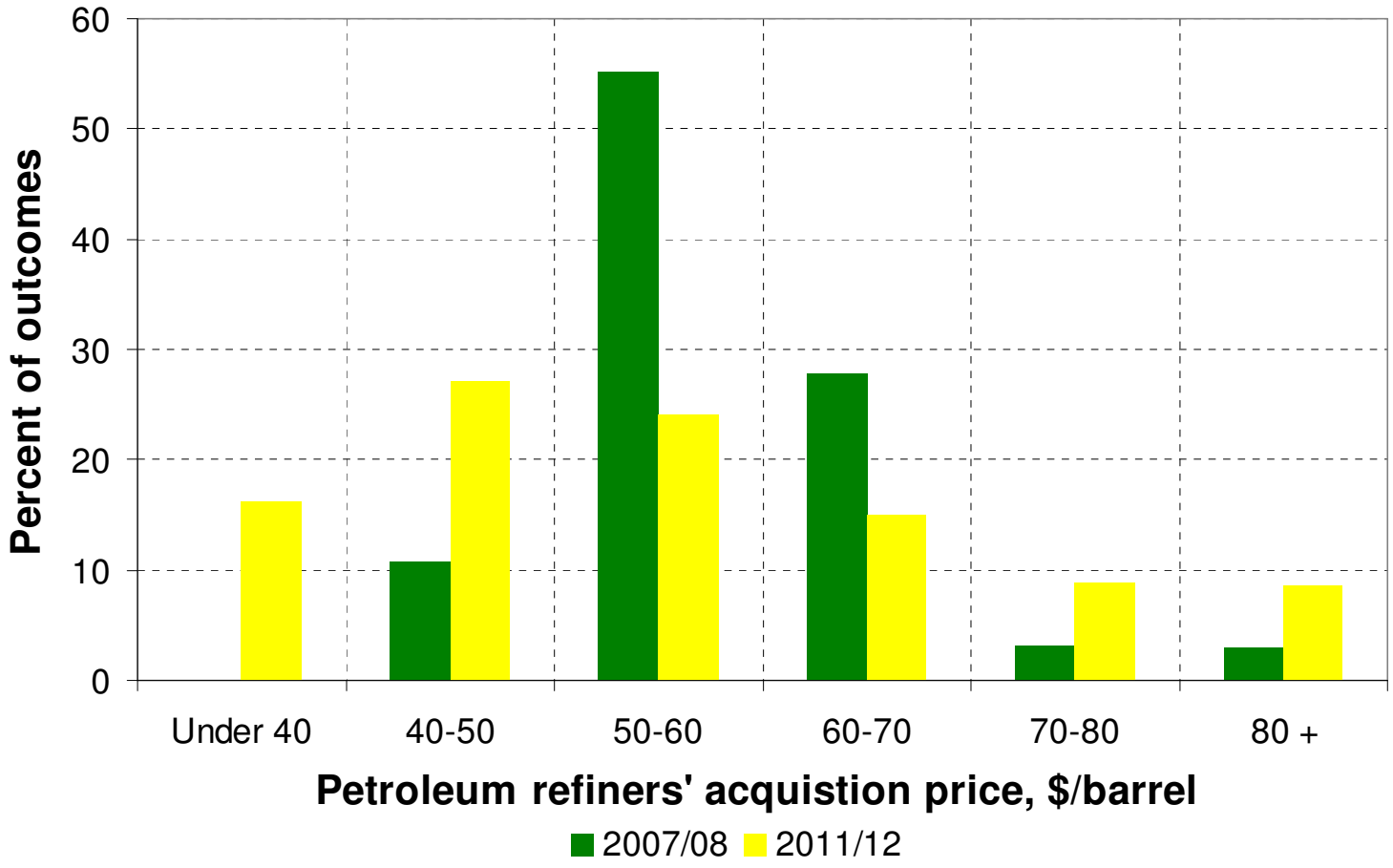
Corn Yields: Adding Uncertainty



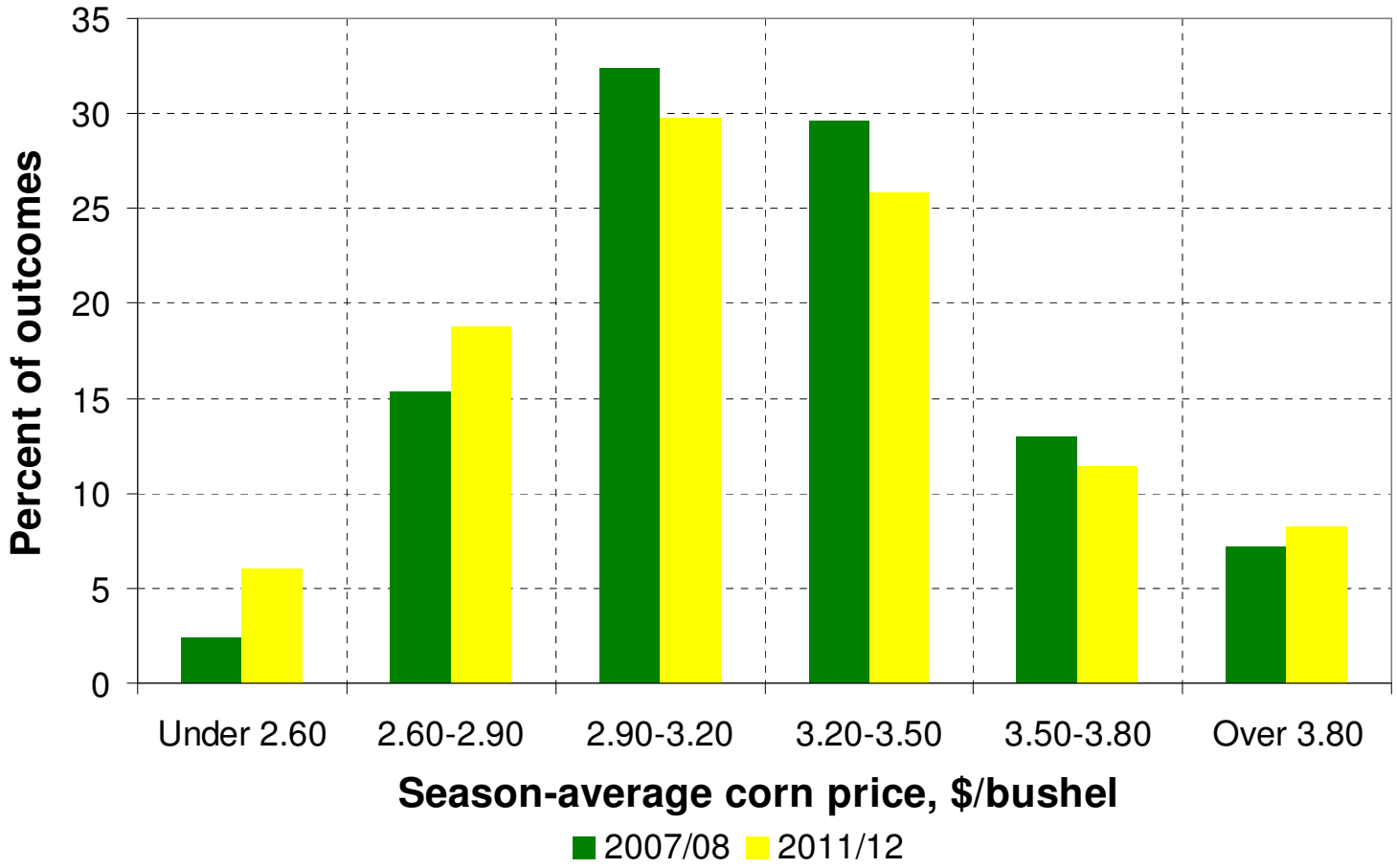
Petroleum Refiners' Acquisition Price



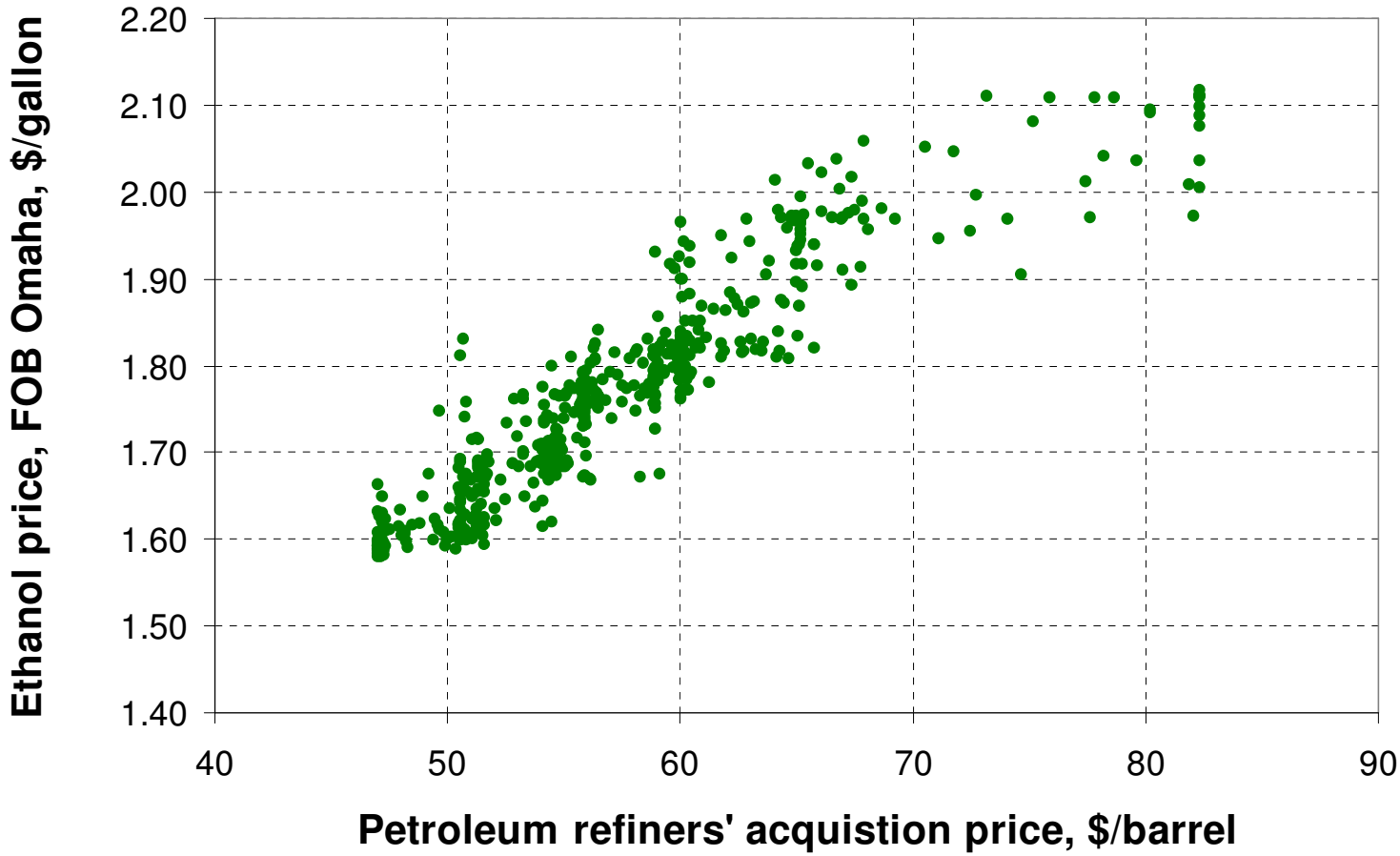
Distribution of petroleum prices, 2007/08 and 2011/12



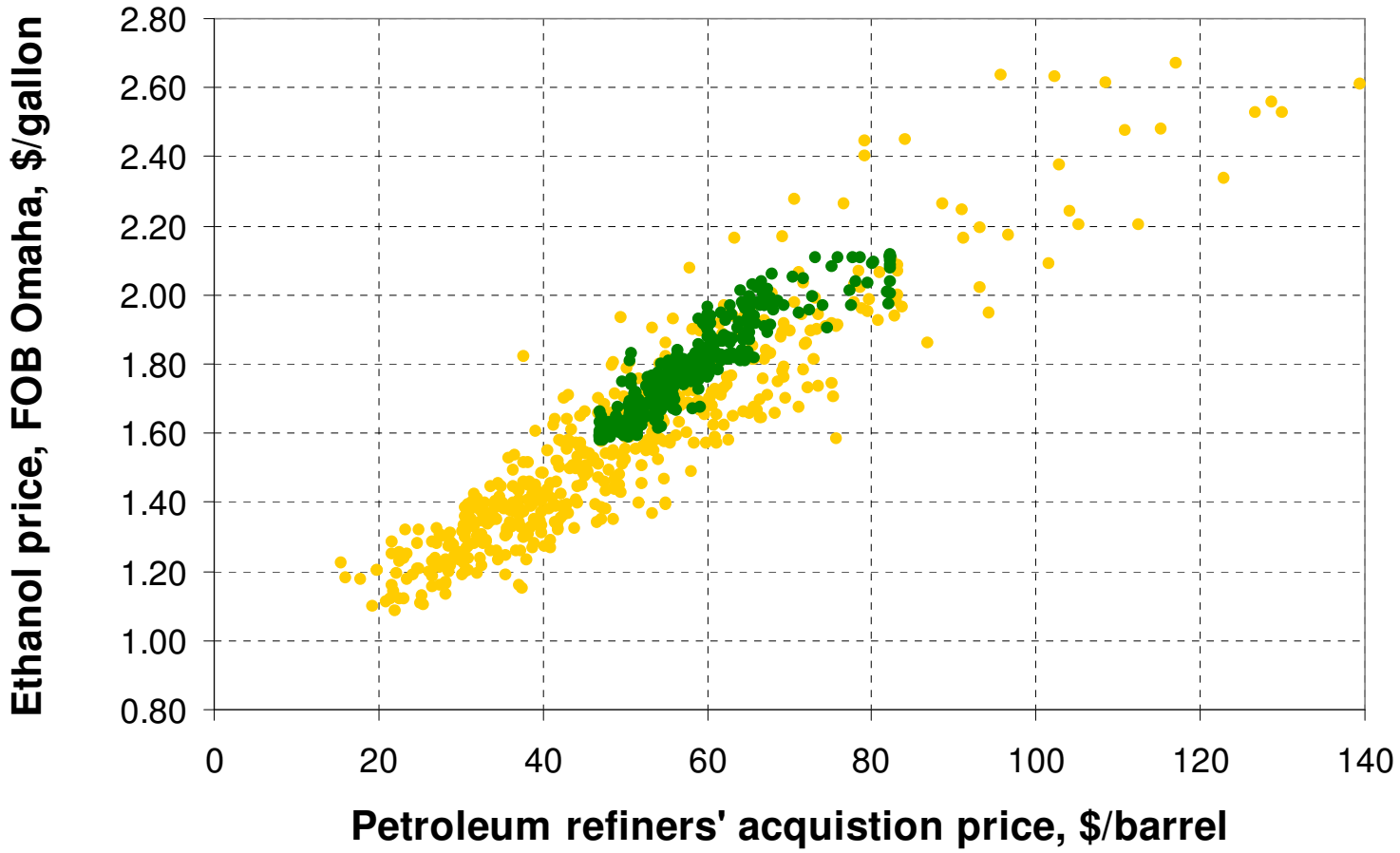
Distribution of corn prices, 2007/08 and 2011/12



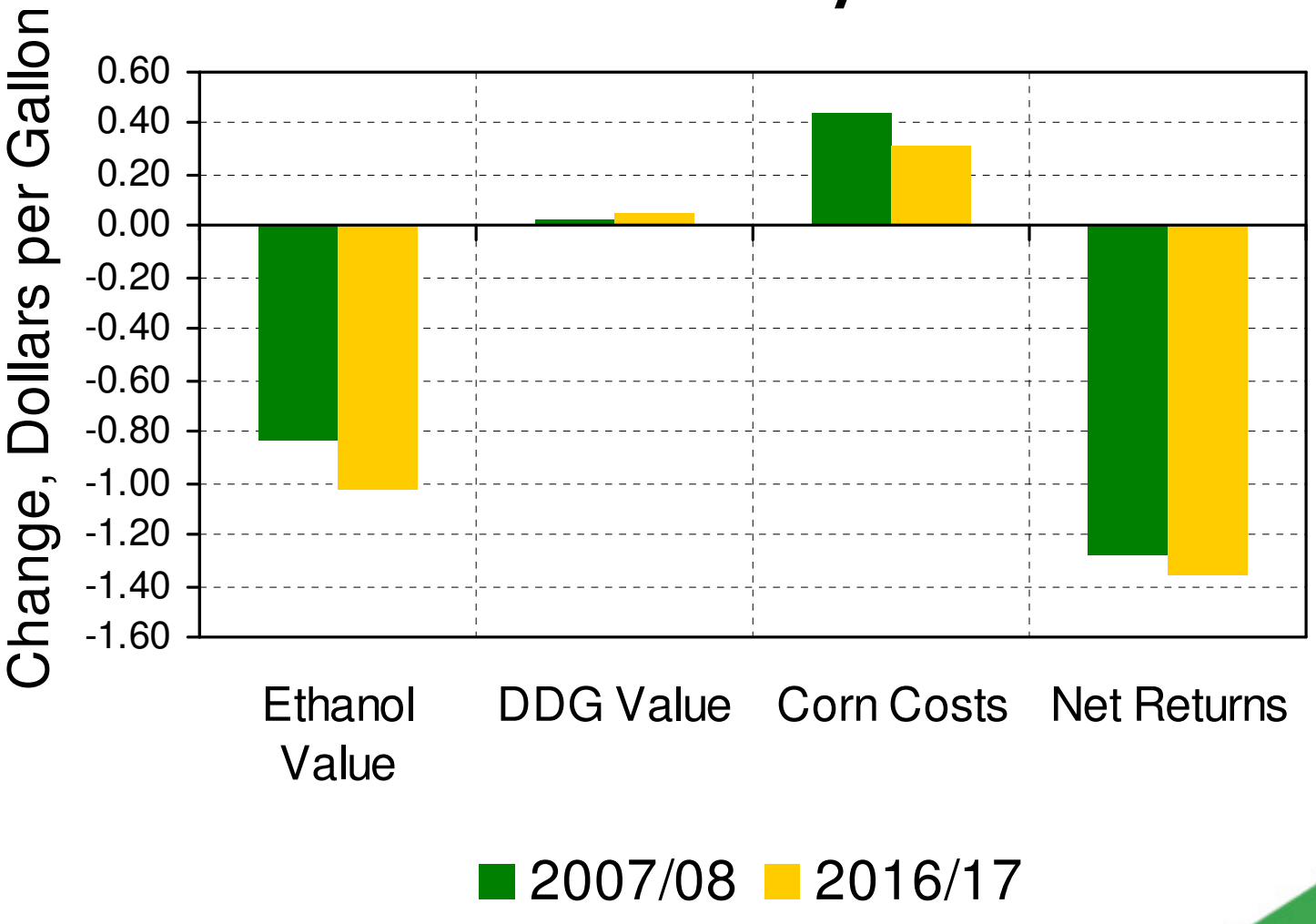
Ethanol and Petroleum Prices 2007/08



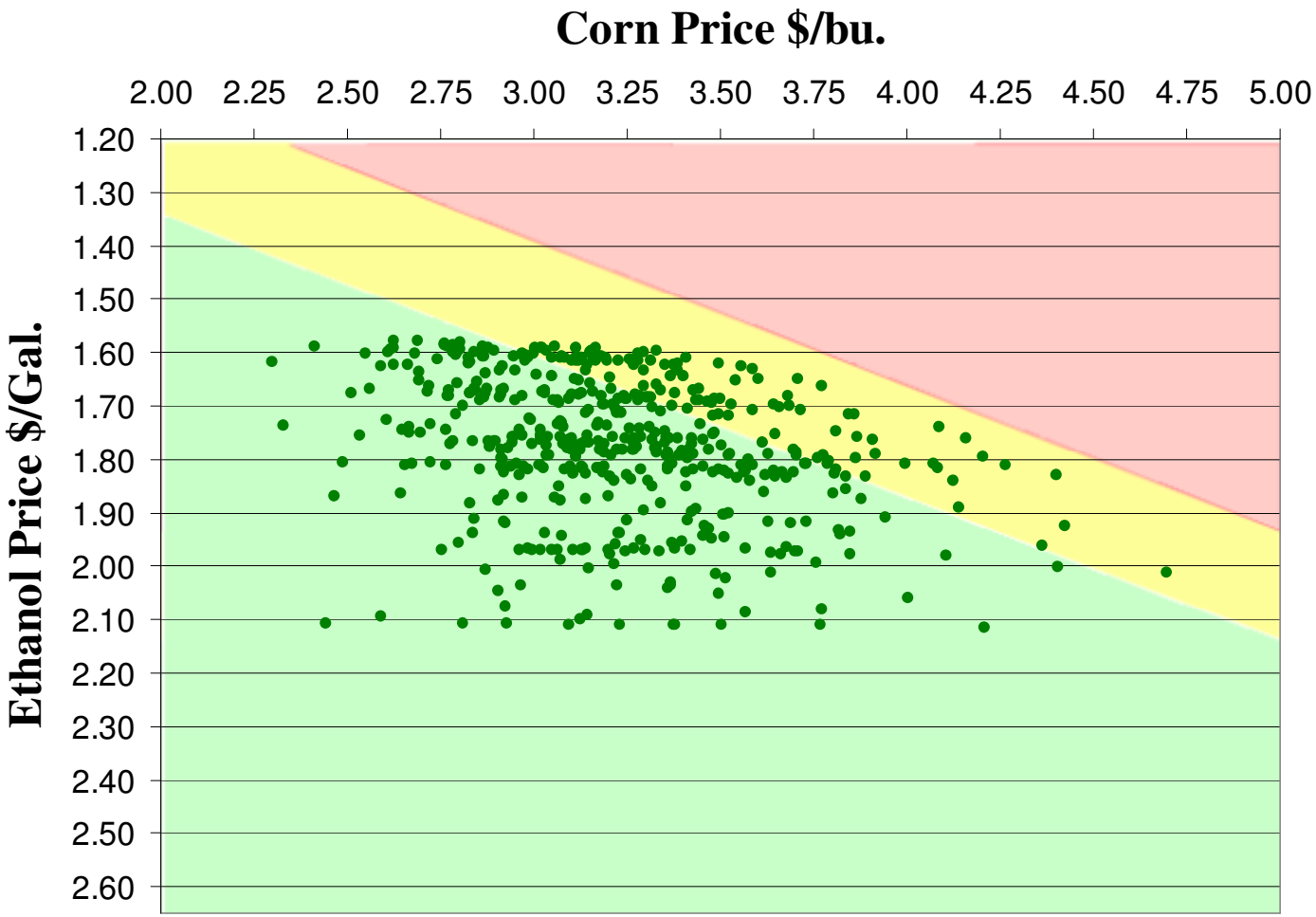
Ethanol and Petroleum Prices 2016/17



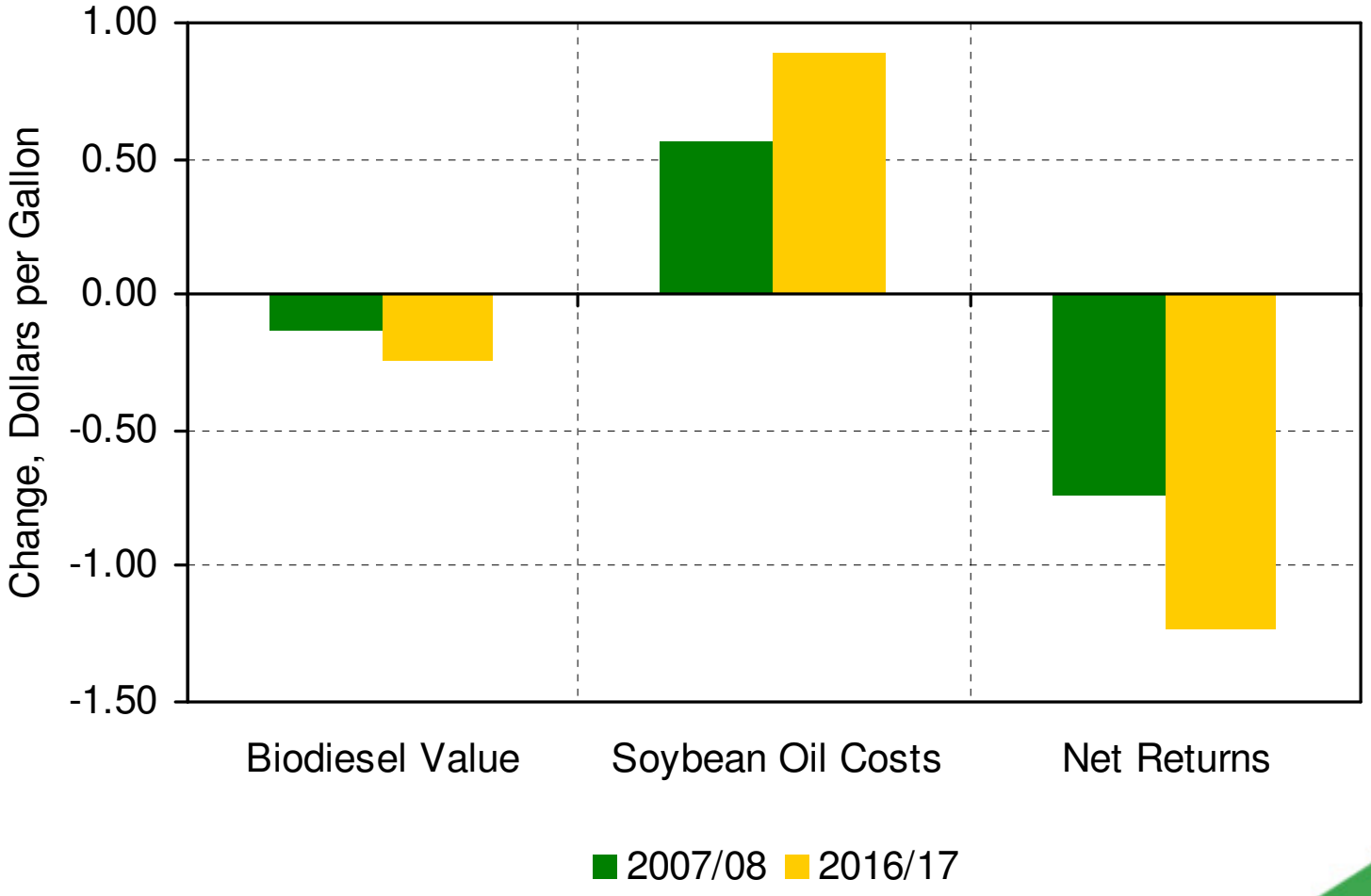
Ethanol Returns and Costs vs. 2005/06



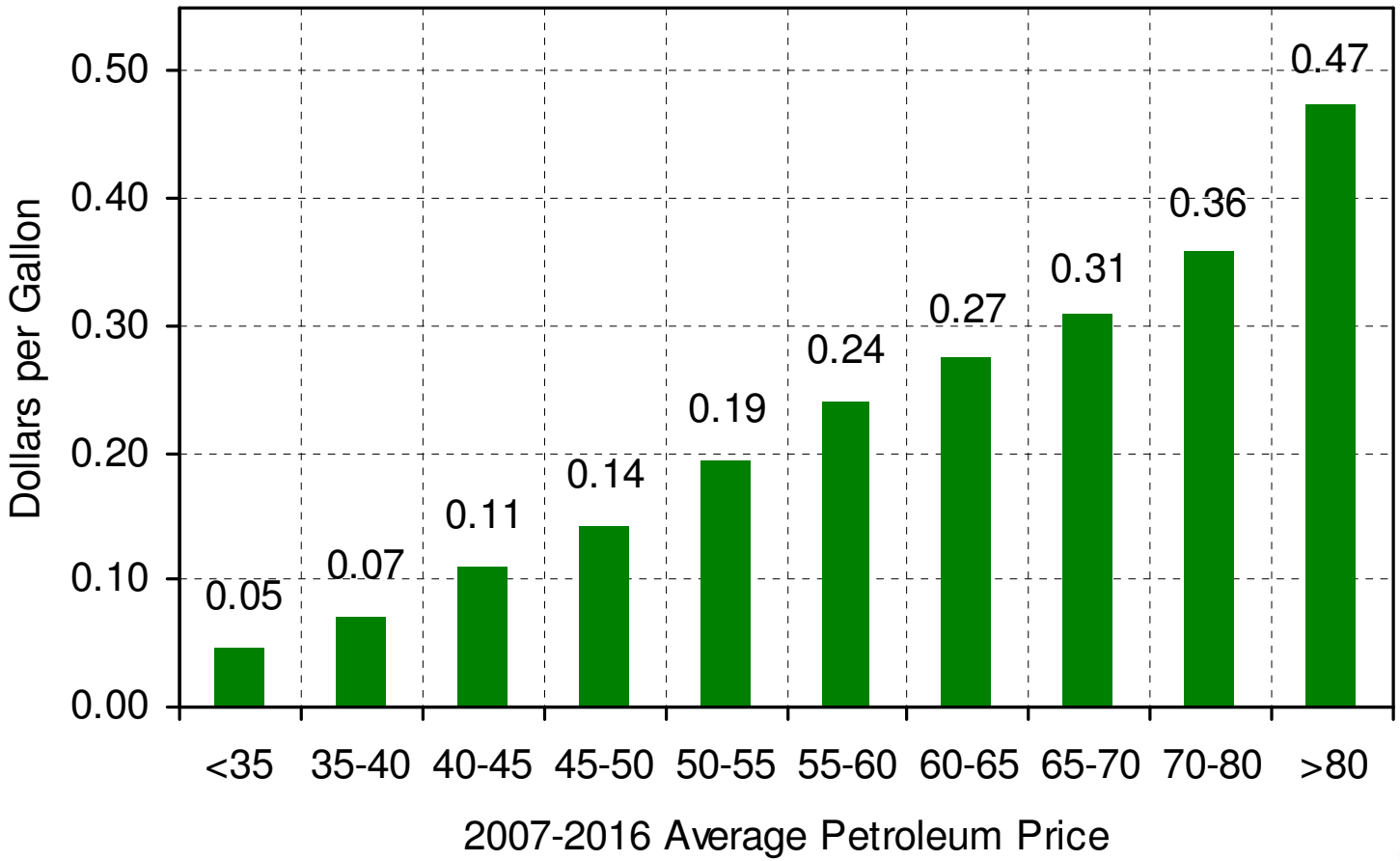
Ethanol and Corn Prices, 2007/08



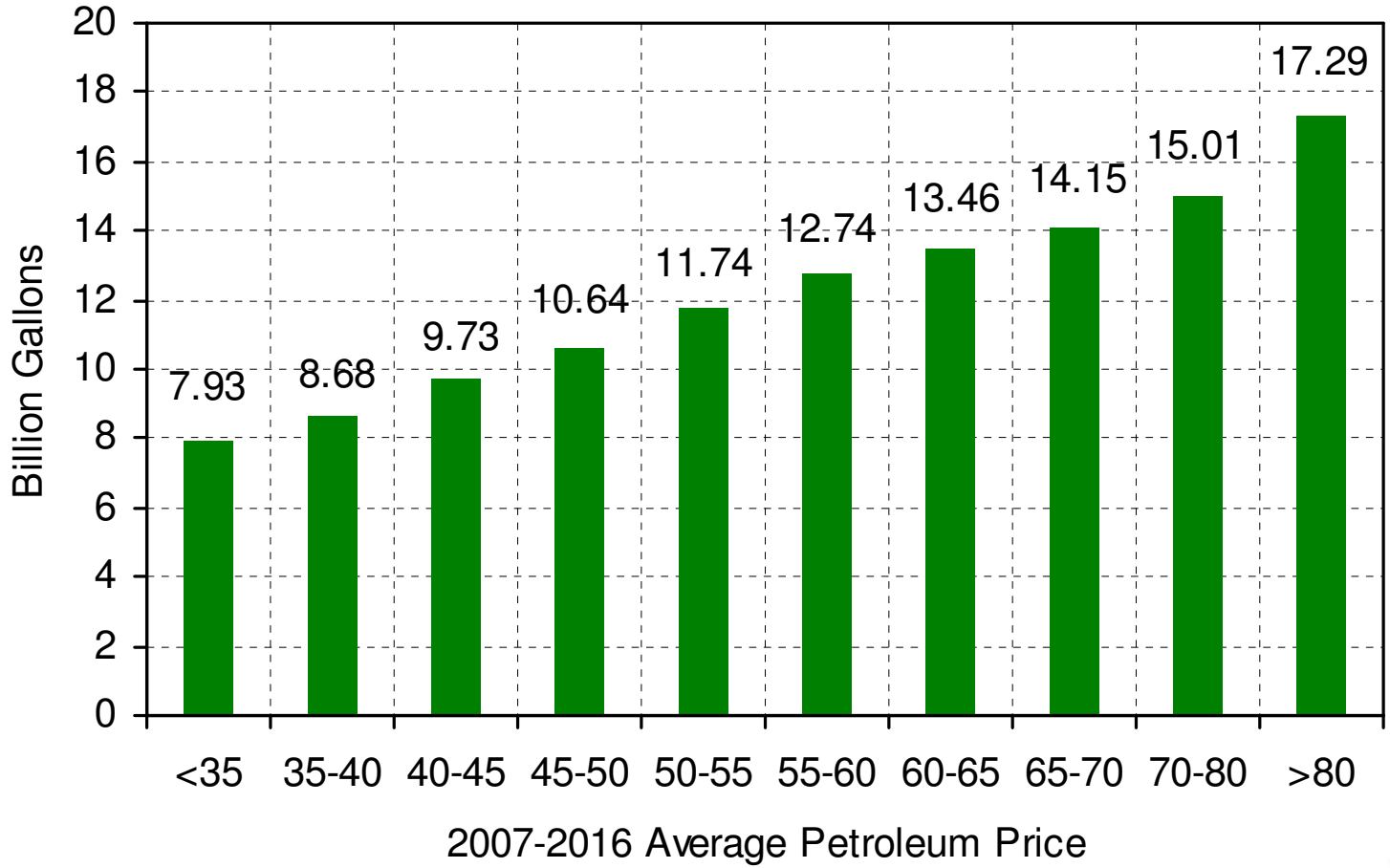
Biodiesel Returns and Costs vs. 2005/06



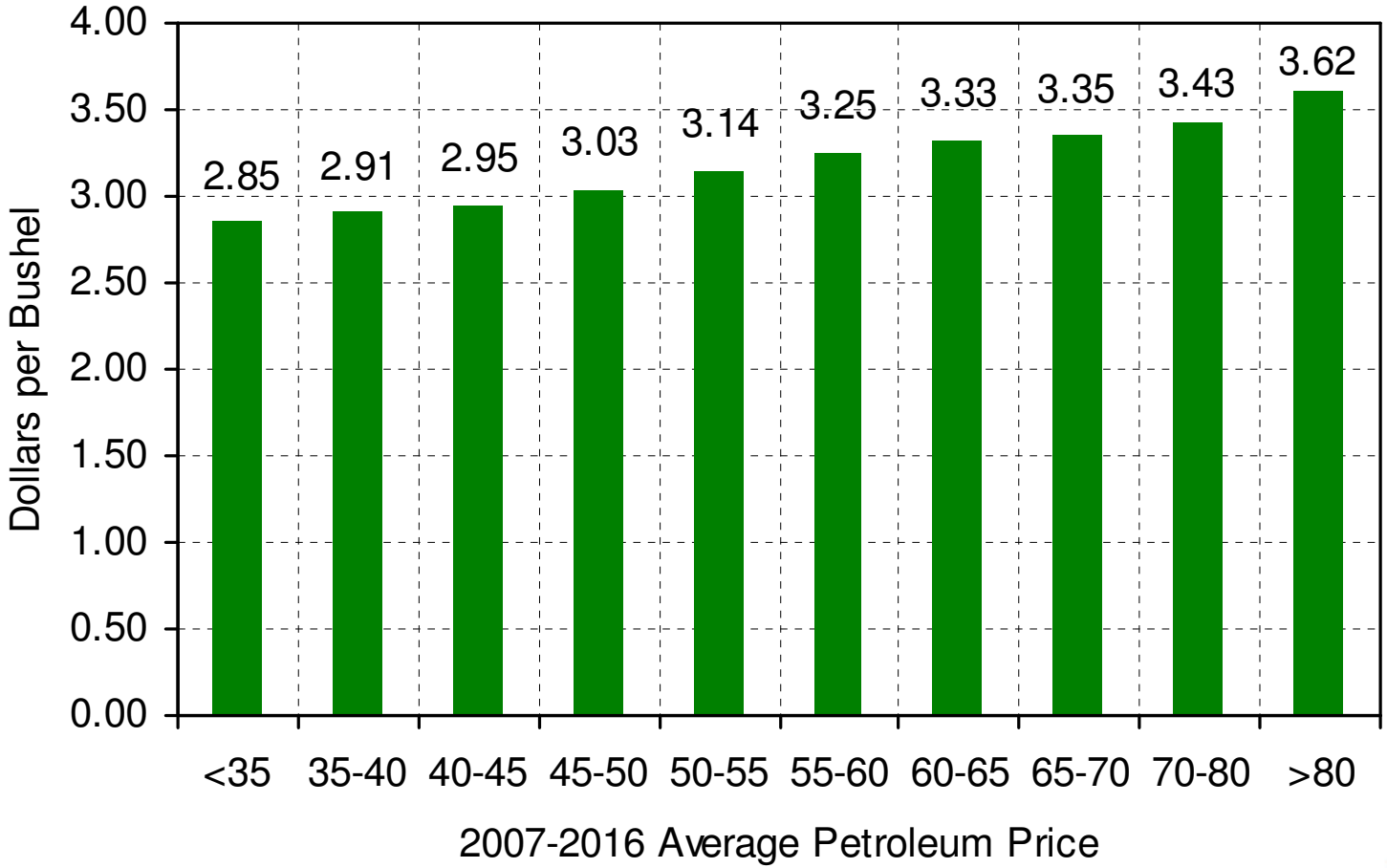
Ethanol Net Operating Returns, 2007-2016 Avg.



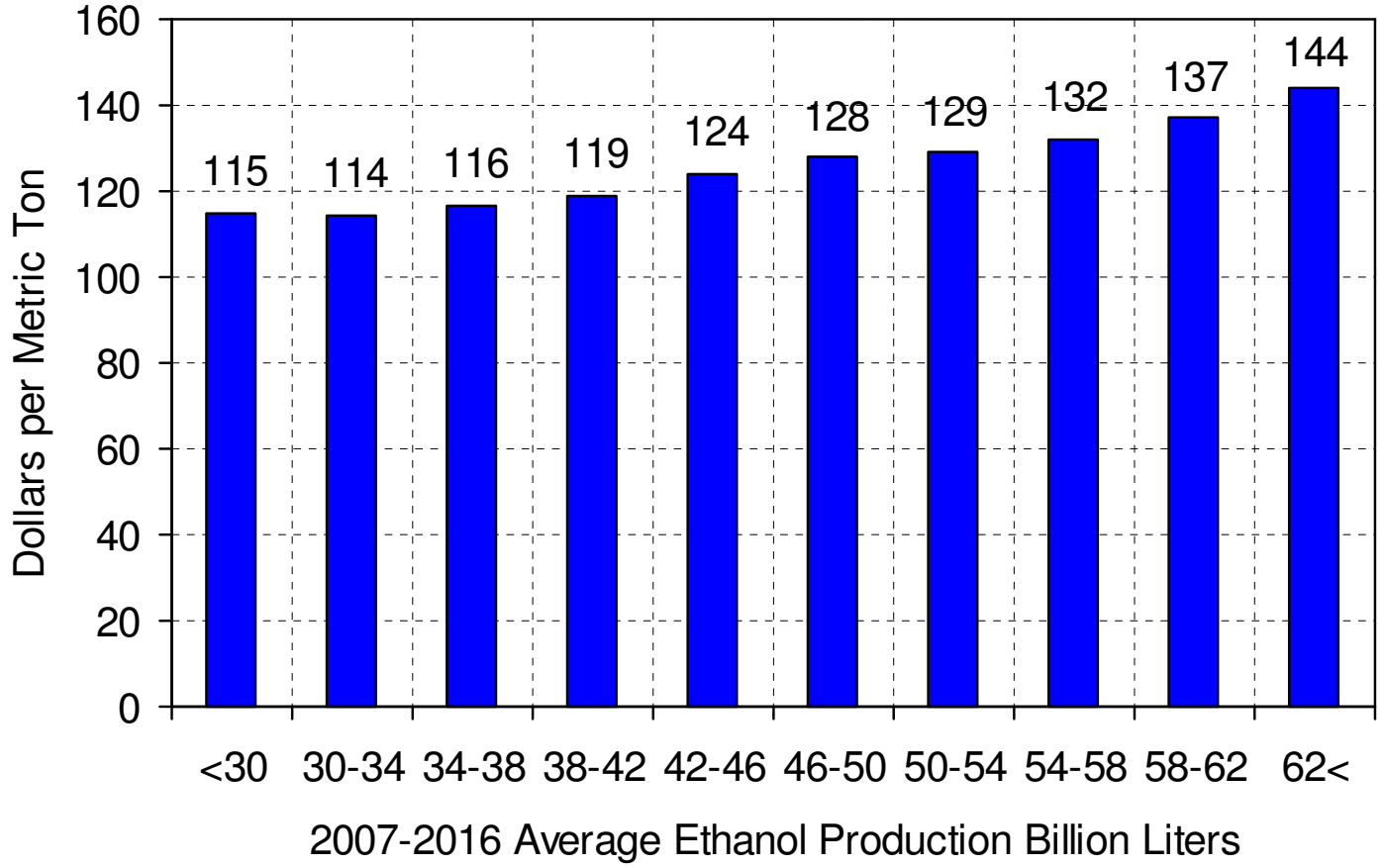
Ethanol Production, 2007-2016 Avg.



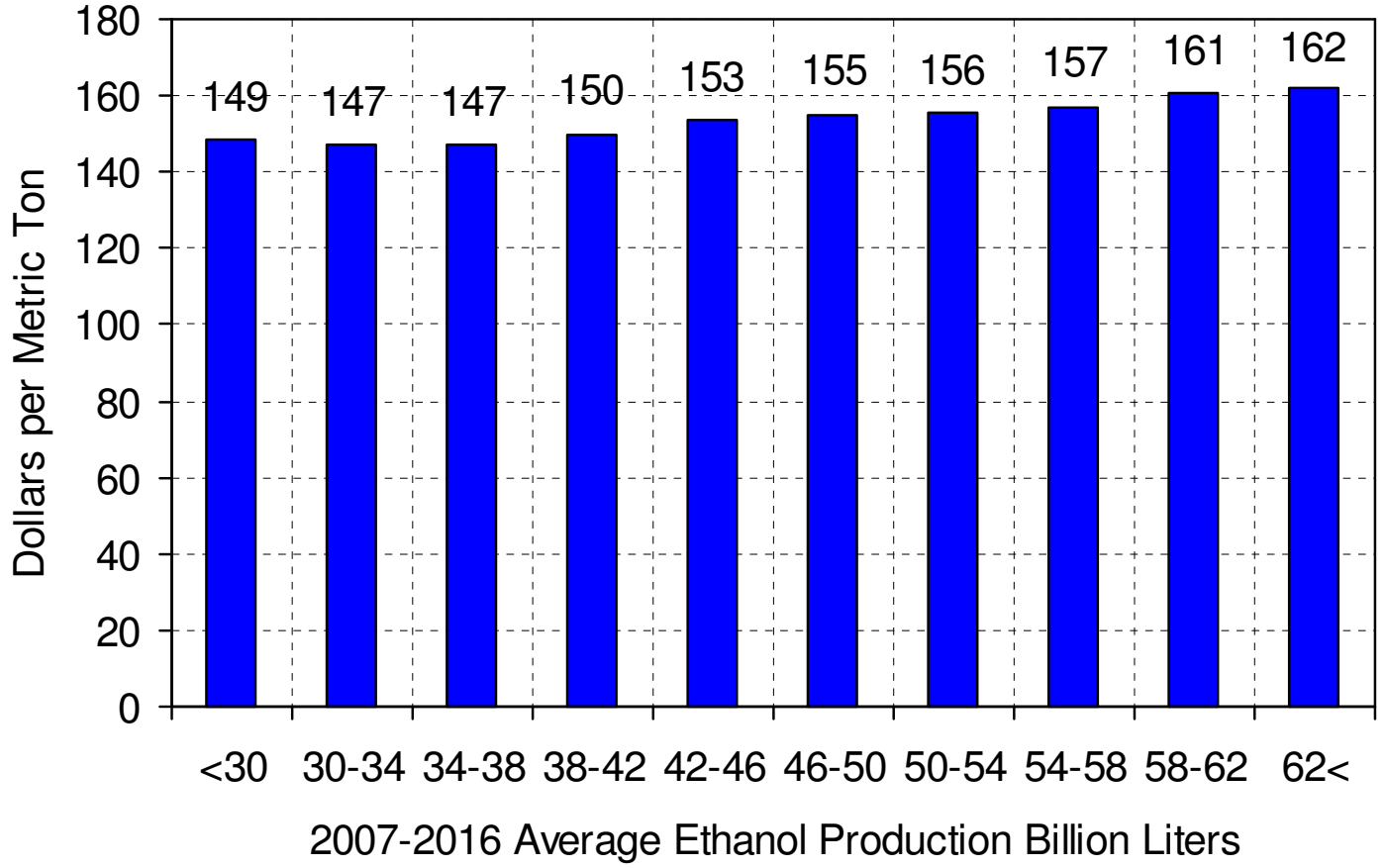
Corn Prices, 2007-2016 Avg.



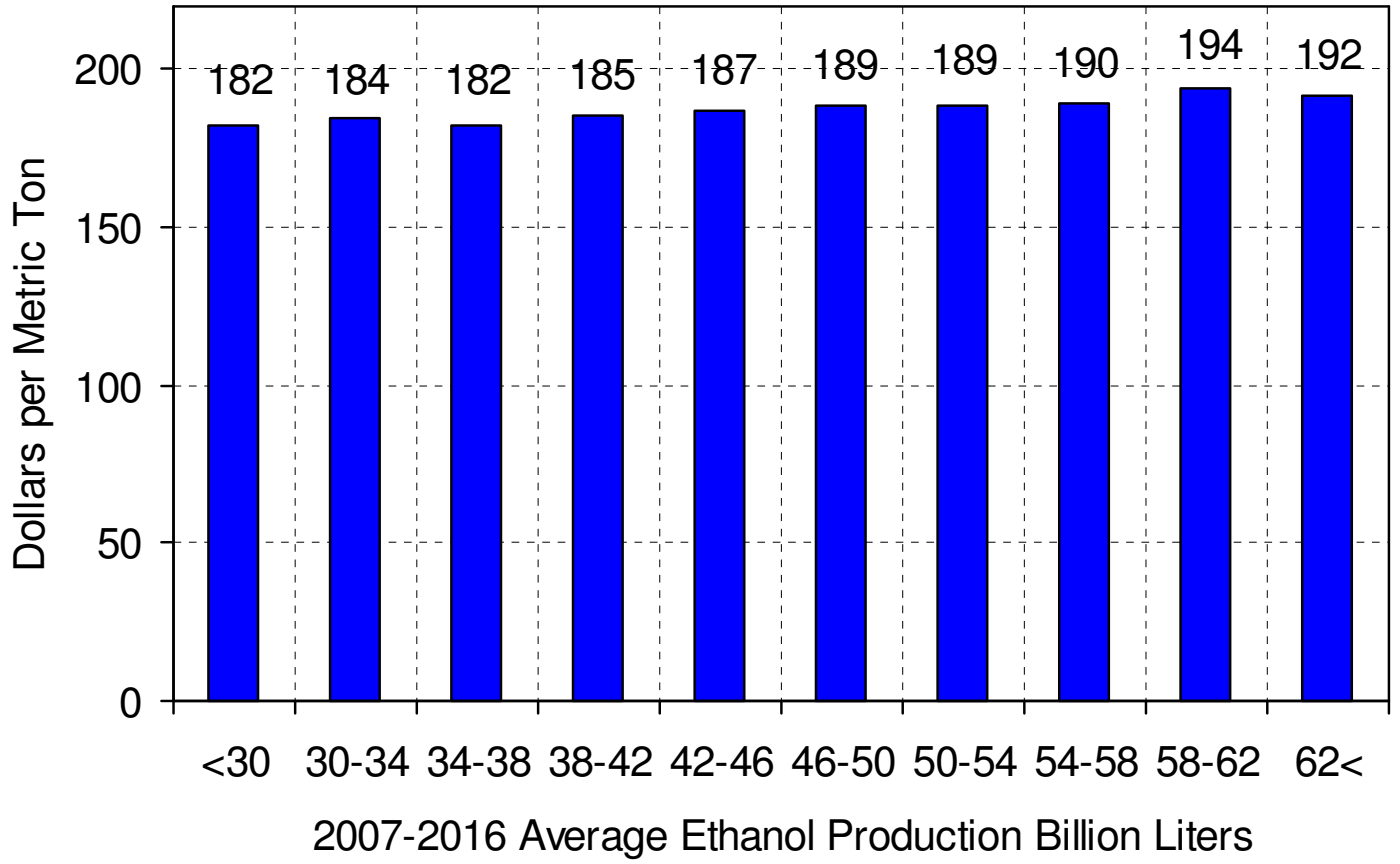
Distribution of 2007-2016 Avg. Corn Farm Prices



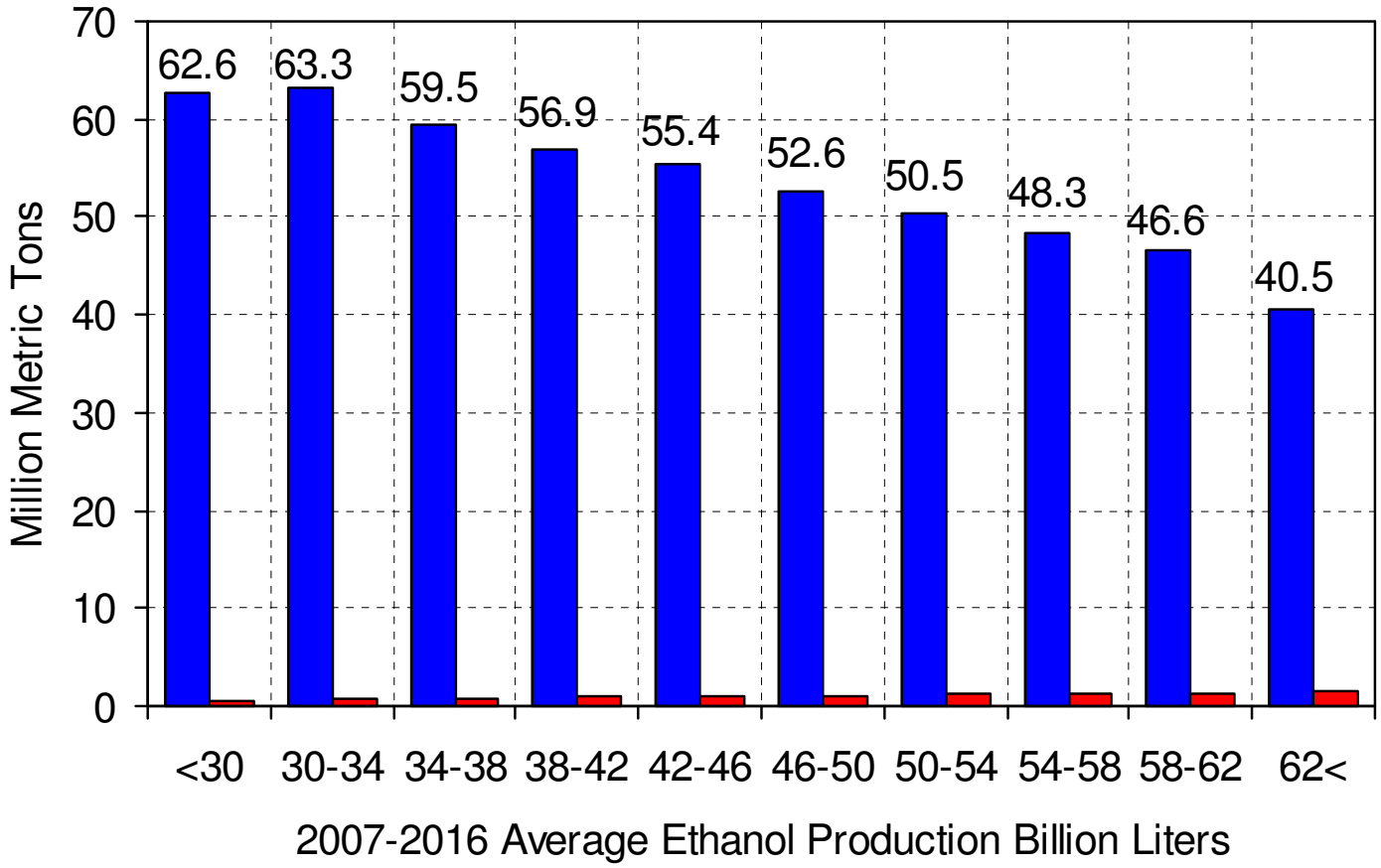
Distribution of 2007-2016 Avg. Wheat Farm Prices



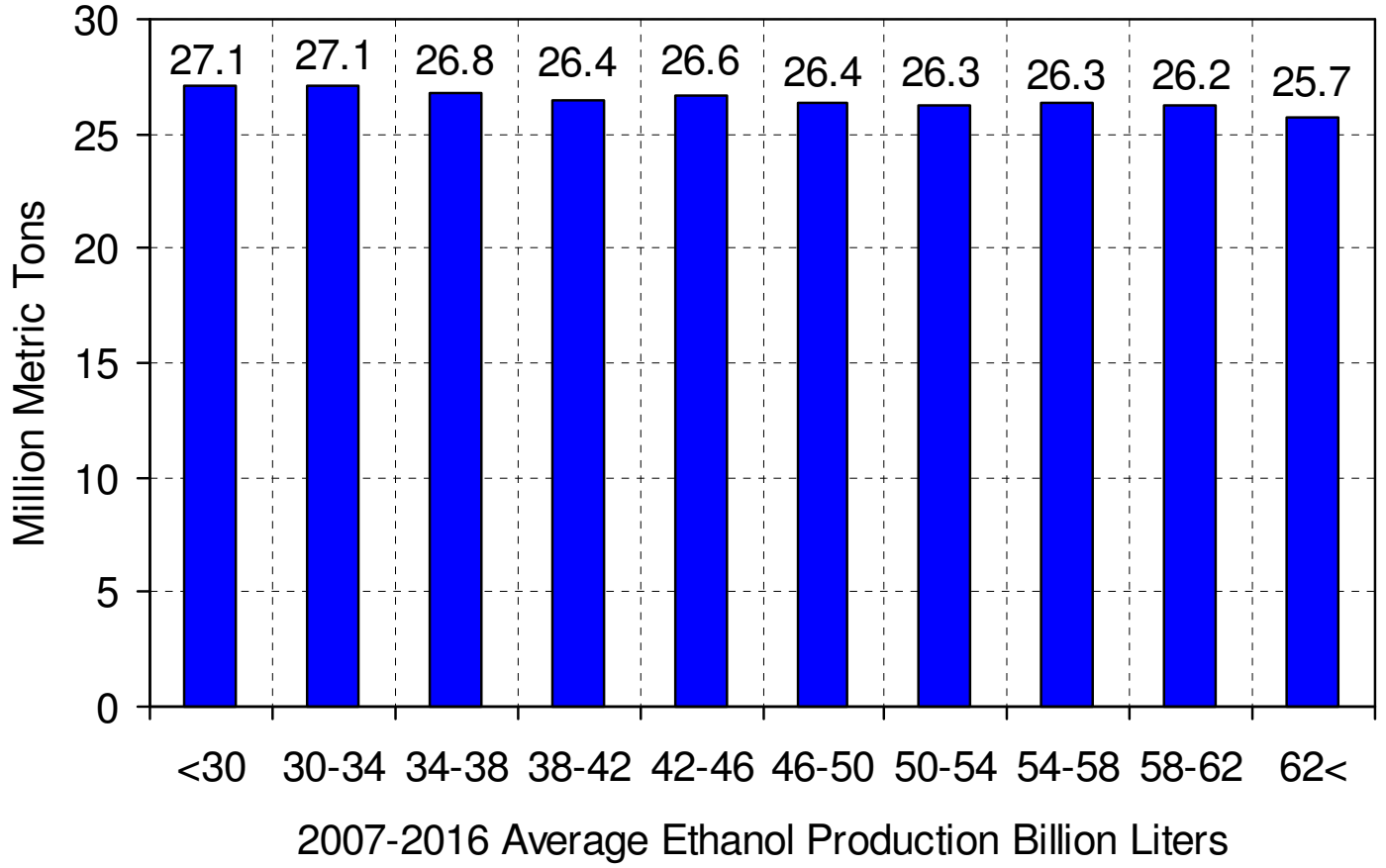
Distribution of 2007-2016 Avg. Rice Farm Prices



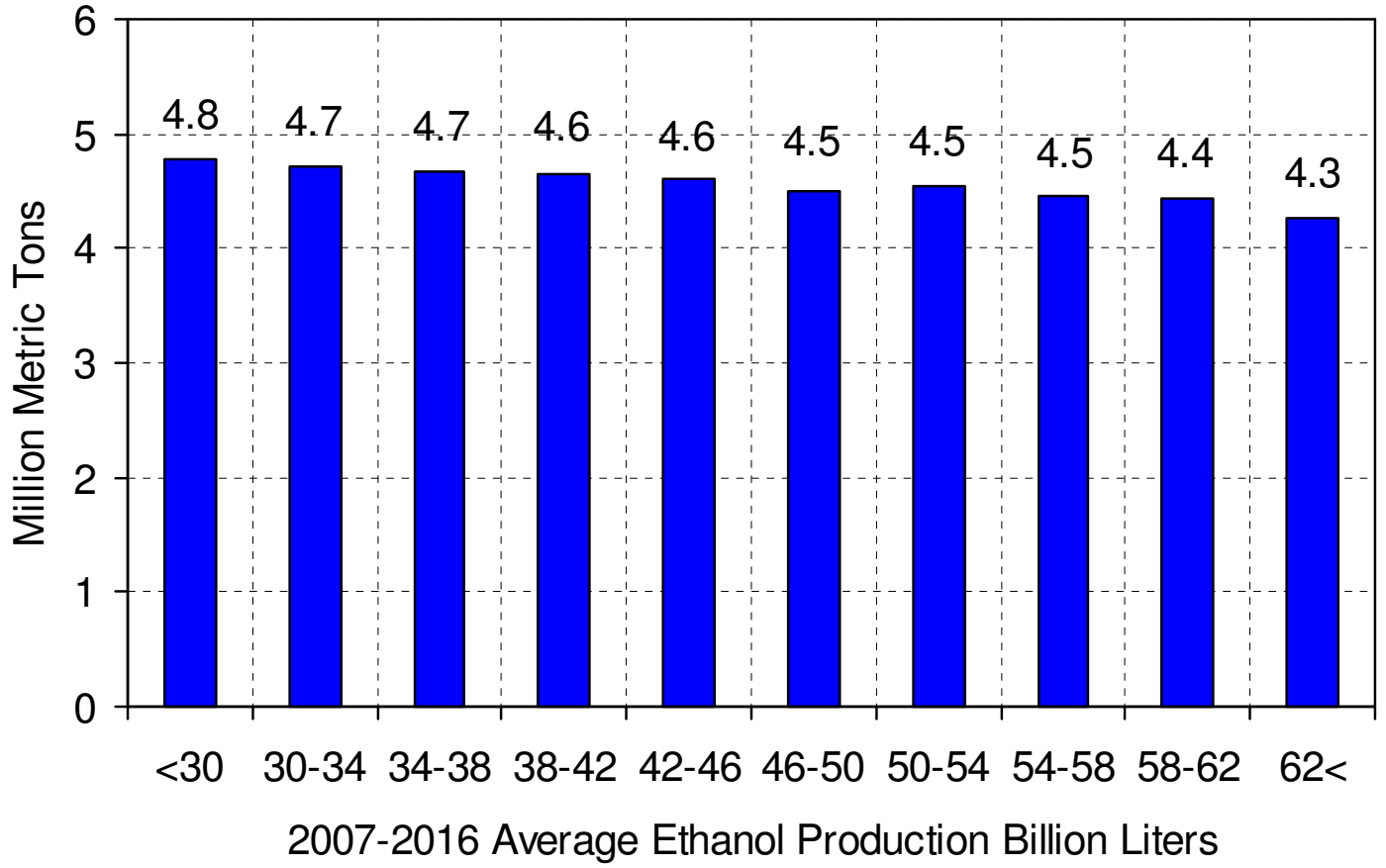
Distribution of 2007-2016 Avg. Corn, DDG Exports



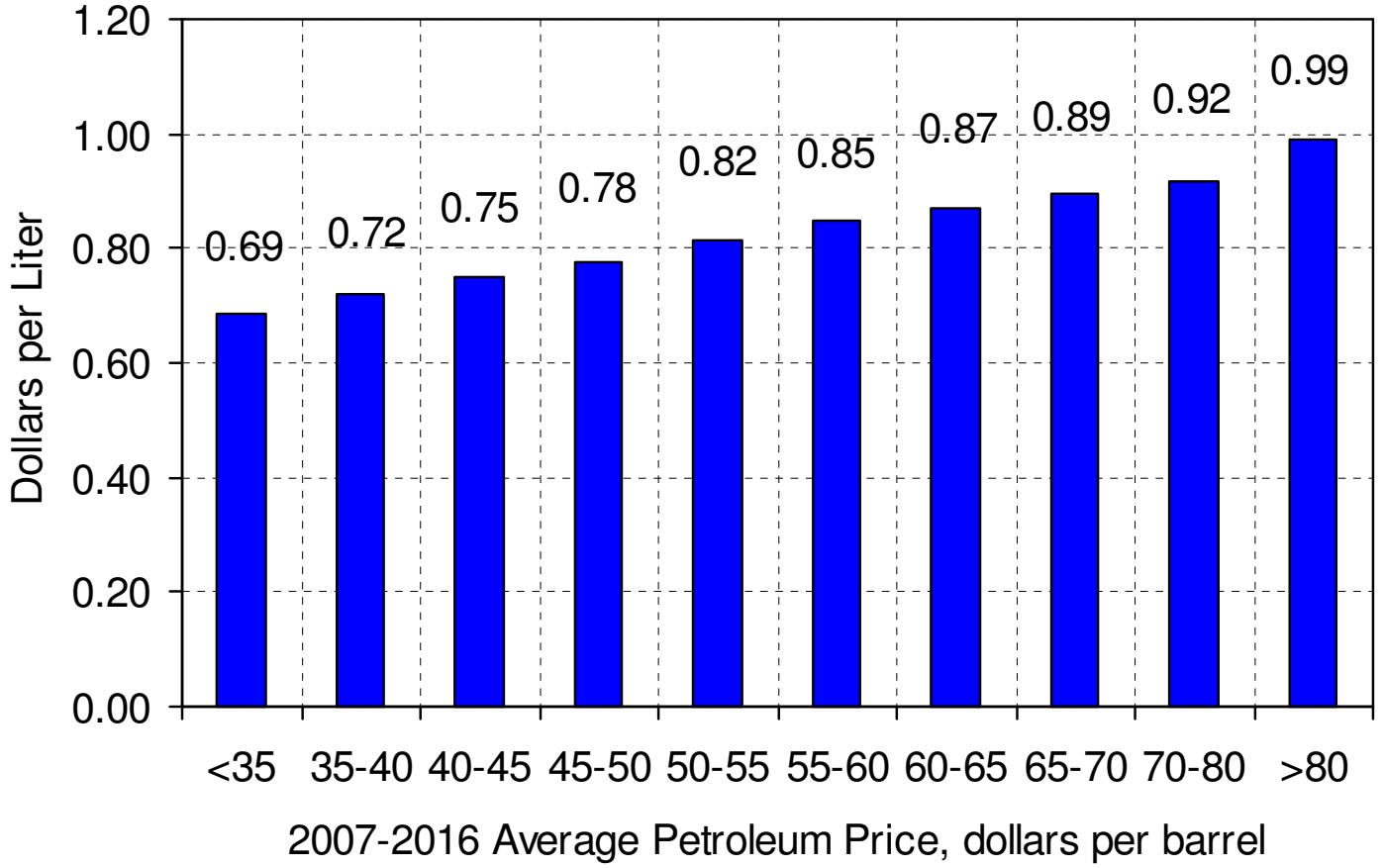
Distribution of 2007-2016 Avg. Wheat Exports



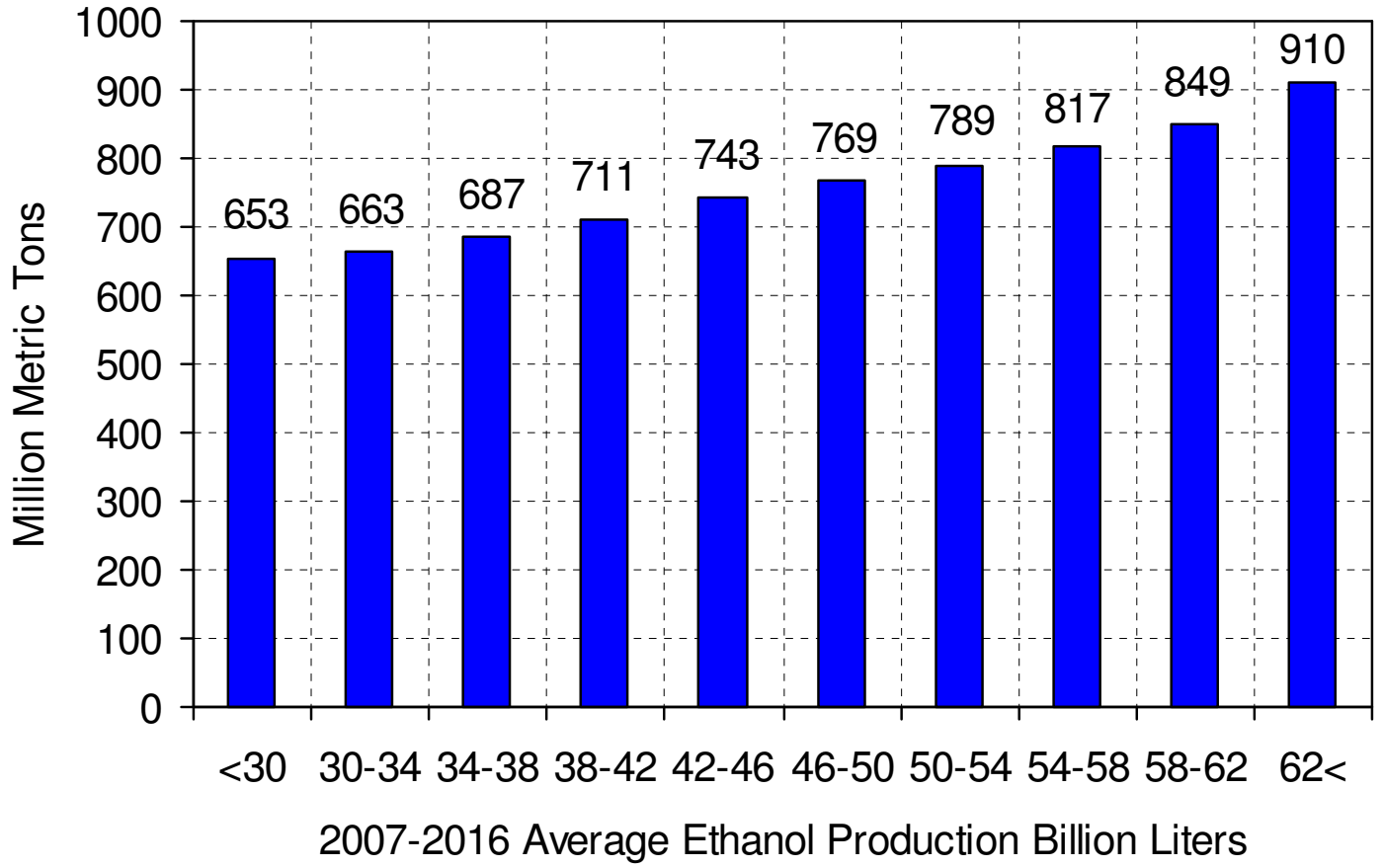
Distribution of 2007-2016 Avg. Rice Exports



Biodiesel Price, Plant, 2007-2016 Avg.



Distribution of 2007-2016 Avg. Soyoil Price



Distribution of 2007-2016 Avg. Soybean Exports