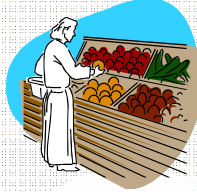


CHAPTER 2: TOPICS OF DISCUSSION

- Indices and nominal versus real values
- What is the Food and Fiber Industry
- Changing complexion of production agriculture
 - Physical structure
 - Productivity
 - Profitability
 - Financial structure
- Sectors within the Food and Fiber Industry
 - Farm input suppliers
 - Food processors, wholesalers and retailers
 - Value added process

An illustration of a person wearing a white lab coat or uniform, standing next to a wooden crate filled with various fruits like apples, oranges, and grapes. The person appears to be inspecting or handling the produce. The illustration is set against a light blue circular background.

THE FOOD AND FIBER INDUSTRY...

Consists of those business entities that are involved in one fashion or another with the supply of food and fiber to consumers.



FOOD & FIBER INDUSTRY

- (1) FARM INPUT SUPPLY SECTOR
(e.g., John Deere, Ralston-Purina)
↓
- (2) FARM SECTOR
↓
- (3) PROCESSION & MANUFACTURING SECTOR
(e.g., Tyson Foods, Del Monte, Swift)
↓
- (4) WHOLESALE & RETAIL SECTOR
(e.g., Sysco, Kroger, HEB)
↓
- (5) CONSUMER (us)

1 out of every 6 jobs is tied to the food and fiber industry



Responsible for roughly 12 to 15 percent of GDP

Net Farm Income (\$ billion)

2004	2005	2006	2007	2008	2009
85.9	78.7	58.5	70.9	87.1	57.0

← 30% decline

Value of Crop Production (\$ billion)

2004	2005	2006	2007	2008	2009
124.5	114.4	118.9	150.9	182.5	164.2

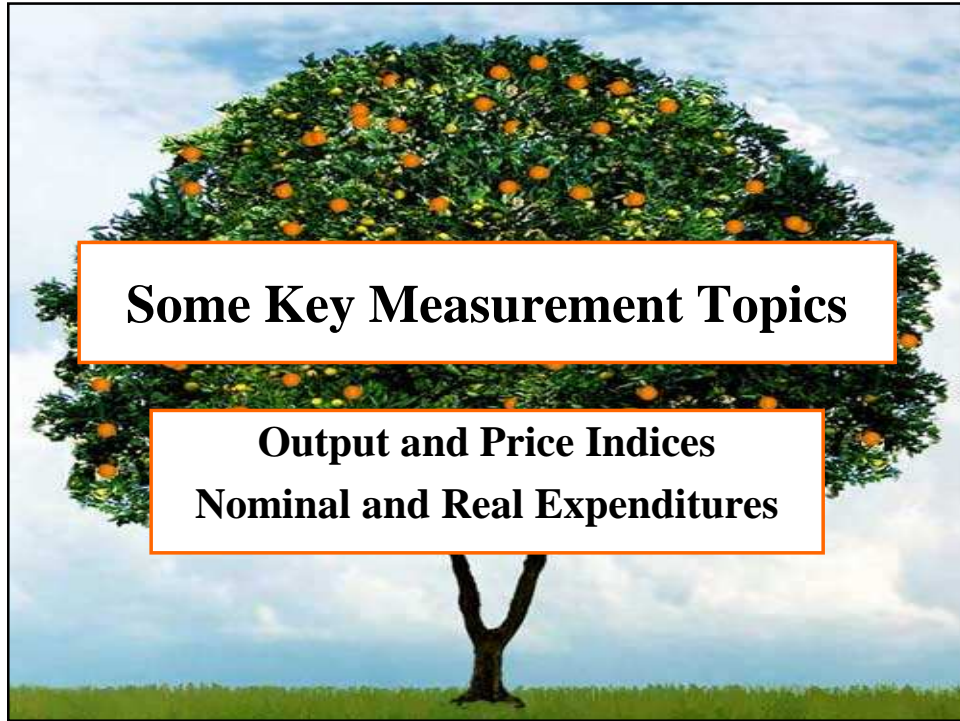
← 18% decline

Value of Livestock Production (\$ billion)

2004	2005	2006	2007	2008	2009
124.4	126.5	119.4	138.5	139.7	117.4

← 22% decline

Source: Economics Research Service, USDA (www.ers.usda.gov)



Indices

- ❖ Index – a percentage comparison from a fixed point of reference or benchmark.
- ❖ with an index, economists can more easily describe how much, say wheat output for example, has increased or decreased relative to the benchmark or base period.

CPI ⊕ Consumer Price Index

WPI ⊕ Wholesale Price Index

Index of prices received or paid by producers

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Output and Price Indices

Year	Apple Production		Price of apples	
	(1000 short tons)	Output Index	(\$/pound)	Price index
1985	3,957	0.819	\$0.685	0.952
1990	4,828	1.000	\$0.719	1.000
1997	5,162	1.069	\$0.907	1.261

1990 is the base year

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$1.069 = 5,162 \div 4,828$
Output 6.9% higher in 1997 than it was in 1990....

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1990 is the base year

$1.069 = 5,162 \div 4,828$
Output 6.9% higher in 1997 than it was in 1990....

$1.261 = 0.907 \div 0.719$
Price 26.1% higher in 1997 than it was in 1990....

Index Numbers of Prices Received, United States, December 1999.
with Comparisons

Index	1910-14=100				1990-92=100		
	1998		1999		1998		1999
	Average	Dec	Nov	Dec	Dec	Nov	Dec
All Farm Products	639	625	*591	579	98	93	91
All Crops	500	492	*440	436	100	89	88
Food Grains	325	321	*283	263	101	*89	83
Feed Grains & Hay	363	319	*274	279	89	77	78
Cotton	517	512	*378	369	100	*74	72
Tobacco	1263	1665	*1587	1657	110	*105	109
Oil-Bearing Crops	554	556	*446	434	102	*82	79
Fruit & Nuts	716	661	*829	673	95	*119	96
Commercial Vegetables	698	746	*646	697	112	*97	104
Potatoes & Dry Beans	540	479	*474	475	95	*94	94
Other Crops	493	532	532	532	108	108	108
Livestock & Products	768	741	751	728	97	98	95
Meat Animals	1021	674	*884	888	66	87	87
Dairy Products	799	1112	*879	762	139	*109	95
Poultry & Eggs	282	336	321	311	119	114	110
Food Commodities					98	*97	93

* Revised.

Selected Index Numbers for Prices Received and Paid, 1990-92=100, by Months, United States, 1998 and 1999

Month	Index of Prices Received				Index of Prices Paid					
	All Farm		All Crops		Livestock and Products		All Production Items			
	1998	1999	1998	1999	1998	1999	1998	1999		
Jan	103	97	109	98	95	96	117	115	116	111
Feb	101	96	109	98	94	94	117	115	115	110
Mar	102	96	111	99	95	95	116	115	114	110
Apr	104	96	114	103	95	90	116	115	114	111
May	103	99	112	105	96	93	116	115	114	111
Jun	102	98	106	101	98	95	115	115	113	111
Jul	102	95	107	95	96	94	115	115	112	111
Aug	101	99	103	100	99	97	114	115	111	111
Sep	99	97	100	95	98	98	113	116	110	112
Oct	99	91	100	88	98	96	114	117	110	113
Nov	99	93	101	89	97	98	114	117	110	113
Dec	98	91	100	88	97	95	114	117	110	114

REAL VERSUS NOMINAL VALUES

- Consider economic measures such as prices, interest rates, expenditures, disposable income.
- Nominal Values refer to values for which no adjustments to inflation have been made.
- Real Values refer to values for which adjustments to inflation have been made.
- A popular measure of inflation is the Consumer Price Index (there are other indices, however).

$$\frac{\text{Nominal Value}}{\text{Price Index}} = \text{Real Value}$$

Nominal and Real Expenditures for Food Eaten Away From Home

Year	Nominal Expenditures (billion dollars)	CPI 1982-84=1.00	Real Expenditures (billion dollars)
1980	120.296	0.824	145.990
1985	168.831	1.076	156.906
1990	248.464	1.307	190.102
1995	302.419	1.569	198.437

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1982-84
average is
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Nominal and Real Expenditures for Food Eaten Away From Home

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Page 15

1982-84 average is the base year for the CPI

CPI was 56.9% higher in 1995 than it was in 1982-84 period

Nominal and Real Expenditures for Food Eaten Away From Home

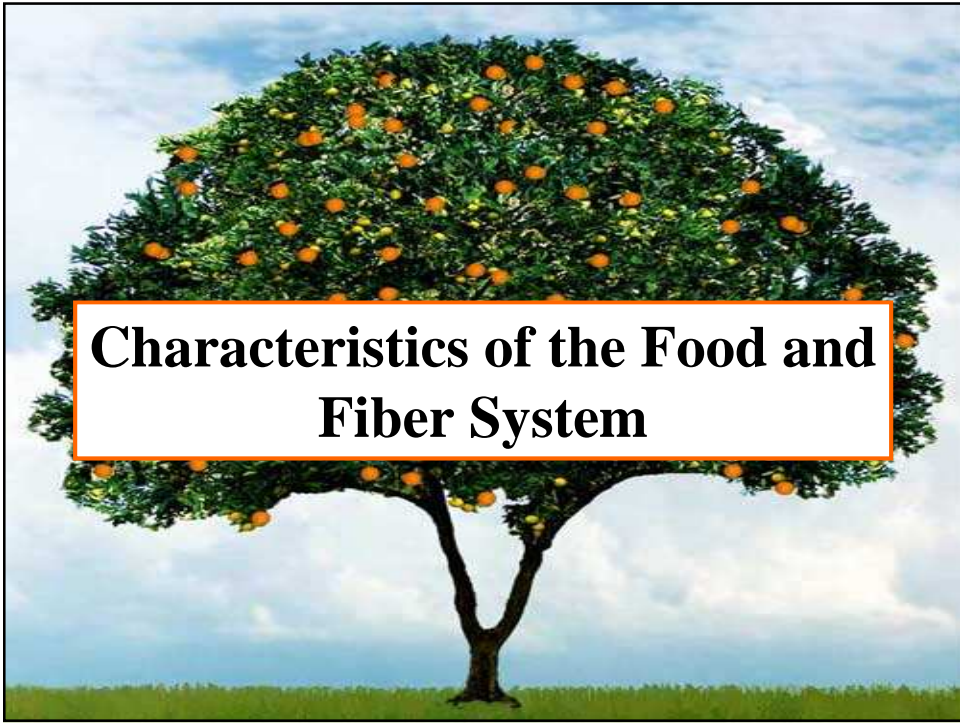
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Page 15

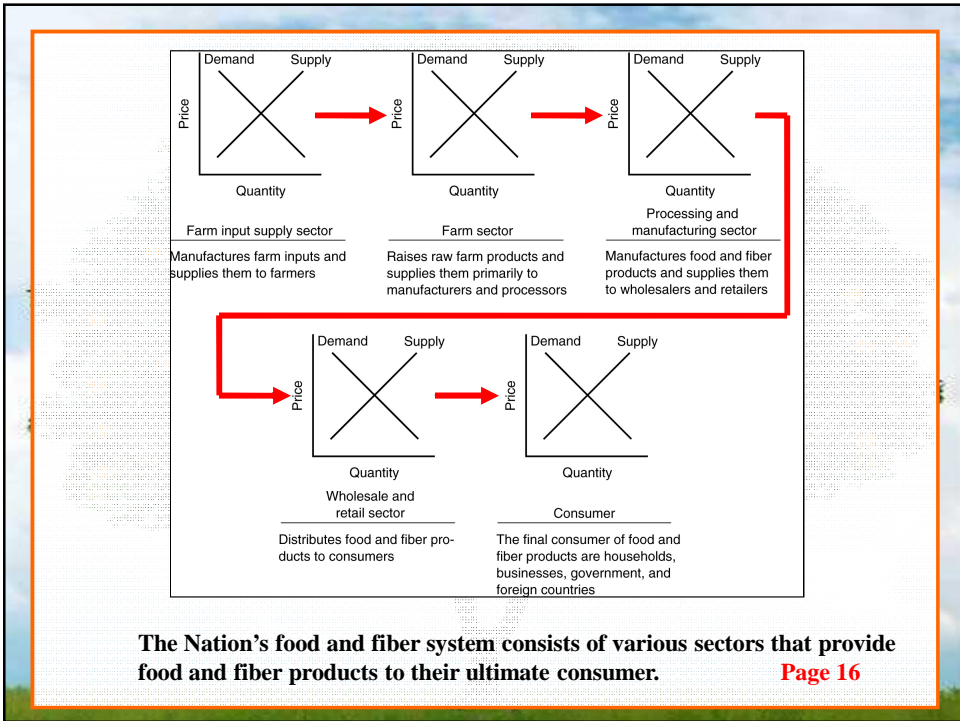
1982-84 average is the base year for the CPI

CPI was 56.9% higher in 1995 than it was in 1982-84 period

$198.437 = 302.419 \div 1.569$
The increasing CPI eroded the purchasing power of the dollar....



Characteristics of the Food and Fiber System



The Nation's food and fiber system consists of various sectors that provide food and fiber products to their ultimate consumer. **Page 16**

Changing Complexion of Farming

□ Physical structure

- ✓ Fewer number of farms but larger-sized farms
- ✓ Increasing use of capital relative to labor
- ✓ Increasing productivity or output per unit of input

□ Financial structure and performance

- ✓ Nominal net farm income growth offset by inflation
- ✓ Declining debt use strengthens equity position
- ✓ Recovering real estate values after sharp declines during the financial crises in the mid-1980s

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Important Facts

- Number of farms roughly 2.1 million at present
- Peak 1935—6.8 million farms
- Average size of the US farm between 400 and 500 acres today
- Since WWII, average farm size has doubled

Fig. 2.2A Trends in the number of Farms,
1990 to 2007

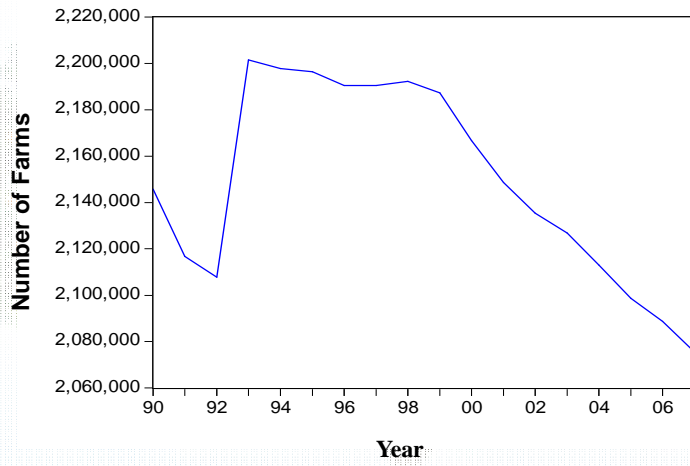
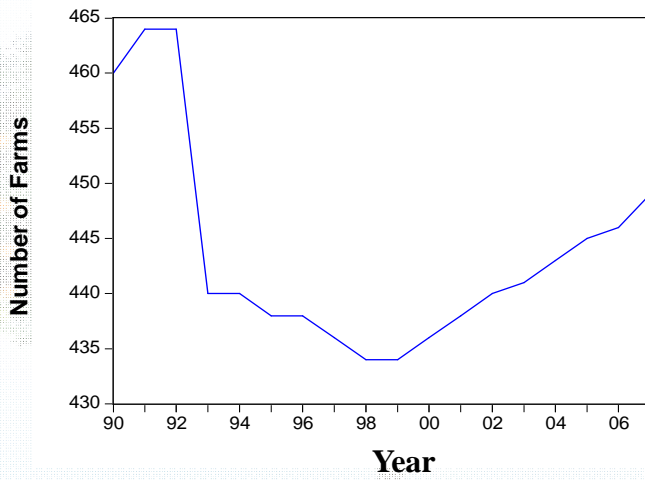


Fig. 2.2B Trends in the average size of farms,
1990 to 2007



Specialization, Diversification, Organization, and Contracting

- Share of the 50,000 largest farms (2%) account for roughly 50% of total sales
- 56% of US farms have sales < \$10,000
- Concentration of production may be more of a critical issue than the decline in the number of farms; 10% of U.S. farms account for 75% of value of production
- The number of farms has been holding steady at 2.1 million for the past 10 years

Specialization, Diversification, Organization, and Contracting

- US farms tend to be specialized rather than diversified
- About half of US farms produce one commodity
- $\frac{3}{4}$ of farms with sales > \$0.5 million produce no more than three commodities
- 60 percent of all farms are comprised of retired operators and operators who also work off the farm
- Average age of farm operator is in the mid 50s today, 48 in 1940

Specialization, Diversification, Organization, and Contracting

- Corporate farms versus family farms
- Family-owned farms are NOT losing their share of US agriculture to non-farm corporations
- US farms are most organized as individual operations; farms organized as partnerships are about 5 percent of US farms; farms organized as corporations are roughly 3 percent of US farms
- But partnerships and corporations account for roughly 40 percent of the value of production

Specialization, Diversification, Organization, and Contracting

- Over the past 40 years, farmers have become LESS dependent on terminal markets and spot pricing
- Roughly 10 percent of farms today rely on production and marketing contracts, and these farms account for 52 percent of agricultural production
- 90 percent of US farms today have no production and marketing contracts

A Note on Farm Inputs

- Land, Labor, Capital, Materials
- Capital refers to durable equipment and structures
- Labor—Hired and Self-Employed
- Materials—Energy, chemicals, and purchased services

A Note on Farm Inputs

- Total farm input, in the aggregate, has remained relatively stable since WWII
- Labor on the decline, materials on the rise
- Capital substituted for labor; use of capital inputs peaked around 1980 and then declined from 1981 to 1995; since 1996 capital has leveled off

Fig. 2.3 A Index of total farm inputs used in agricultural production, 1948 to 2006 (1996=1.00)

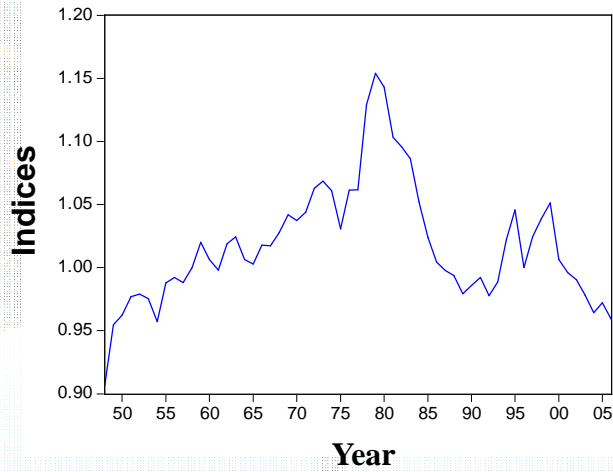
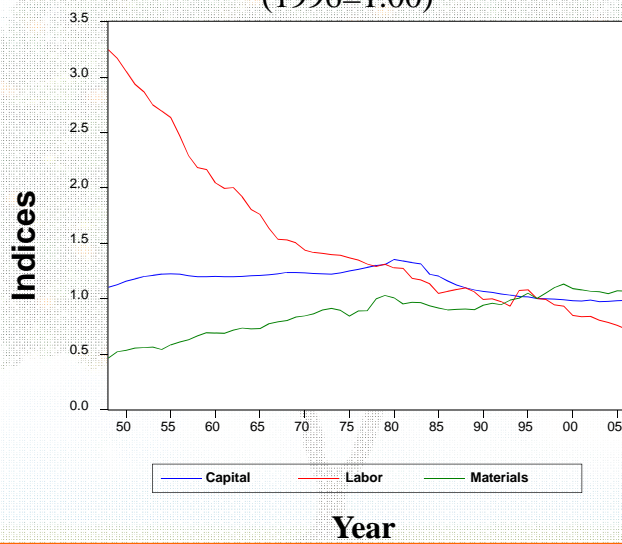


Fig. 2.3B Index of capital, labor, and materials used in agricultural production, 1948 to 2006 (1996=1.00)



A Note on Productivity

- Productivity defined as output per unit of input
- Productivity has increased dramatically since WWII
- Output has been on the rise due primarily to development and use of technology and biotechnology (e.g. BST)
- Growth rates in livestock and crop output have been about the same; average growth rate is 2 percent per year

A Note on Productivity

- US farmers have adopted widely genetically-engineered (GE) crops since their introduction in 1996
- Examples—soybeans and cotton genetically-engineered with herbicide-tolerant traits; cotton and corn with insect-resistant traits

Figure 2.4. Index of agricultural productivity, 1948 to 2006 (1996=1.00)

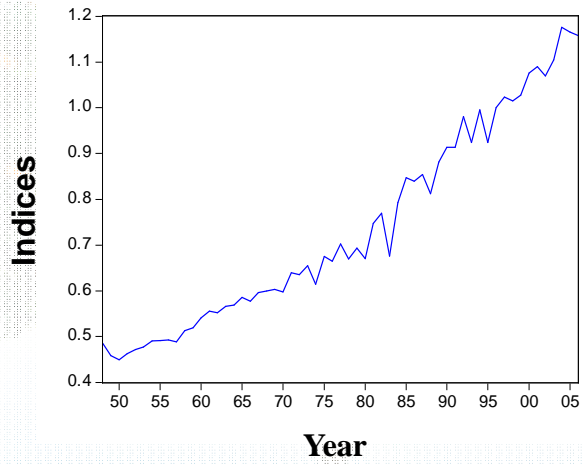


Figure 2.5 A Index of total output from the farm sector, 1948 to 2006 (1996=1.00)

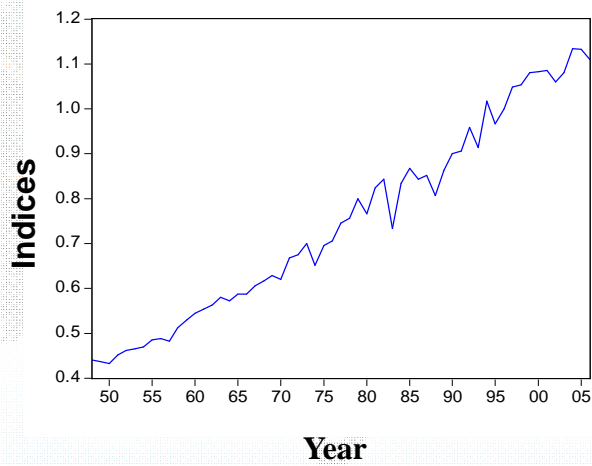


Figure 2.5 B Index of output associated with livestock products, 1948 to 2006 (1996=1.00)

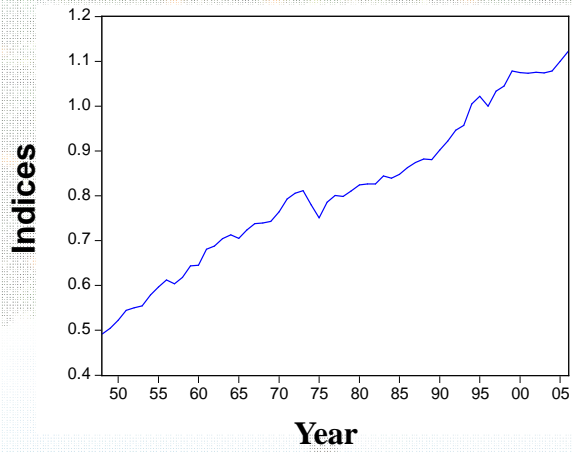
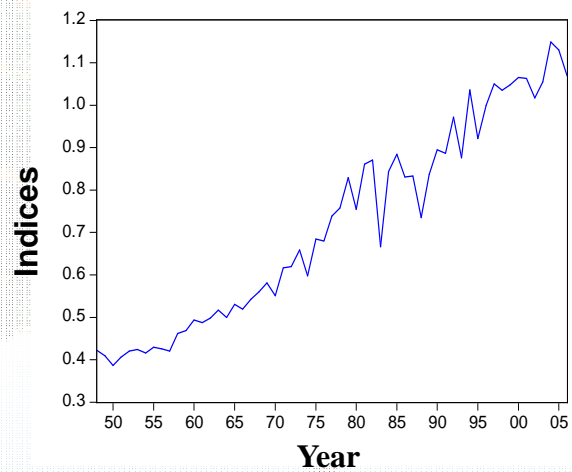


Figure 2.5 C Index of output associated with crops, 1948 to 2006 (1996=1.00)



Farm Profitability

- Cash receipts from farm marketings
- + Government payments
- + Other income from farm sources
- = **Gross farm income**
- Production expenses
- = **Nominal net farm income**
- ÷ Broadly-based price deflator
- = **Real net farm income**

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Figure 2.6 A Gross farm income and production expenses, 1949 to 2007

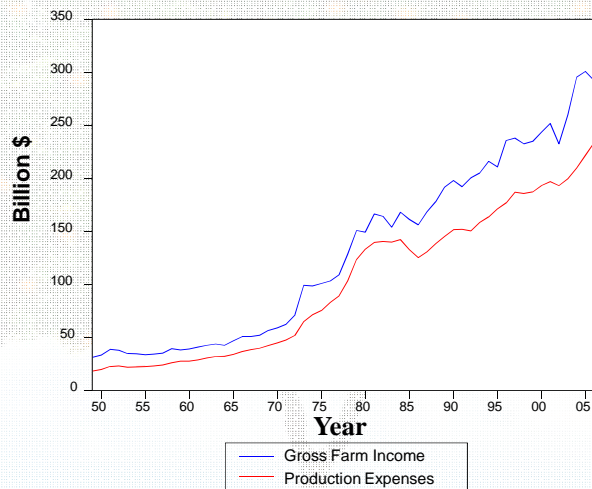
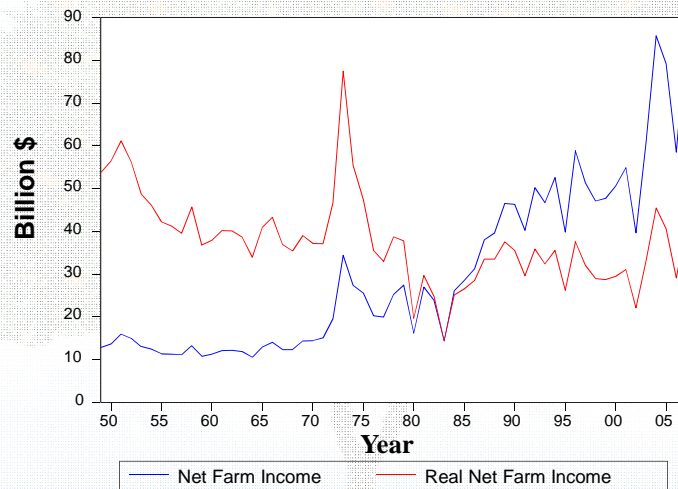


Figure 2.6 B Nominal and Real Net Farm Income, 1949 to 2007



Financial Structure

- Value of real estate assets**
- + Value of nonreal estate assets**
- + Value of financial assets**
- = Total assets**
- Total liabilities or debt**
- = Equity or net worth**

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Figure 2.7 A Real Estate Assets and Non-real Estate Assets 1960 to 2006

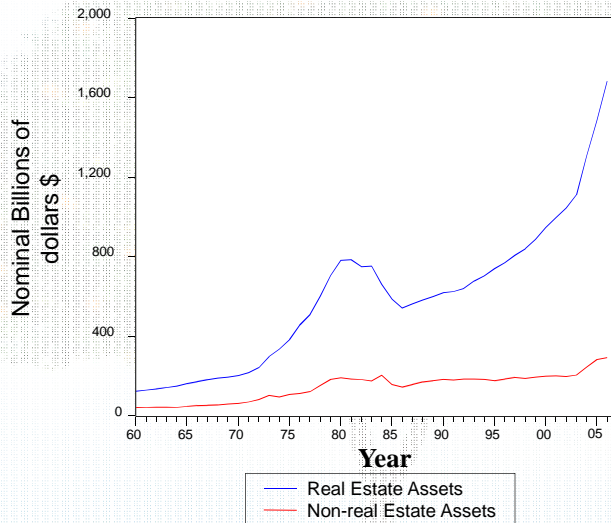


Figure 2.7 B Farm assets and liabilities, 1960 to 2007

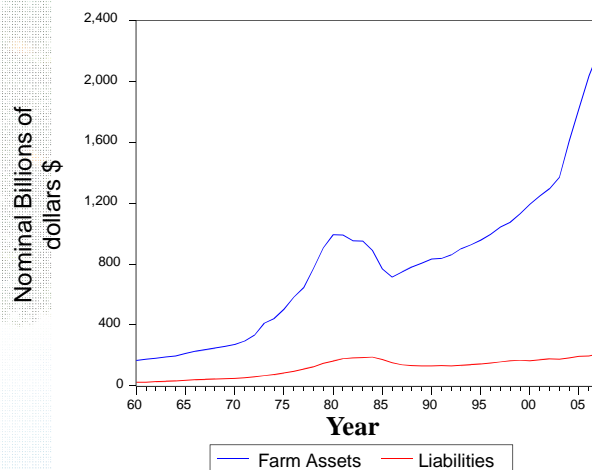


Figure 2.7 C Equity associated with the farm sector, 1960 to 2007

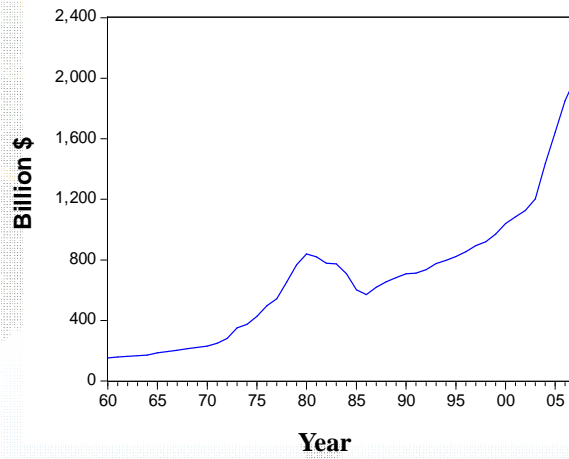


Figure 2.7 D Debt-to-asset ratio associated with the farm sector, 1960 to 2007

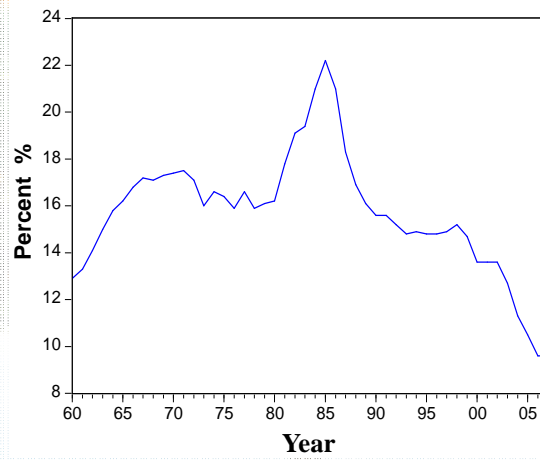
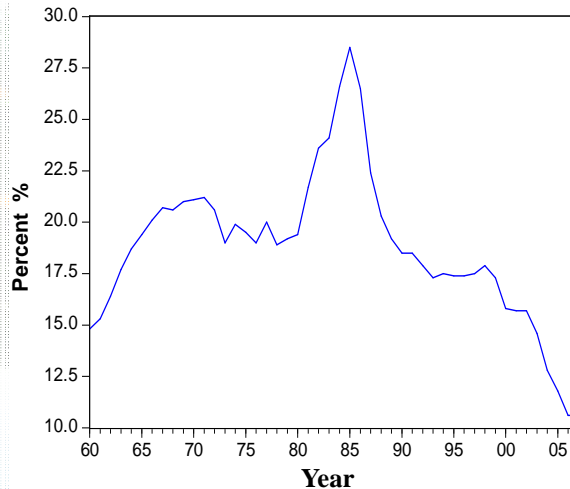


Figure 2.7 E Debt-to-equity ratio associated with the farm sector, 1960 to 2007



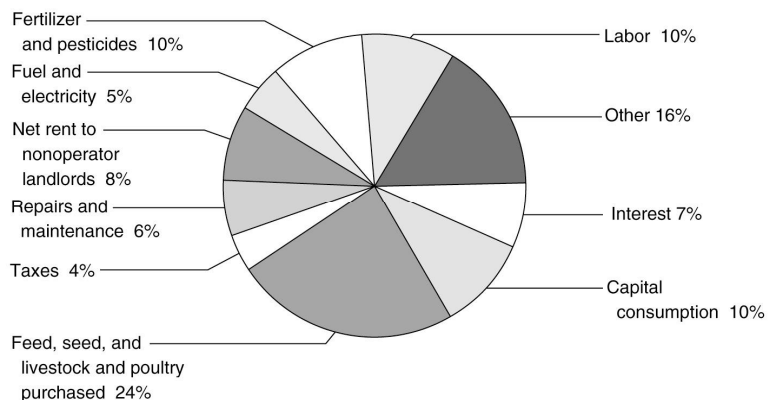
A Note on Profitability

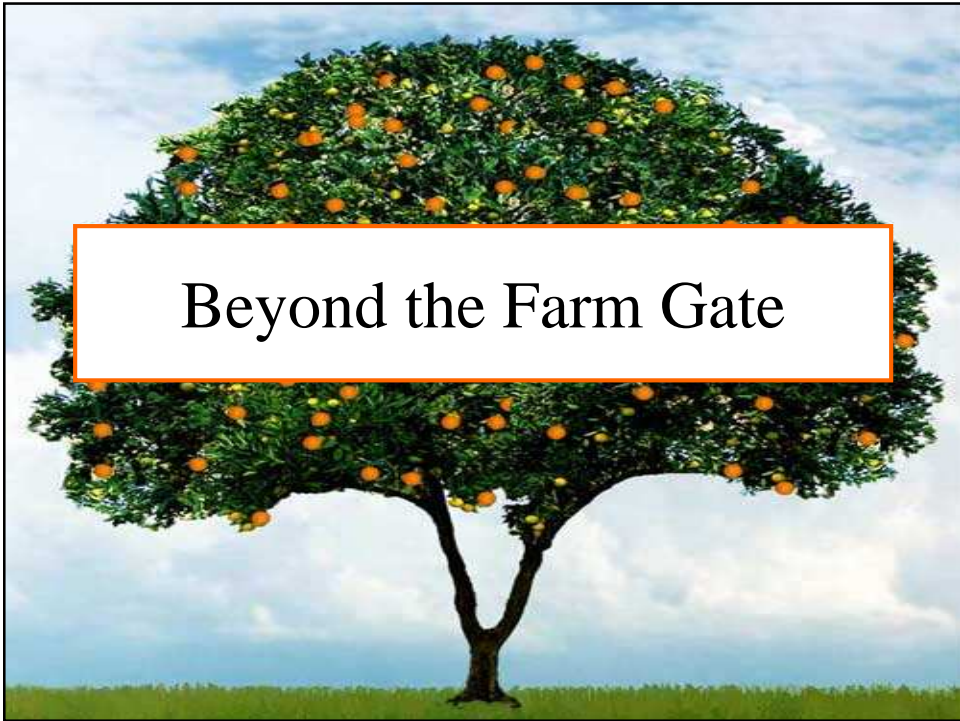
- Nominal net farm income was about \$57 billion in 2009; over the period 2004 to 2009, range \$58.5 billion (2006) to 87.1 billion (2008)
- Since the 1930s, the worst year in terms of lowest real net farm income was 1983
- In 2007, farm assets were roughly \$2.2 trillion; farm liabilities were on the order of \$200 billion; thus equity in the farm sector was \$2 trillion, largely due to real estate assets in 2007.

A Note on Profitability

- Debt-to-asset ratio peaked at 22 percent in 1985; currently this ratio is about 10 percent
- Debt-to-equity ratio peaked at 28 percent in 1985; currently this ratio is about 10 percent

Relative Importance of Farm Input Expenditures



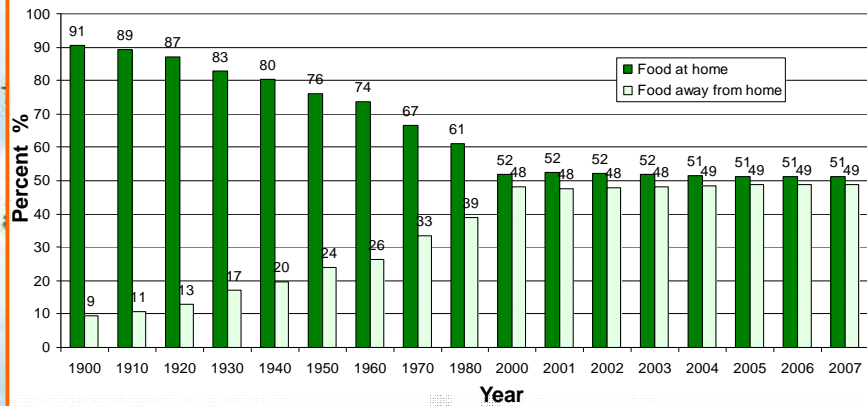


Beyond the Farm Gate

TABLE 2.4 Value Added for a Loaf of Bread

Product	Type of Firm	Product Sold	Paid	Received	Value Added
Wheat	Farm	Wheat	—	\$.08	\$.08
Milling	Miller	Flour	\$.08	\$.50	\$.42
Baking	Bakery	Bread in bulk	\$.50	\$.72	\$.22
Marketing	Store	Distributed bread	\$.72	\$1.02	\$.30
					\$1.02

Figure 2.9 Share of the food dollar for food eaten at home and for food eaten away from home.



Source: USDA Economic Research Service

Figure 2.10 Percentage of disposable personal income spent on food, 1929 to 2007

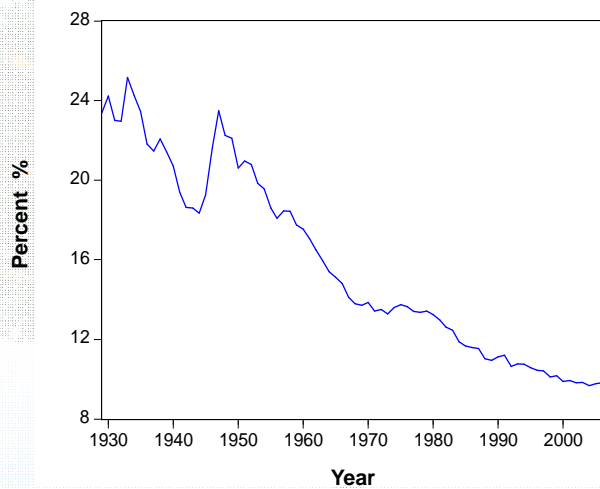


Figure 2.11 Illustration of Engel's Law using annual data from 1929 to 2007

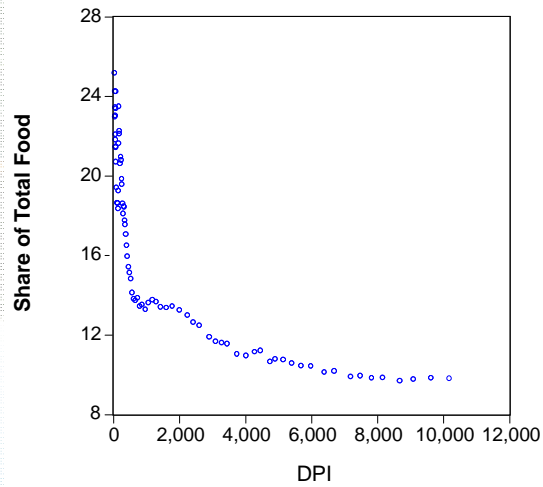
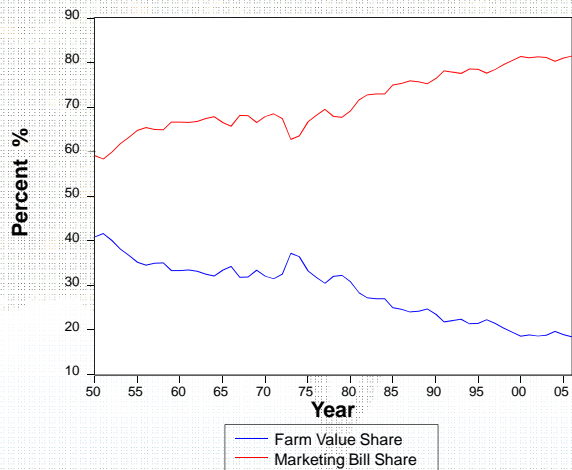
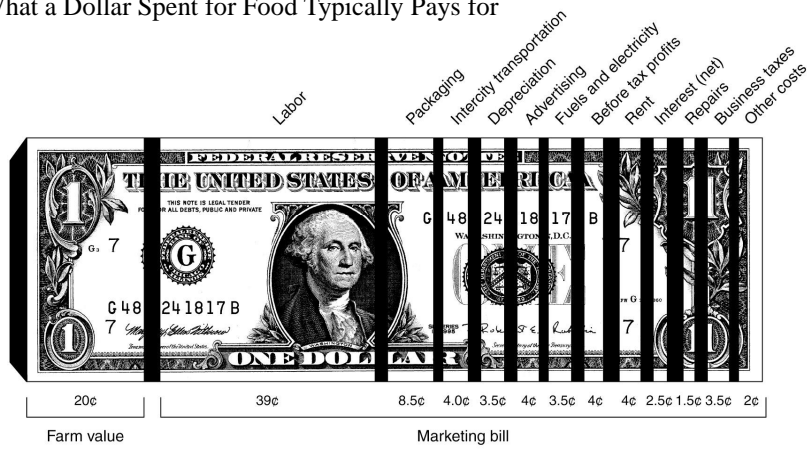


Figure 2.14 The marketing bill share and the farm value share of consumer food expenditures, 1950 to 2006



What a Dollar Spent for Food Typically Pays for



Only 20 cents of each dollar spent on food products goes to farmers and ranchers...