



How Much and How Quick?
Pass-through of Commodity and Input
Cost Changes to U.S. Retail Food Prices
by
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Power Point Presentation for the
International Agricultural Trade Research Consortium
Analytic Symposium
*“Confronting Food Price Inflation:
Implications for Agricultural Trade and Policies”*

June 22-23, 2009
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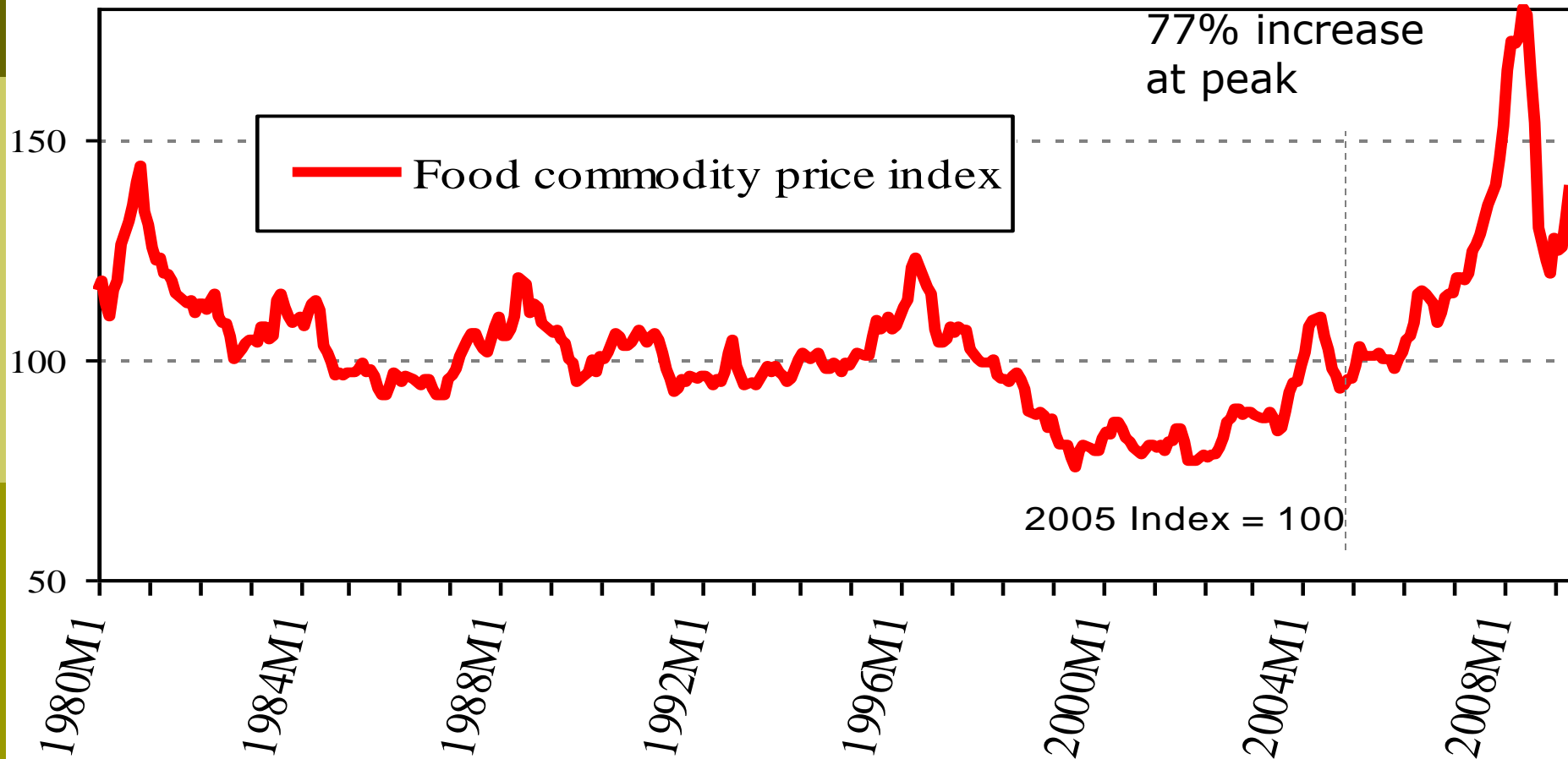
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**Presented at the *Confronting Food Price Inflation:
Implications for Agricultural
Trade and Policies* Symposium**

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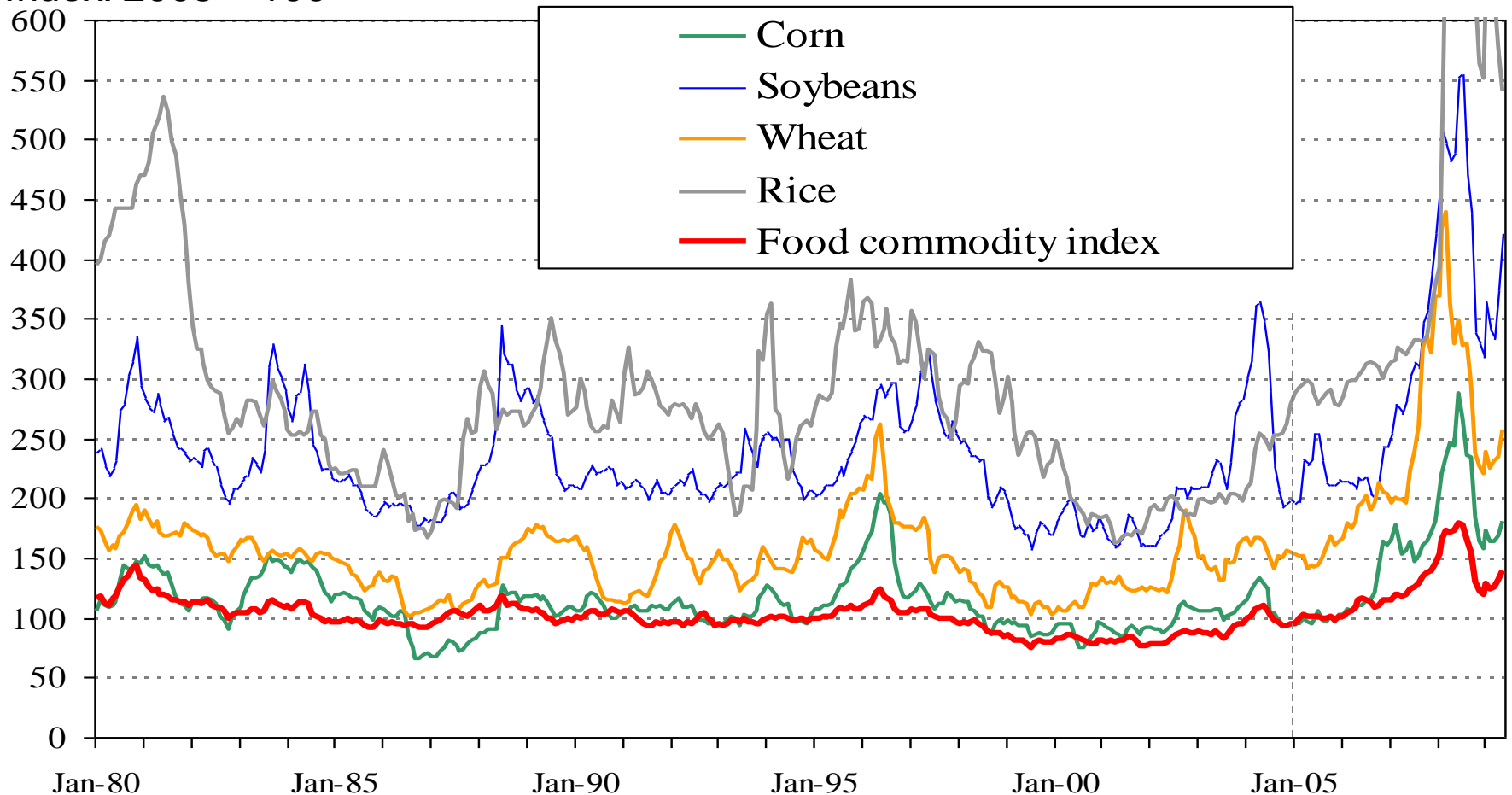
Food commodity prices down 22% from the 2008 peak, but still up 38% since January 2006

Source: International Monetary Fund: International Financial Statistics



Spikes in food commodity prices: Will this time be any different?

Index: 2005 = 100

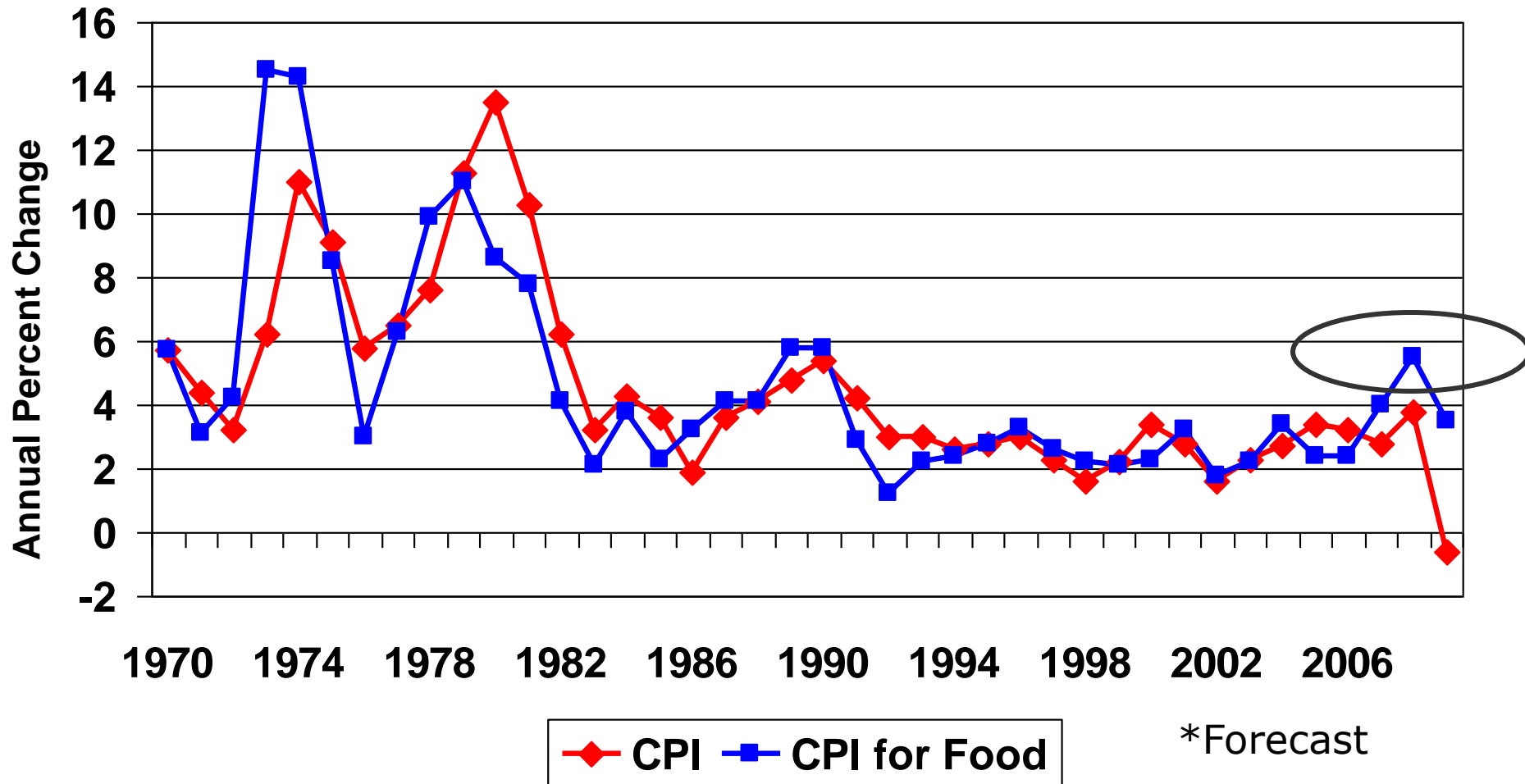


Source: International Monetary Fund: International Financial Statistics

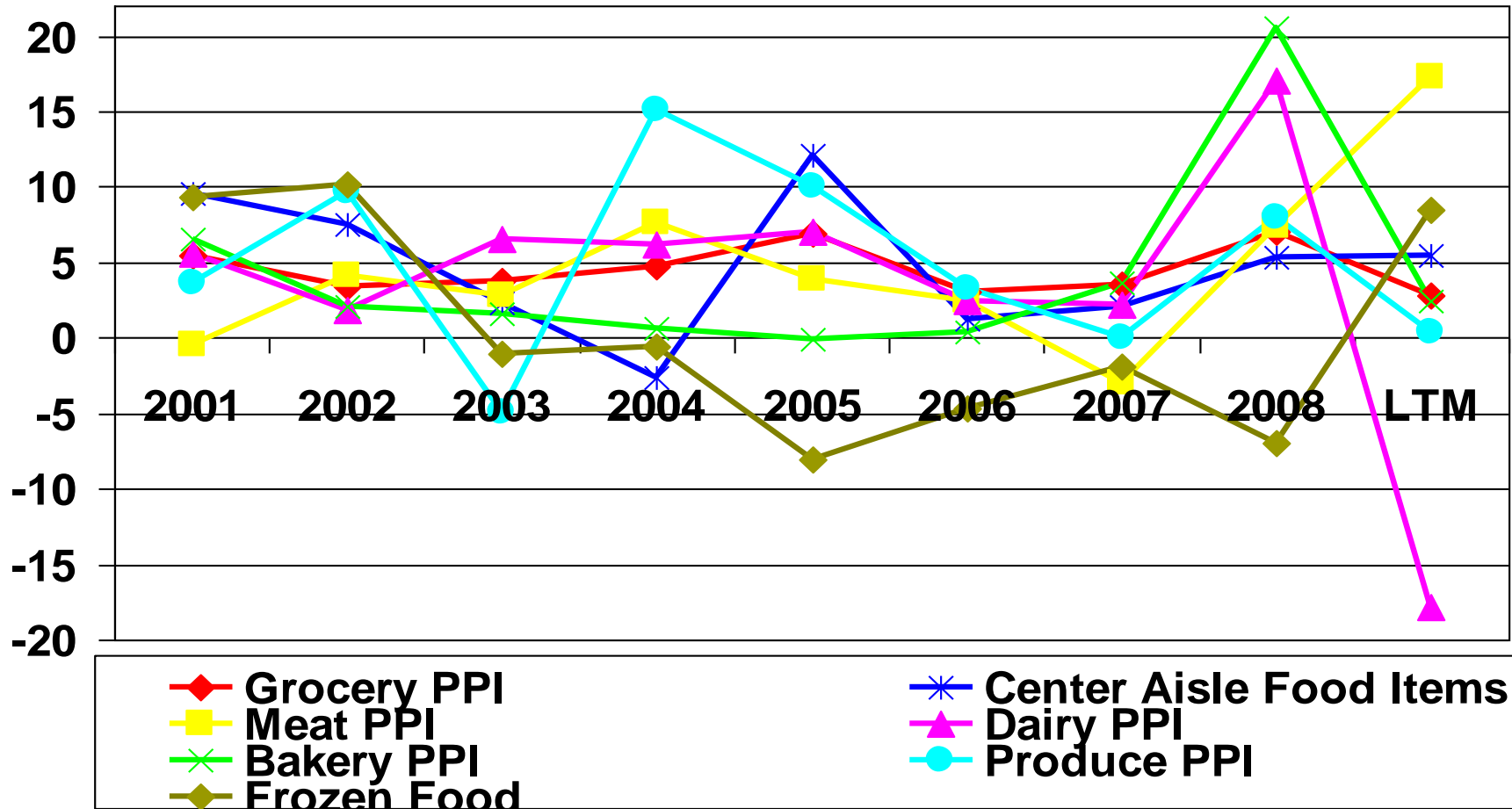
 **ERS** ECONOMIC RESEARCH SERVICE
United States Department of Agriculture

The Economics of Food, Farming, Natural Resources, and Rural America

CPI vs. CPI for Food 1970-2009*



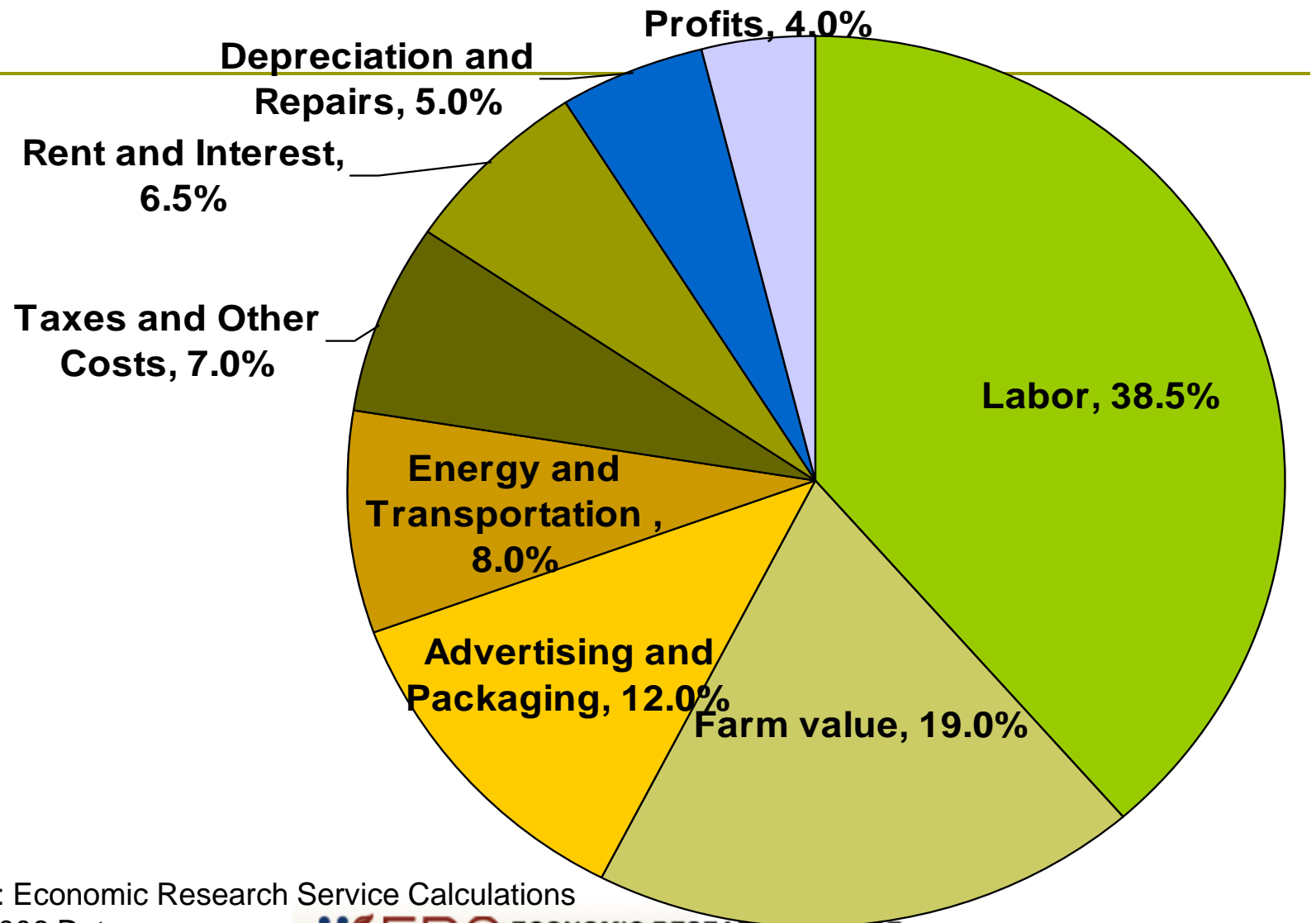
PPI for Retail Grocery Department Margins



Sources of Retail Price Changes

- Changes in Costs
 - Cost of Goods Sold
 - Operating Costs
- Changes in Retail Market Competition
 - Number of retailers in a market
 - Type of retailers
 - Specialization
 - Differentiation
- Changes in Consumer Demand

Where a Consumer Dollar Spent on Food Goes



Source: Economic Research Service Calculations
using 2006 Data
June 23, 2009

Objectives

- Model the magnitude of pass-through
 - Identify mitigating factors
 - Identify differences across food groups
- Estimate time to pass-through by food category

Motivation- an Egg Example



Sources: USDA, BLS

June 23, 2009

U.S. Egg Price Trends, 2002-2008

Year	Farm -Level Price	Percent Change	Wholesale Price	Percent Change	Retail Price	Percent Change
2002	\$0.61	0	\$0.67	0	\$1.03	11
2003	\$0.75	23	\$0.88	31.3	\$1.24	20.6
2004	\$0.70	-6.7	\$0.82	-6.8	\$1.34	7.6
2005	\$0.54	-22.9	\$0.66	-19.5	\$1.22	-9.1
2006	\$0.57	5.6	\$0.72	9.1	\$1.31	7.2
2007	\$0.93	63.2	\$1.14	58.3	\$1.68	28.3
2008	\$1.07	15.1	\$1.28	12.3	\$1.99	18.7

Retails foods covered in this analysis

- Beef
- Pork
- Poultry
- Eggs
- Milk
- Bread
- Oranges
- Lettuce

Data

- Monthly Change in PPI and CPI for Ag, Energy and Food Items
 - Eight Retail Foods
 - Related Farm and Wholesale PPIs
 - Crude Oil and Gasoline PPIs
- Grocery Store Wage Data (Current Employment Statistics)
- Time Period: 1972-2008

Multi-Stage Price Transmission (1)

- Cattle, Hogs, Poultry, Milk, Eggs
 - Corn, Soybeans, and Crude Oil
 - Allow for up to 24 months of lags
 - Account for Autocorrelation in time series
- Retail Meats, Milk, Eggs
 - Cattle, Hogs, Poultry, Milk, Eggs
 - Wholesale Gasoline and Grocery Store Wages
- Time Lags and Autocorrelation
 - Allow for up to 24 months of lags for RH-side
 - Account for autocorrelation in error terms

Multi-Stage Price Transmission (2)

- Wheat Flour
 - Wheat and Crude Oil
- Bread
 - Wheat Flour, Wholesale Gasoline, Grocery Store Wage
 - Allow for up to 24 months of lags
 - Account for Autocorrelation in time series
- Time Lags and Autocorrelation
 - Allow for up to 24 months of lags for RH-side
 - Account for autocorrelation in error terms

Farm-Level Results Summary

Dependent Variable	Corn		Soybeans		Crude Oil	
	Pass-Through Rate (percent)	Time to Pass Through (months)	Pass-Through Rate (percent)	Time to Pass Through (months)	Pass-Through Rate (percent)	Time to Pass Through (months)
Cattle	8	2 to 9	6	4 to 9	10	2
Hogs	15	3	Negative	4 to 6	5 to 10	9
Poultry	16	4	6	2 to 4	3 to 4	9
Eggs	27	6	Negative	3 to 5	3 to 5	2 to 4
Milk	4	2 to 4	5	6	Negative	4 to 6

Wheat Results

	Wheat		Crude Oil	
Dependent Variable	Pass-Through Rate (percent)	Time to Pass Through (months)	Pass-Through Rate (percent)	Time to Pass Through (months)
Wheat Flour	41	1 to 2	3	4

Retail Summary (1)

Dependent Variable (Retail Prices)	Farm-Level Price		Energy		Grocery Store Wages	
	Pass-Through Rate (percent)	Time to Pass Through (months)	Pass-Through Rate (percent)	Time to Pass Through (months)	Pass-Through Rate (percent)	Time to Pass Through (months)
Beef	6 to 18	1 to 2	Negative	3	Not Stat. Significant	----
Pork	2 to 4	1 to 3	2	2	5 to 10	8 to 21
Poultry	6 to 8	1 to 2	3	2	Negative	7
Eggs	5 to 8	3 to 5	5	6 to 9	Negative	4 to 17

Retail Summary (2)

Dependent Variable (Retail Prices)	Farm-Level Price		Energy		Grocery Store Wages	
	Pass-Through Rate (percent)	Time to Pass Through (months)	Pass-Through Rate (percent)	Time to Pass Through (months)	Pass-Through Rate (percent)	Time to Pass Through (months)
Milk	5 to 18	1 to 5	2	2 to 3	Not Stat. Significant	----
Bread	2 to 6	1 to 6	2	1 to 4	8 to 10	17 to 20
Oranges	11	1 to 2	Not Stat. Significant	----	10 to 15	2 to 13
Lettuce	16	1 to 2	Not Stat. Significant	----	Not Stat. Significant	----

Commodity to Retail Pass-Through (1)

- Corn to Retail Beef: 1.5 percent
 - 2008: Corn up 60 percent-Beef up 0.9 percent
 - Explains about 20 percent of actual retail beef price increase
- Corn to Retail Poultry: 1.3 percent
 - 2008: Corn up 60 percent-Poultry up 0.8 percent
 - Explains about 15 percent of actual retail poultry price increase

Commodity to Retail Pass-Through (2)

- Corn to Retail Eggs: 2.2 percent
 - 2008: Corn up 60 percent-Eggs up 1.3 percent
 - Explains about 9 percent of actual retail egg price increase
- Corn to Retail Milk: 2 percent
 - 2008: Corn up 60 percent-Milk up 1.2 percent
 - Explains about 20 percent of actual retail milk price increase

Commodity to Retail Pass-Through (3)

- Wheat to Bread: 1.4 percent
 - 2008: Wheat up 160 percent-Bread up 2.2 percent
 - Explains about 16 percent of actual retail bread price increase
- Corn to Retail Milk: 2 percent
 - 2008: Corn up 60 percent-Milk up 1.2 percent
 - Explains about 20 percent of actual retail milk price increase

Summary

- ❑ Food and energy commodity price changes to farm and wholesale prices
 - Time: 2 to 9 months
 - Pass-through: 2 to 41 percent depending on the product in question.
- ❑ Farm and wholesale prices change to retail prices
 - Time: 1 to 6 months
 - Pass-through: 2 to 18 percent.
- ❑ Implies that commodity price changes take 4 to 27 months to pass through to retail prices and are passed through at rates ranging from less than one-half percent to nearly 7 percent.

Future Research Extensions

- More Food Categories
- Additional Explanatory Variables
- Test for asymmetric adjustment
 - Price increases vs. decreases
- Sub-time period analysis
 - Has the relationship changed over time?
- Are there key threshold levels at which commodity price change begin to impact retail prices in a significant way?