



Updating Concepts and Methods for National Accounts: The U.S. Experience

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Motivation for Change

- Tracking an ever changing economy crucial for:
policymakers
 - Federal, state, and local government budgets
 - Macroeconomic, tax, trade, and regulatory policy
 - Business planning
 - Corporate and individual investments
 - Allocation of \$190 billion federal funds



Motivation for Change

- The need to provide these users with accurate, timely, relevant, and consistent estimates:
- To address these BEA has regularly updated its estimates by making changes such as the:
 - Introduction of hedonic and other quality-adjusted prices
 - Use of chain indexes
 - Development of new measures of finance and insurance
 - Improved measures of services
 - Updated concepts and measures for profits and wages and salaries
 - Improved industry accounts



Motivation for Change

- To address these BEA has regularly updated its estimates by making changes such as the:
 - More accurate and more detailed regional data
 - More accurate international trade and investment data
 - Better integrated estimates across BEA, BLS, and FRB accounts.



The U.S. Experience – Price Indexes

- Today's talk will focus on changes in price and output measurement.
- As a result of these changes, we have more accurate and unbiased estimates of inflation, productivity, and growth appropriate to the period of analysis
- Use of chain, or superlative, indexes widespread
 - BEA's national, international, regional, and industry accounts
 - FRB Industrial production, Census International Trade, and BLS productivity
 - Recommended by SNA 1993



The U.S. Experience – Quality Adjustment Methodology

- Better understanding of the role of technology
 - Hedonics used first for computers
 - Expanded to photocopiers, housing
- Major expansion in difficult-to-measure services prices
 - Medical care and PPI services expansion



International Experience

- SNA and increasing adoption of chain indexes
- Increasing use of hedonics and quality adjustment in GDP
 - OECD manuals for ICT
 - Eurostat hedonic study
 - Forthcoming PPI and CPI manuals
- Improved understanding of differences in growth
- In general, smaller trend impact than United States
 - Computers
 - Larger impact on relative growth rates of components and from exchange rate, oil, and other price shocks



International Trends – Adoption of Hedonics

	Consumer Prices	Producer Prices	National Accounting
Australia			U.S. computer indexes
Canada	computer equipment		computers
Denmark			U.S. computer indexes
Finland	cars		
France	computers, clothing, household appliances, and books		computers
Germany	computers		
Japan	computers	technology products	computers
Korea		technology products	
Norway		computers	
Sweden	clothing	computers	computers
U.S.	clothing, computers, rent & new houses	technology products	computers, semiconductors, homes, photocopy machines

Source: OECD. 2002. *Main Economic Indicators: Comparative Methodological Analysis Consumer and Producer Price Indices*. vol. 2002. sup. 2. pp. 51-53, 84.
Linz, Stefan and Gudrun Eckert. 2002. "Introducing Hedonic Methods in Price Statistics." *DeStatis*.



Lessons Learned: The Need to Make the Case

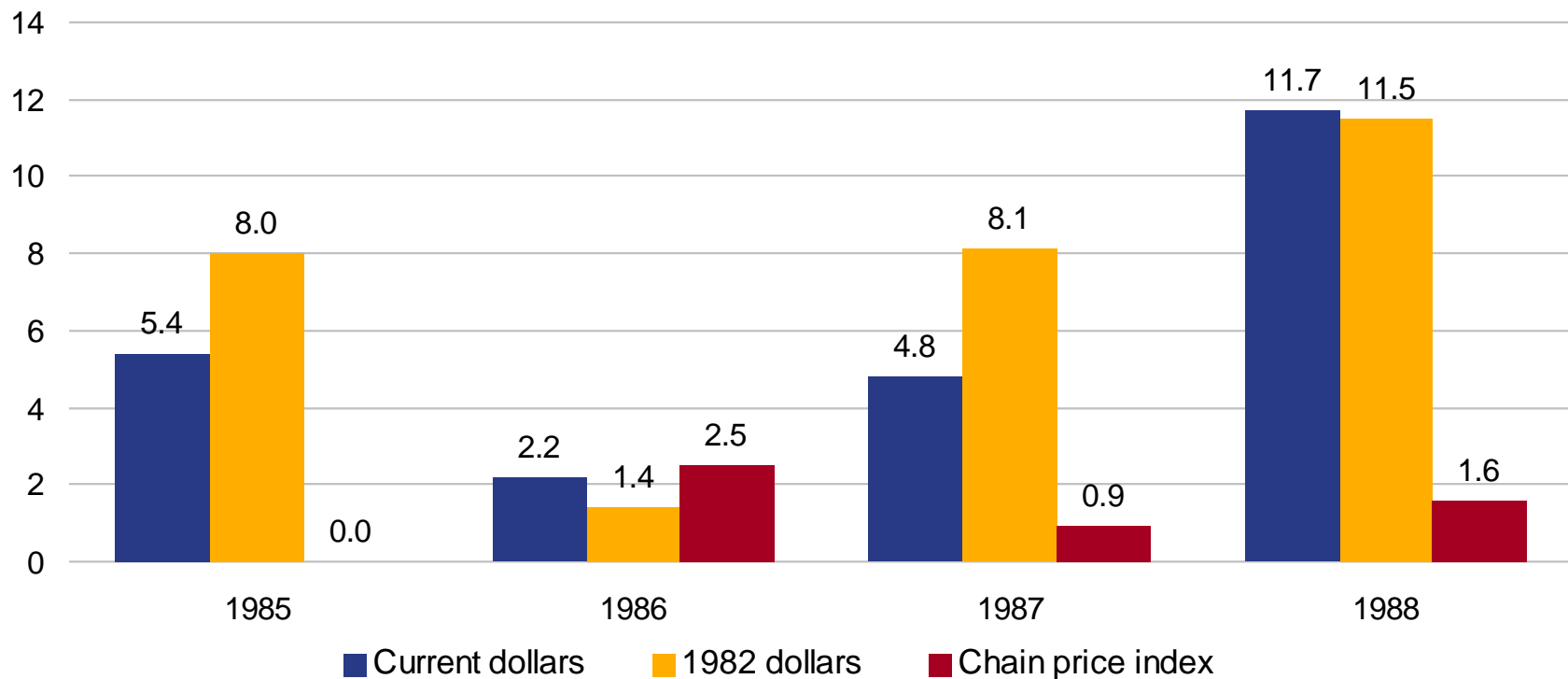
- Vetting the methods, and data with professionals (including own staff)
- Educating users
- Developing new tables and analytic devices to assist users with new measures
- Responding with facts and logic



Introduction of Chain-type Measures

Producers' Durable Equipment

(Percent change from preceding period)

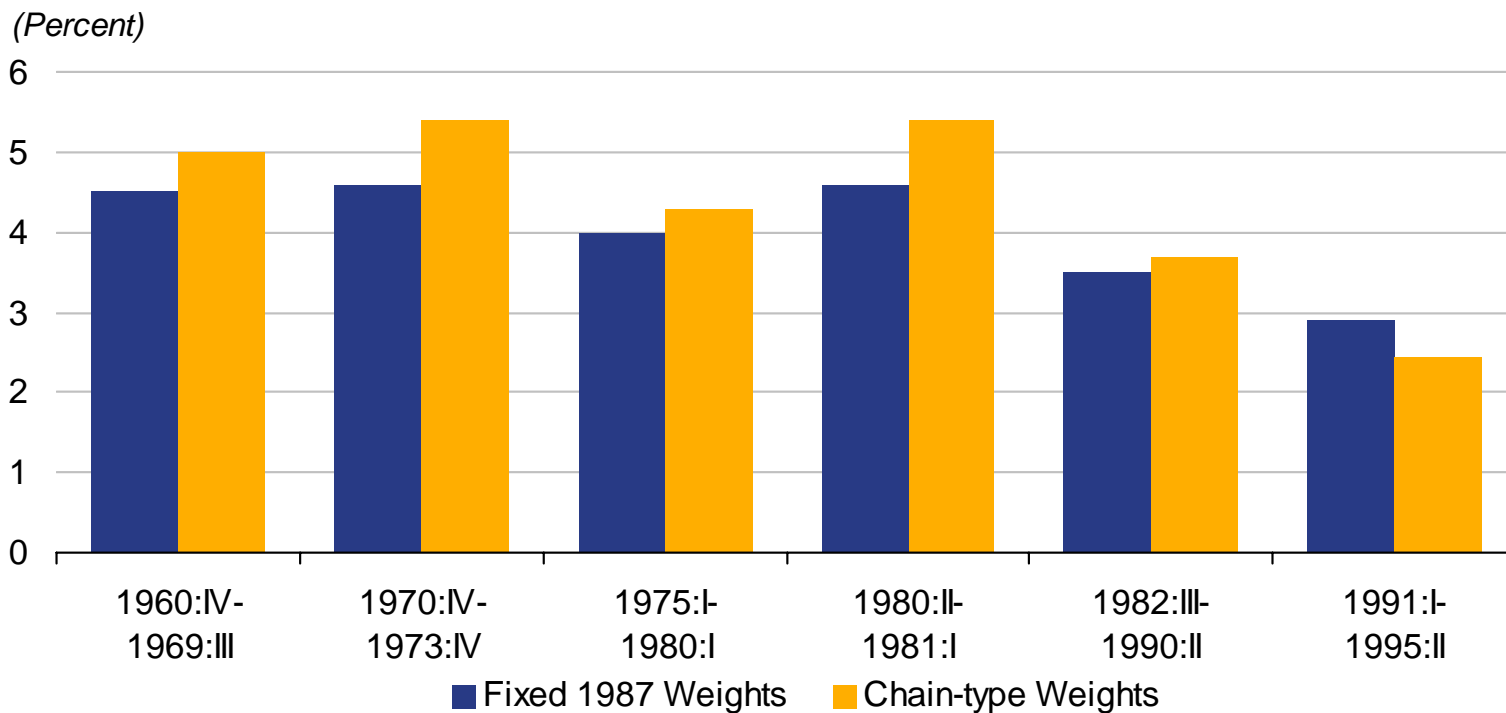


Source: *Survey of Current Business*, July 1989.



Chain-type Measures

Rates of Change in Real GDP: Comparison of Alternative Measures During Economic Expansions



Source: Historical BEA tables.



Moving to Chain-Type Indexes – Reaction

- “When Two Plus Two Equals Five” *Journal of Commerce*, July 1995
 - “A wise man once claimed that the main activity of government was correcting its own mistakes.”
- “How Not to Measure the U.S. Economy” *Business Week*, Jan. 1996
 - “The new GDP benchmark...lowers economic growth rates, moving us further away from the truth instead of closer to it.”
- “Lies, Damned Lies, and the U.S. Commerce Department’s New Way of Measuring GDP” *Financial Times*, Jan. 1996
 - “The main effect of the new measure is to depress estimates of recent economic growth while significantly boosting the economy’s apparent performance in previous decades.”



Lessons Learned: The Need to Proceed with Ambition But With Care

- Appropriate data is scarce
- The results need to be robust
- The computer requirements are large
- The needs for other programs need to be considered:
 - Concepts
 - Methods
 - Source data
 - Consistency



Reaction to Hedonics

- “America’s Hedonism Leaves Germany Cold”
Financial Times, Sept. 2000
 - “U.S. methods of price indexing, particularly for computer-related products, exaggerate output compared with European rivals.”
- “The Productivity Mirage” *The New Yorker*, Nov. 2000
 - “Are computers really that important?”



Lessons Learned: The Need for Robust Results

Author ¹	Computer type	Time period	Prices: Annual rates of change
Chow	mainframe	1960–65	-21
Triplett	mainframe	1953–72	-27
Cole et al.	mainframe	1972–84	-19
Cartwright	mainframe	1972–84	-14
Gordon	mainframe	1951–84	-22
Cohen	personal computer	1982–87	-25 to -27
Berndt and Griliches	personal computer	1982–89	-23 to -25
Berndt, Griliches, and Rappaport	mobile personal computer	1989–92	-23 to -24
	desktop personal computer	1989–92	-31 to -32
Nelson, Tanguy, and Patterson	desktop personal computer	1984–91	-18 to -25
	laptop personal computer	1990–98	-40
Chwelos	desktop personal computer	1992–98	-32 to -35
	personal computer	1976–83	-18
Berndt and Rappaport ²	personal computer	1983–89	-18
	personal computer	1989–94	-32
	personal computer	1994–99	-39
Aizcorbe, Corrado, and Doms	desktop personal computer	1994:IV-1998:IV	-31
	notebook personal computer	1994:IV-1998:IV	-26
	personal computer, weighted avg. ³	1994:IV-1998:IV	-30
BEA price index	personal computer	1994:IV-1998:IV	-32

Source: Landefeld, J. Steven and Bruce T. Grimm. 2000. "A Note on the Impact of Hedonics and Computers on Real GDP." *Survey of Current Business*. vol. 80. no. 12. pp. 17-22.

1. See the bibliography of the article for more complete citations.

2. Results reported for "all pooled" regression, (Berndt and Rappaport 2000).

3. Weights are 0.75 for desktops and 0.25 for notebooks.



Lessons Learned: The Need for Robust Results

Price Indexes for Computers: Average Annual Rates of Decline, 1995-99

	<u>Percent</u>
NIPA private fixed investment:	
Computers and peripheral equipment	-24.2
Personal computers	-33.3
Berndt and Rappaport ¹:	
Desktop personal computers, unit prices	-8.7
Mobile personal computers, unit prices	-4.6
Personal computers, mean of alternative hedonic indexes ..	-39.8

Price Indexes for Computers: Average Annual Rates of Decline, 1994:IV to 1998:IV

	<u>Percent</u>	
	<u>Traditional</u>	<u>Hedonic</u>
NIPA Private fixed investment:		
Computers and peripheral equipment	-----	-23.7
Personal computers	-----	-32.5
Aizcorbe et al. ²:		
Desktop personal computers	-30.6	-31.0
Notebook computers	-24.6	-26.3
Weighted average ³	-29.1	-29.8

Source: Landefeld, J. Steven and Bruce T. Grimm. 2000. "A Note on the Impact of Hedonics and Computers on Real GDP." *Survey of Current Business*, vol. 80, no. 12, pp. 17-22.

1. Source: Berndt and Rappaport 2000.

2. Source: Aizcorbe et al. 2000.

3. Weights are 0.75 for desktops, 0.25 for notebooks.



Reaction to Hedonics

- “A True and Fair View of Productivity” *Financial Times*, March 2002
 - “Alan Greenspan has endorsed an overstatement of U.S. economic performance comparable to Enron’s accounting method.”
- “Stupid Tech Tricks” *San Francisco Chronicle*, Nov. 2003
 - “To confuse matters, the Commerce Department calls the adjusted numbers real and the actual dollars spent nominal.”



Lessons Learned: Remaining Challenges

- Need for Integration
- Need for continuing education
- Need to develop data
- Need for new concepts and definitions
- Stakes are high
 - Government output (education, health care, police)
 - Services and nonprofit
 - Sources of productivity and economic growth
 - Saving, investment, external imbalances and wealth



Lessons Learned: Remaining Challenges

- One of the largest needs is Integration
- Lack of integration has presented significant problems for U.S. decentralized statistical system including
 - Charges that U.S. saving rate “flawed”
 - Inconsistencies that have fostered debate over issues ranging from the role of IT in growth to the importance and role of external imbalances
 - Implications for tax policy, monetary policy, and other key issues such as Social Security

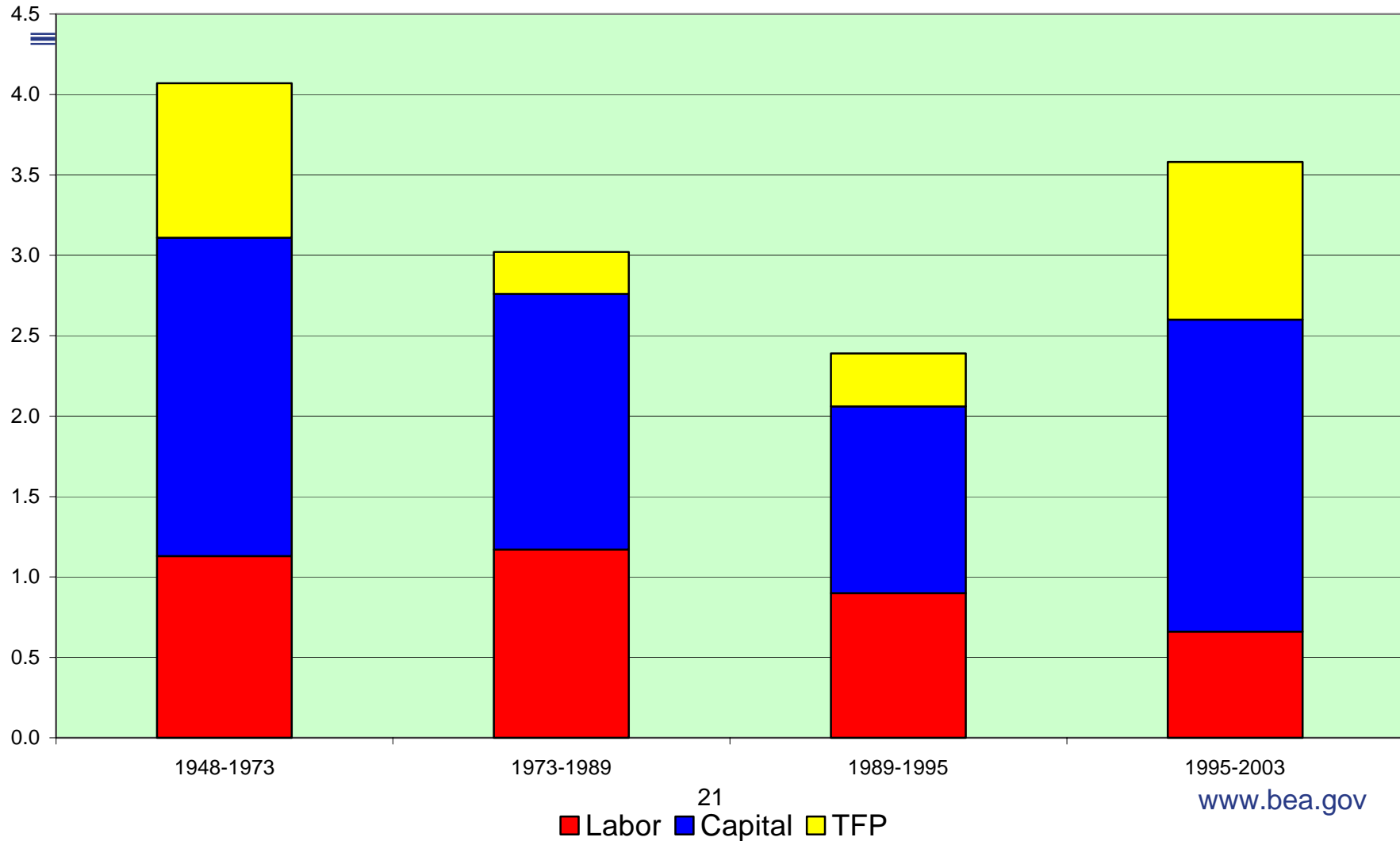


Remaining Challenges: Integration

- A system such as that presented in Jorgenson and Landefeld (2005) allow integrated analysis of the economy through:
 - The addition of an integrated production accounts
 - The addition of an integrated capital and wealth account, and
 - The linking of these accounts to underlying industry, asset, and liability account detail

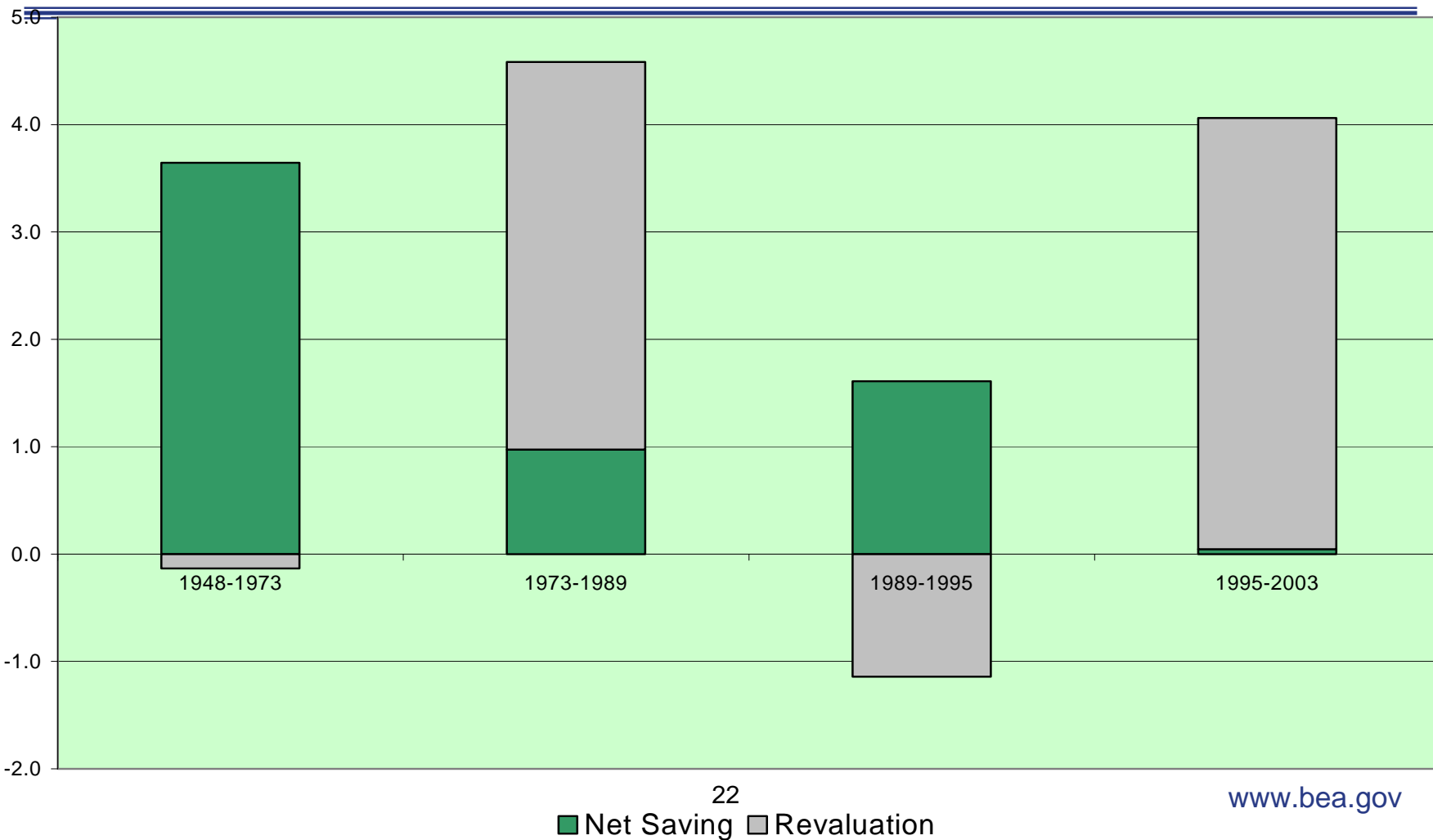


Contributions to Growth





Contributions to Change in Wealth





1. PRODUCTION

Gross Domestic Product Equals

Gross Domestic Factor Outlay

**2. DOMESTIC RECEIPTS
AND EXPENDITURES**

Domestic Receipts Equal

Domestic Expenditure

3. FOREIGN TRANSACTION CURRENT ACCOUNT

Receipts from Rest of World Equal

Payments to Rest of World and

Balance on Current Account

4. DOMESTIC CAPITAL ACCOUNT

Gross Domestic Capital Formation Equals

Gross Domestic Savings

5. FOREIGN TRANSACTION CAPITAL ACCOUNT

Balance on Current Account Equals

Payments to Rest of the World and

Net Lending or Borrowing

6. DOMESTIC BALANCE SHEET

Domestic Wealth Equals

Domestic Tangible Assets and

U.S. Net International Position

7. U.S. INTERNATIONAL POSITION

U.S.-Owned Assets Abroad Equal

Foreign-Owned Assets in U.S. and

U.S. Net International Position



“A nickel isn't worth a dime today.”

--Yogi Berra