

Strengths and Weaknesses of the Consumer Expenditure Survey from a BLS Perspective

Thesia I. Garner
Robert McClelland

Division of Price and Index Number Research

William Passero

Division of Consumer Expenditures

Bureau of Labor Statistics

NBER/CRIW
July 13, 2009

Outline

- Background
- BLS Internal Review of CE
- Data Comparisons
 - ▶ To other data sources
 - ▶ CE to PCE
- Conclusion

About BLS

- BLS is the principal fact-finding agency for the Federal Government in the broad field of labor economics and statistics
- Independent national statistical agency that
 - ▶ Collects,
 - ▶ Processes,
 - ▶ Analyzes, and
 - ▶ Disseminates
 - Essential statistical data to
 - American public
 - U.S. Congress
 - Federal agencies
 - State and local governments
 - Business
 - Labor

(<http://www.psb.bls.gov/whatisbls/strategic/mission.php>)



From the BLS Mission Statement

- **BLS data must be**
 - ▶ **Relevant** to current social and economic issues
 - ▶ **Timely** in reflecting today's rapidly changing economic conditions
 - ▶ **Accurate** and of consistently high statistical quality
 - ▶ **Impartial** in both subject matter and presentation
- *And must...*
 - ▶ Maintain respondent confidentiality
 - ▶ Be reliable

Mission of the Consumer Expenditure Survey (CE)

- Produce and disseminate statistical data on
 - ▶ Consumer expenditures
 - ▶ Demographic information
 - ▶ Related data needed by
 - Consumer Price Index
 - Other public and private data users
- Design and manage the CE survey
- Provide education and assistance in the use of the data
- Conduct analytical studies

Goals and Uses of CE Data

- Goals
 - ▶ Provide biennial data for Consumer Price Index (CPI) to revise expenditure weights
 - ▶ Detailed information about the spending patterns of different types of households
- Used by:
 - ▶ Bureau of Economic Analysis
 - ▶ Internal Revenue Service
 - ▶ Census Bureau
 - ▶ Department of Defense
 - ▶ New York City government
 - ▶ Other private and public researchers
- Potential future use
 - ▶ Alternative poverty thresholds (pending federal legislation)

CE Scope and Coverage

- U.S. civilian non-institutionalized population
 - ▶ Nationwide survey designed to be representative
- Data from consumer units (CUs)
 - ▶ People living at one address who share living expenses or are related by blood, marriage, adoption, or other legal arrangement
 - ▶ Single person living alone or sharing a household with others but who is financially independent
 - ▶ Two or more persons living together who are financially dependent
- CUs are similar to households

CE Data Collection

- BLS contracts with the U.S. Census Bureau to collect data
- Two different surveys
 - ▶ Quarterly Interview
 - ▶ Diary
- Separate samples

Data Collection: Interview

- Designed to obtain information about:
 - ▶ Large purchases (e.g., major appliances)
 - ▶ Purchases that occur regularly (e.g., monthly payments for rent and utilities)
 - ▶ Excludes expenditures for:
 - Housekeeping supplies
 - Personal care products
 - Non-prescription drugs
- Sample
 - ▶ About 7,000 CUs
 - ▶ Five consecutive quarters
 - ▶ Goal: to collect data over a year of spending
- Three-month recall period

Data Collection: Diary

- Designed to collect information about:
 - ▶ Frequent purchases (e.g., food and personal care items)
 - ▶ Difficult to remember over longer periods of time (e.g., vending machine purchases)
 - ▶ Excludes expenditures for out-of-town trips
- Sample
 - ▶ About 7,000 CUs a year
 - ▶ CUs keep a diary for two consecutive one-week periods → 14,000 diaries a year

Users: Data Access

- Tables
- Public use data files
- Visiting researcher program
- Personal help
 - ▶ Phone
 - ▶ Email

Publication Tables: “Integrated”

- Neither survey collects the entire universe of expenditures
 - ▶ Some data are only collected in one instrument
 - ▶ Some data are collected in both; determine best source for use in publications
- Total and detailed expenditures published by income and other demographic variables
- Estimates use CU population weights

BLS Internal Program Review

- Purpose: to maintain high standards of data quality
- Focus: programs responsible for producing data
- Procedure: subject matter experts from other BLS programs examine issues such as
 - ▶ Data collection and quality
 - ▶ Data accessibility
 - ▶ Management processes
- Output: report of strengths, weaknesses and recommendations for further action

CE Program Review: 2006-2008

■ Strengths

- ▶ Data access
 - Public use data
 - Outside researchers coming to BLS
- ▶ Production and planning tools*
 - Database containing all development, research and production project plans
 - Web-based interface managing projects and reporting
 - Innovative methods for tracking multiple production processes
 - In-house training on how to use these tools
- ▶ Free microdata user workshops*
 - Began: 2006
 - Next: July 29-31, 2009
- ▶ Regular interaction with users

**Recommended as BLS Best Practice*

CE Program Review: Strengths (continued)

- Program conducts research on issues affecting data quality
 - ▶ Declining response rates
 - ▶ Under-reporting
 - ▶ Increase in phone interviews versus person-to-person interviews

CE Program Review: Weaknesses

- Biases in estimates, due to:
 - ▶ Consumer unit non-participation
 - ▶ Item non-response
 - ▶ Measurement error
 - ▶ Conditioned under-reporting
 - “training” respondents to say “no”
- Timeliness of data release
- Jay will present more from the CE Program Review and plans to deal with weaknesses

Data comparisons: Why needed?

- Such comparisons provide:
 - ▶ A sense of degree and direction of possible survey errors, rather than an exact measure of bias
 - ▶ Specific estimates from other sources are not necessarily the “truth”
- Data comparisons are employed to:
 - ▶ Assess the cumulative effects of non-sampling errors on quality of CE data
 - ▶ Develop methodological studies to improve quality

Comparisons: Issues

- Account for differences in content or concept
(focus on components)
 - ▶ can be reconciled
 - ▶ cannot be reconciled
- Source of data
 - ▶ Household survey
 - ▶ Census
 - ▶ Administrative
 - ▶ Trade association publications

Comparisons: Other Data Sources

- Panel Study of Income Dynamics (PSID)
- Health and Retirement Survey Consumption and Activities Mail Survey (HRS-CAMS)
- Medical Expenditure Panel Survey (MEPS)
- National Health Expenditure Accounts (NHEA)
- Economic Research Service (ERS-USDA) Food Data
- ACNielsen Homescan Survey
- Income and transfer comparisons
 - ▶ PSID, SIPP, CPS
- Personal Consumption Expenditures (PCE)

Survey Covering All Expenditure Categories: PSID

- Panel Study of Income Dynamics (PSID)
 - ▶ 1999, 2001, 2003
 - ▶ Sample: all households and their members in panel
 - ▶ Collection of data by phone
 - ▶ Recent study: Charles et al. (2007)
 - For comparable categories in 2003, PSID total spending 1% higher than CE total spending
 - CE spending higher than PSID
 - Housing (3%), Transportation (7%)
 - PSID spending higher than CE
 - Education (13%), Child care (26%), Health care (14%), Food (10 %)

Survey Covering All Expenditure Categories: HRS-CAMS

- Health and Retirement Survey Consumption and Activities Mail Survey (HRS-CAMS)
 - ▶ Waves: 2001, 2003, 2005
 - ▶ Sample: respondents aged 51 and older and members of their household
 - ▶ Collection of data by mail
 - ▶ Hurd and Rohwedder (2008)
 - For comparable categories (October 2000-September 2001), average spending was
 - 55-64 age group: 3.3% higher than CAMs
 - 65-74 age group: 12.0% higher than CE
 - 75 and over age group: 29.8% higher than CE

Comparisons: Health Care

- Medical Expenditure Panel Survey (MEPS)
 - ▶ 1996-2006
 - ▶ Sample: same as CE
 - ▶ Results
 - Ratio of CE to MEPS total health care spending ranges from 0.68 to 0.93
- National Health Expenditure Accounts (NHEA)
 - ▶ 1996-2006
 - ▶ Sample: all persons who are residents in U.S. including military
 - ▶ Results
 - Ratios of CE to NHEA total health care spending range from 0.72 to 0.86
- Foster, forthcoming *MLR* 2009

Comparisons: Food

- Economic Research Service (ERS-USDA) Food Data
 - ▶ Food expenditures by families and individuals
 - ▶ ERS excludes food purchases with food stamps and WIC vouchers
- Internal BLS comparison with CE
 - ▶ CE excludes food purchases with food stamps
 - ▶ 2002 to 2007
 - ▶ CE to ERS aggregate expenditures average about 0.79

CE and PCE Comparisons

- Definitions of populations and expenditures
 - Data sources and periodicity
 - Trends over time in levels and ratios
 - Example for total expenditures with adjustments for select differences
- Garner, Janini, Passero, Paszkiewicz, and Vendemia, *Monthly Labor Review*, September 2006

Issues in Comparing CE and PCE

- Populations
- In PCE but out of scope for CE
- In CE but out of scope for PCE
- Partly out of scope for CE
 - ▶ Non-profit institutions serving households
 - ▶ Employer payments
- Components operationally defined differently

Basics

■ CE

- ▶ Household Surveys
- ▶ Periodicity
 - Annual
 - Quarterly
 - Monthly
 - Weekly
- ▶ Expenditures
 - Value of goods and services purchased by consumers
 - Social Security contributions

■ PCE

- ▶ Establishment Surveys
- ▶ Periodicity
 - Benchmark (detailed)
 - Annual
 - Quarterly
 - Monthly
- ▶ Expenditures
 - Value of goods and services purchased by the personal sector (excludes intra-sector transactions)

In PCE Out of Scope for CE

- Population
 - ▶ Employees of U.S. businesses working abroad and U.S. government and military personnel stationed abroad
 - ▶ Military living on-base in the U.S.
 - ▶ All persons in institutions and the homeless for whom expenditures are made
 - ▶ Non-profit institutions serving households
- Expenditures
 - ▶ Value of home production for own consumption on farms
 - ▶ Standard clothing issued to military
 - ▶ Services furnished without payment by financial intermediaries except life insurance carriers

Further Differences

- PCE items partly out of scope for CE and partly defined differently
 - ▶ Health Care Expenditures
 - ▶ Religious and Welfare

- Defined differently
 - ▶ Education expenditures
 - ▶ Life insurance and pension plans
 - ▶ Owner-occupied housing expenditures

Previous CE to PCE Comparison Studies

- Houthakker and Taylor (1970)
- Slesnick (1992, 1998)
- Attanasio, Battistin, and Leicester (2006)
- Garner, Janini, Passero, Paszkiewicz, and Vendemia (2006)
- Meyer and Sullivan (2009)

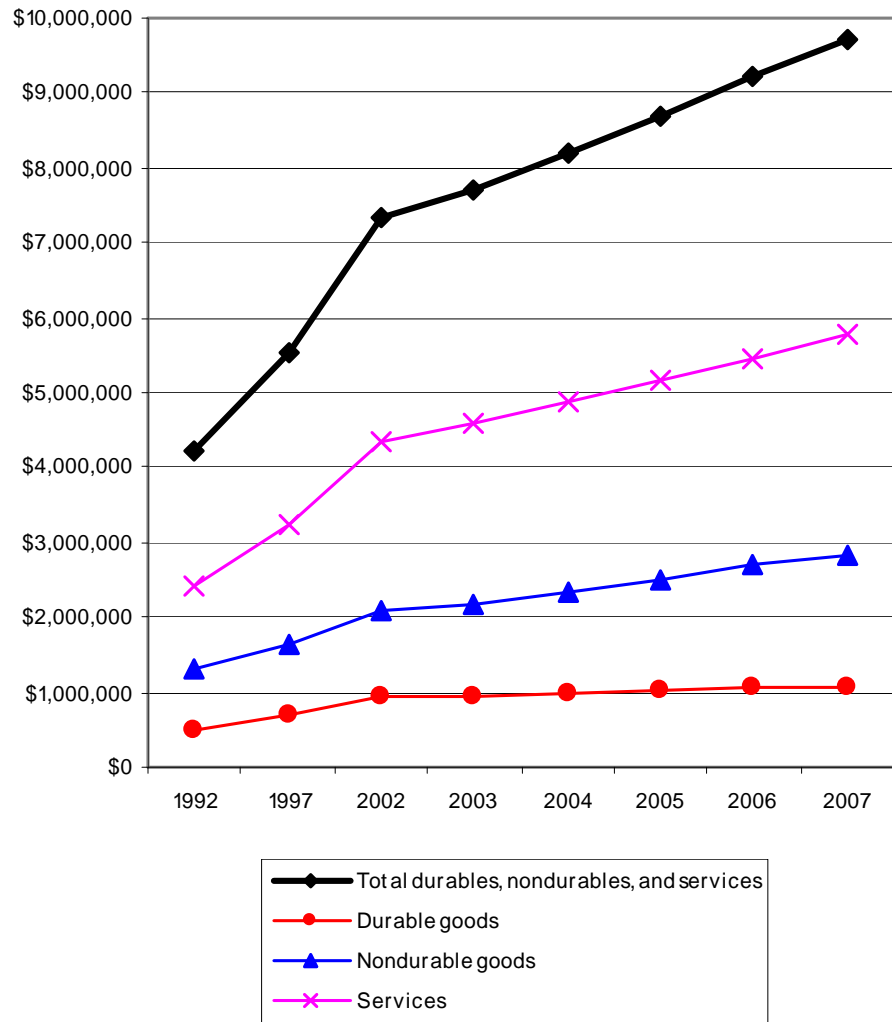
Update of 2006 BLS Study

- Total Expenditures
- Comparables
 - ▶ To compare CE and PCE data, CE items are grouped into PCE detailed categories
 - ▶ In many instances, there is no perfect match between the CE and PCE items assigned to an aggregate category
 - ▶ In some cases, adjustments were made to published CE categories for greater comparability

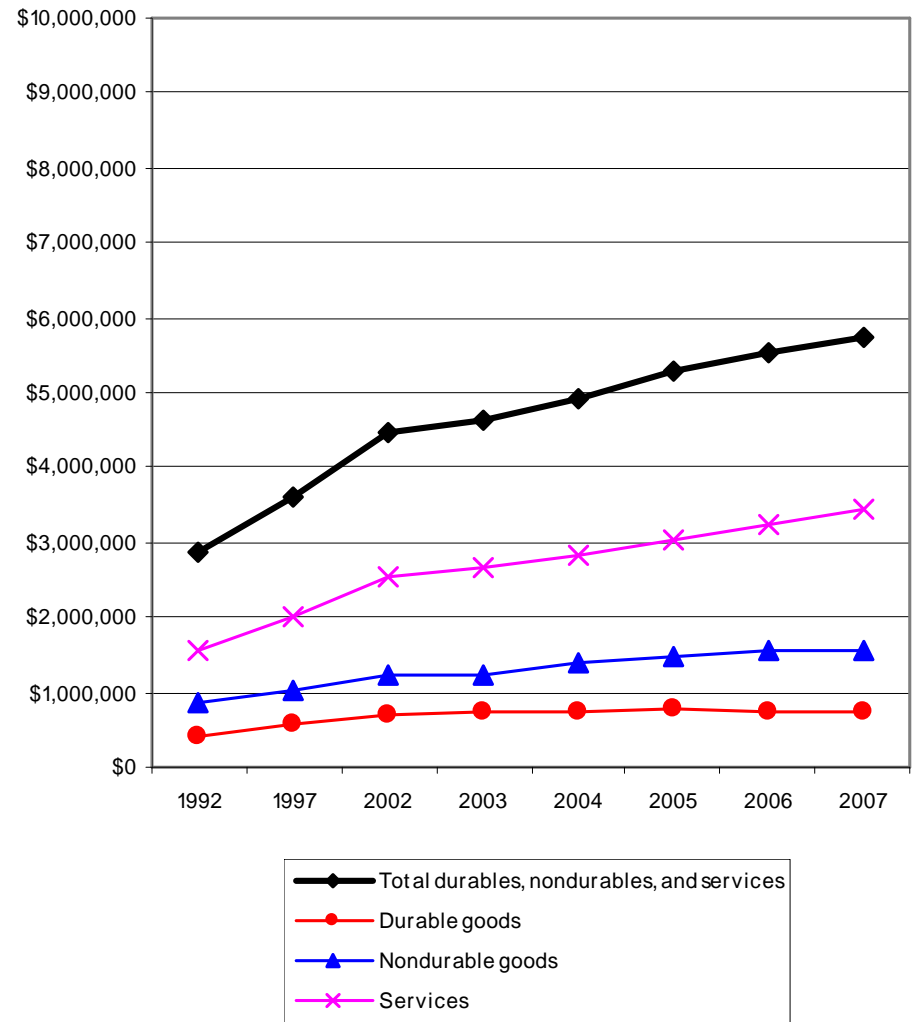
2007 Aggregate and Ratio Comparison

Source	All items (\$billions)	“Comparable” categories (\$billions/% of all items)
Consumer Expenditures	\$5,743	\$4,105 (0.71)
Personal Consumption Expenditures	\$9,710	\$5,066 (0.52)
<i>Ratio CE/PCE</i>	<i>0.59</i>	<i>0.81</i>

PCE Aggregates: All

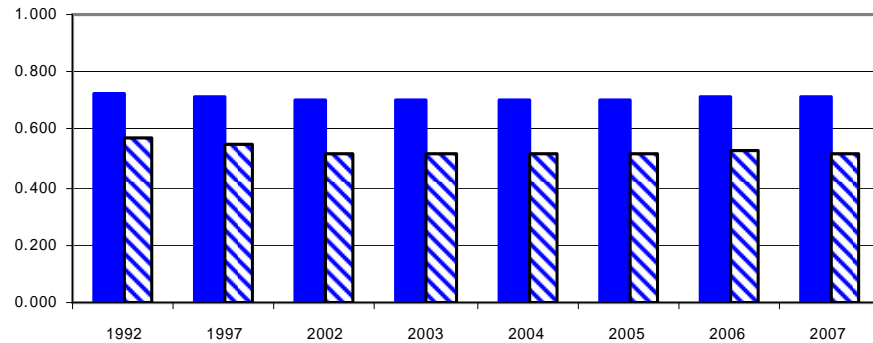


CE Aggregates: All

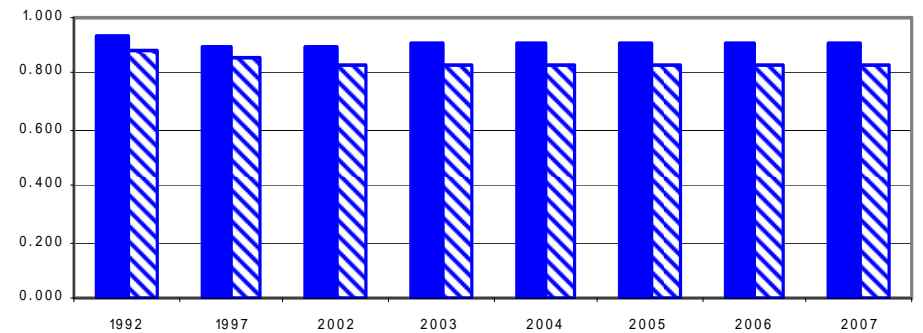


Ratios of Expenditures of Comparables to Totals

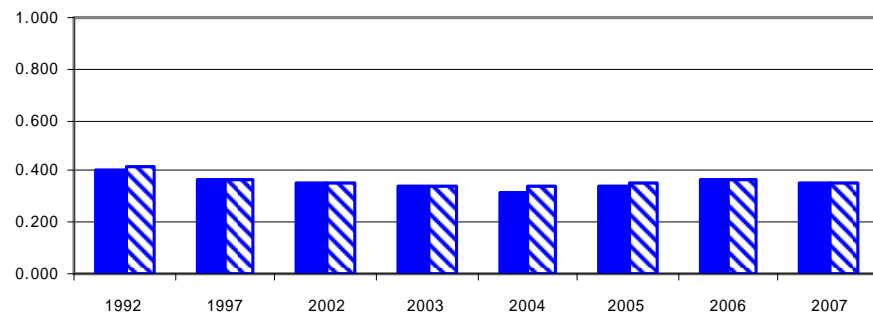
Durables, Nondurables, and Services



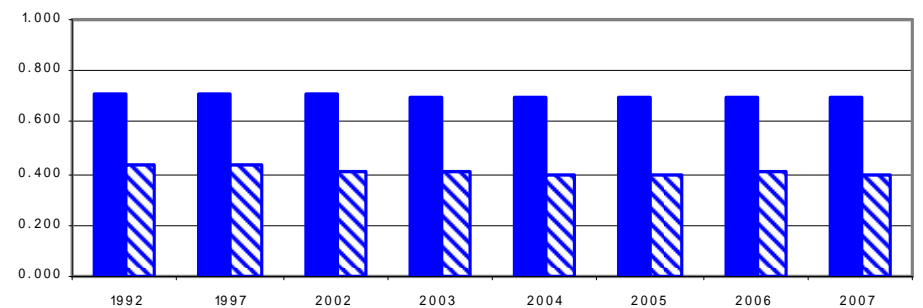
Non-durable Goods



Durable Goods



Services

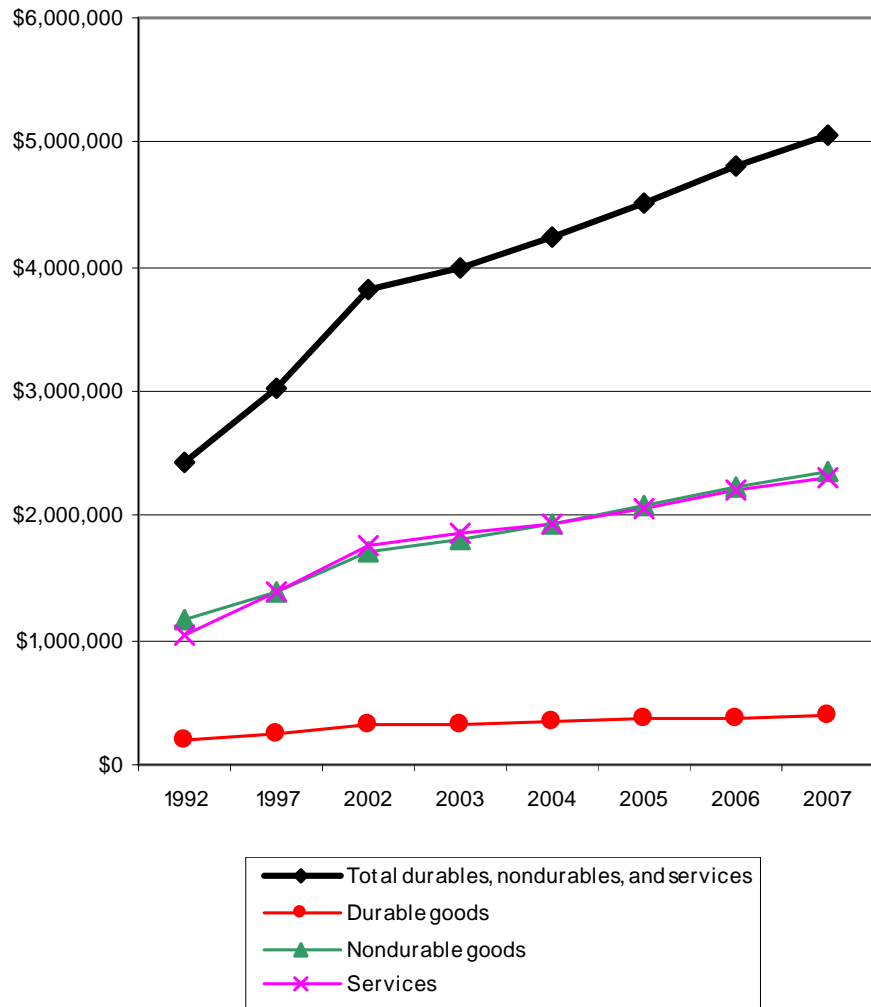


CE: Solid blue

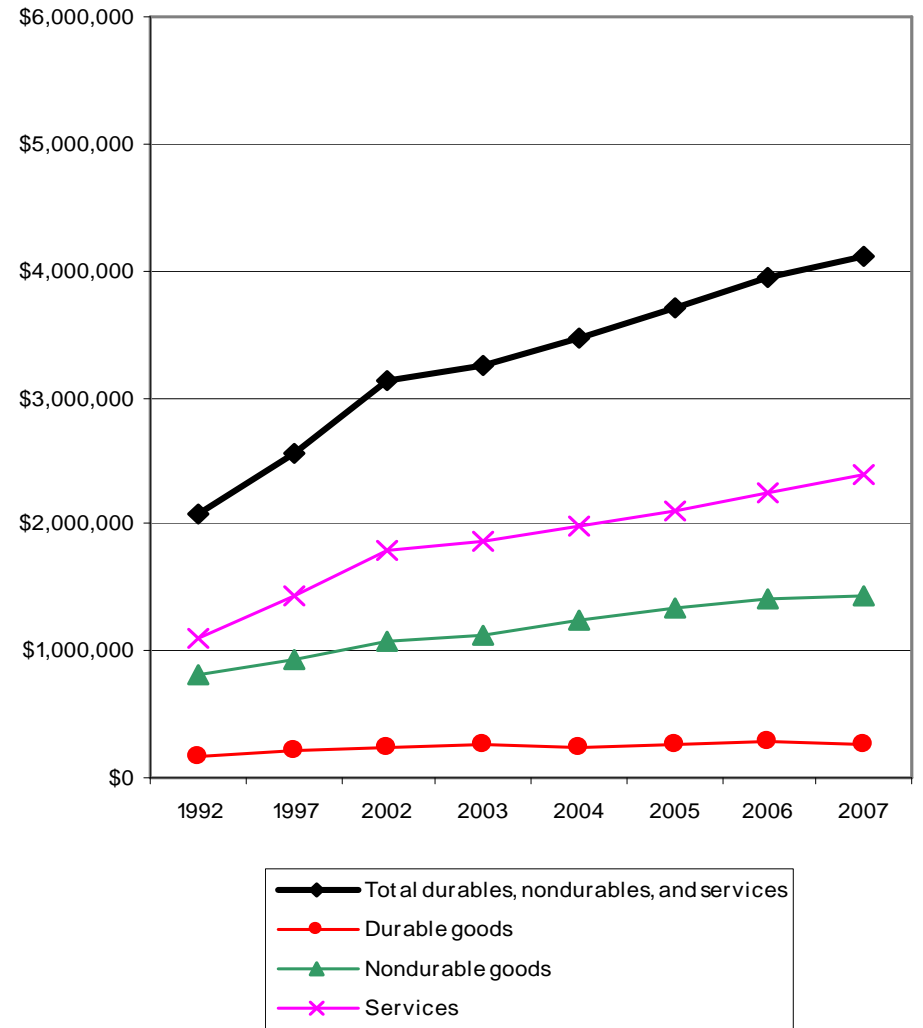
PCE: Stripped blue



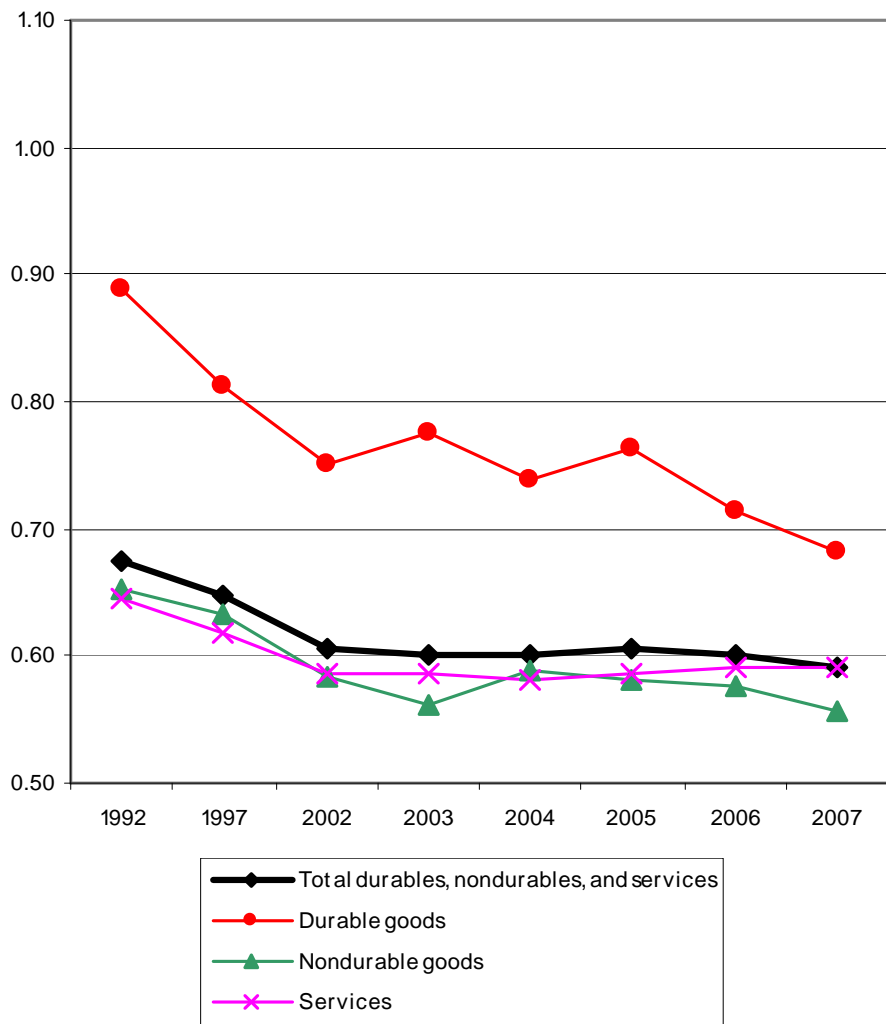
PCE Aggregates: Comparables



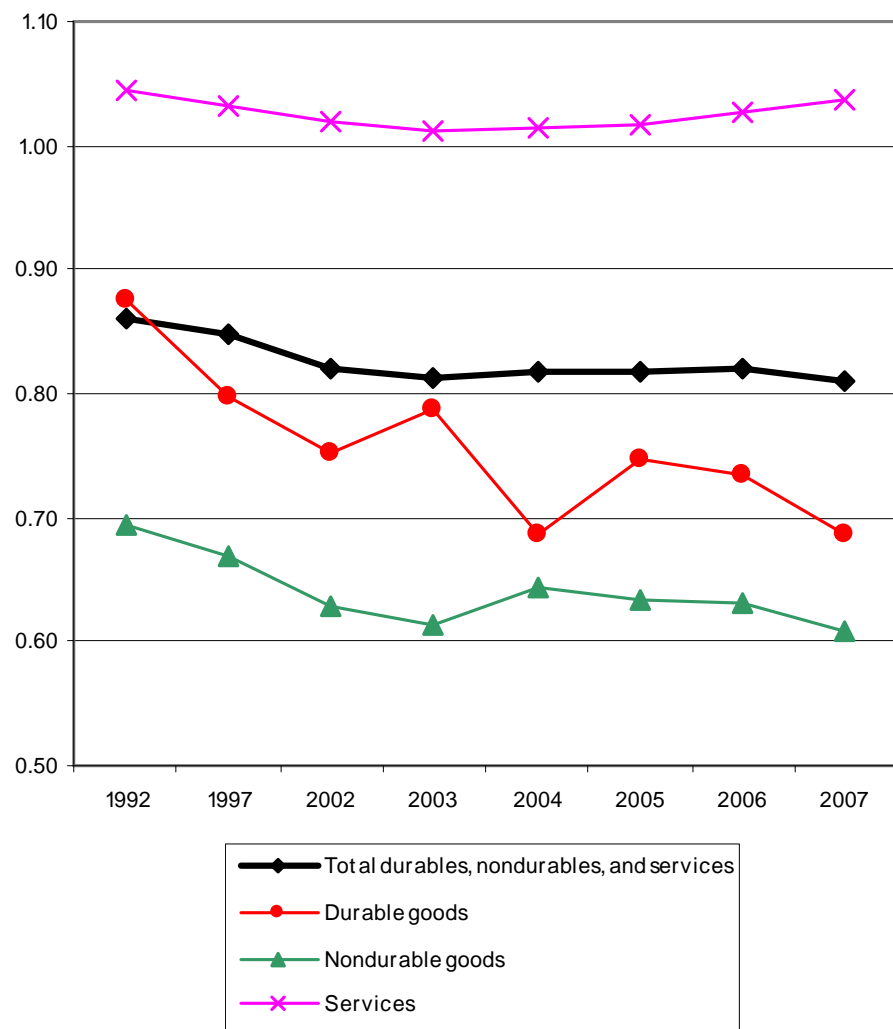
CE Aggregates: Comparables



CE/PCE Ratios: All



CE/PCE Ratios: Comparables



Future CE/PCE Comparisons

- Comprehensive revision of the NIPA
 - ▶ July 2009
 - ▶ PCE
- Revise concordance of CE items to match new PCE classification structure
- Recalculate CE/PCE ratios incorporating 2002 benchmark PCE data

PCE reclassification: What's new?

- New structures for presenting PCE
 - ▶ Function – by type of expenditure
 - ▶ Product – by durability (Goods / Services)
- Full time series on new basis
 - ▶ 1929 Annually, 1947 Quarterly, 1959 Monthly
- No change in the production boundary
- McCully and Teensma, *Survey of Current Business*, May 2008

PCE by function: Old to new

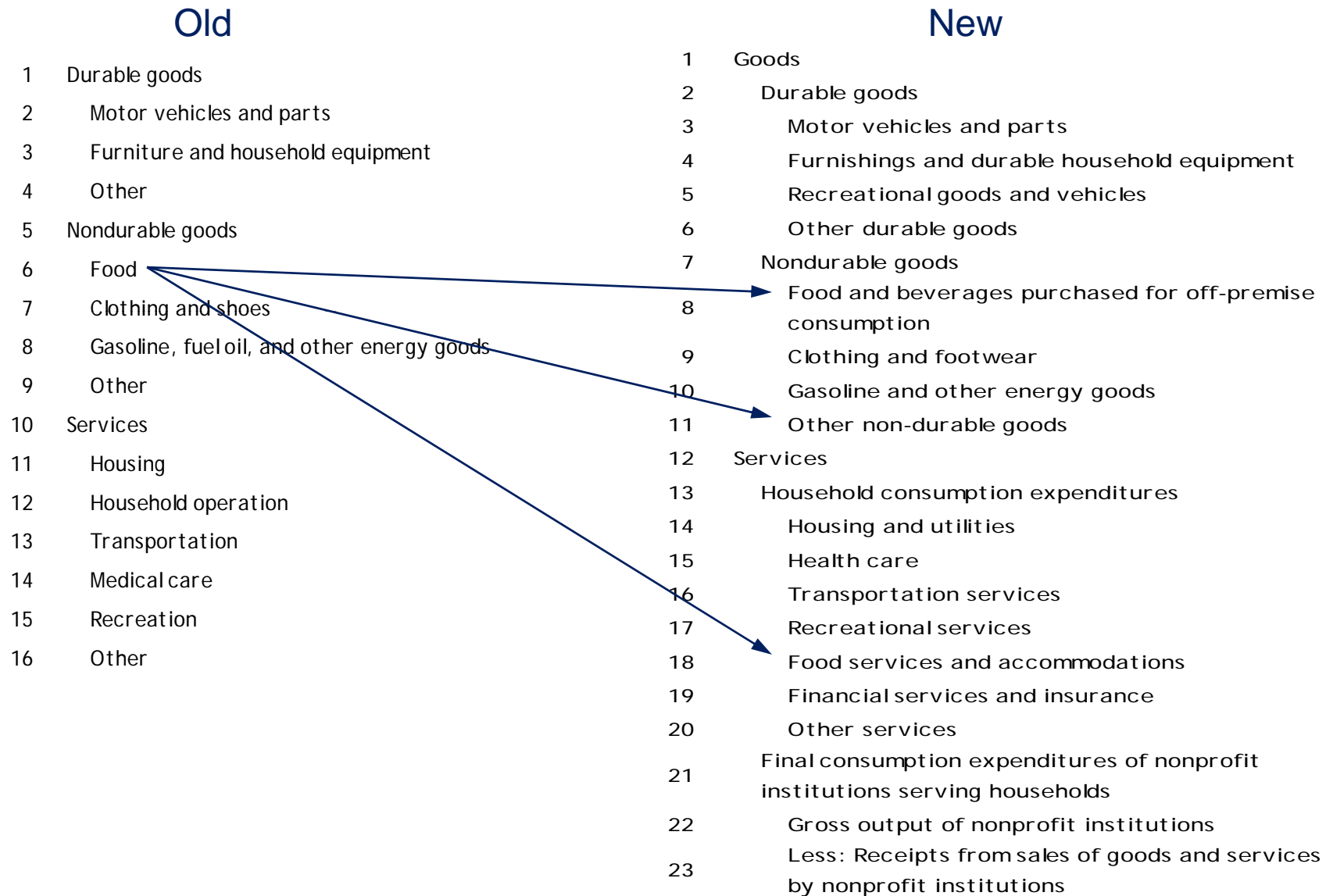
Old

- 1 Personal consumption expenditures
- 2 Food and tobacco
- 3 Clothing, accessories, and jewelry
- 4 Personal care
- 5 Housing
- 6 Household operation
- 7 Medical care
- 8 Personal business
- 9 Transportation
- 10 Recreation
- 11 Education and research
- 12 Religious and welfare activities
- 13 Foreign travel and other, net

New

- 1 Personal consumption expenditures
- 2 Household consumption expenditures
- 3 Food and beverages purchased for off-premise consumption
- 4 Clothing and footwear
- 5 Housing and utilities
- 6 Furnishings, household equipment and routine household maintenance
- 7 Health
- 8 Transportation
- 9 Communication
- 10 Recreation
- 11 Education
- 12 Food services and accommodations
- 13 Financial services and insurance
- 14 Other goods and services
- 15 Net foreign travel and expenditures abroad by U.S. residents
- 16 Final consumption expenditures of NPISH

PCE by product: Old to new



Conclusion

- CE expenditures compare favorably to expenditures from other household surveys
- CE data comparisons with outside sources will continue in the future
 - ▶ CE-PCE
 - ▶ CE-MEPS comparisons of medical care data
 - ▶ CE-CPS comparisons of income data
 - ▶ Resumption of comparisons of CE and Residential Energy Consumption Survey (RECS) data from Department of Energy
 - ▶ CE-American Community Survey (ACS) comparison of shelter and utilities data

Conclusion

- Recent improvements include
 - ▶ Move to CAPI (2003 for Interview; 2004 for Diary)
 - ▶ Income imputation (began 2004)
 - CE/CPS total income
 - 2002-2003: 0.75
 - 2004-2006: 0.94
 - CE/CPS wages and salaries
 - 2002-2003: 0.78
 - 2004-2006: 0.97
 - ▶ Stabilized CE/PCE ratio $>.81$ for comparable items beginning in 2002

Conclusion: Data Quality

- CE Program has significant strengths, but some data quality issues remain, e.g.,
 - ▶ Under-reporting
 - ▶ Measurement errors
- Next presentation: What CE has done and is doing to address these issues

Contact Information

Thesia I. Garner

Senior Research Economist

Division of Price and Index Number Research
Bureau of Labor Statistics

202-691-6576

garner.thesia@bls.gov