

# **The Consumer Expenditure Survey in Comparison: Focus on Personal Consumption Expenditures of the National Income and Product Accounts**

---

**American Council on Consumer Interests**

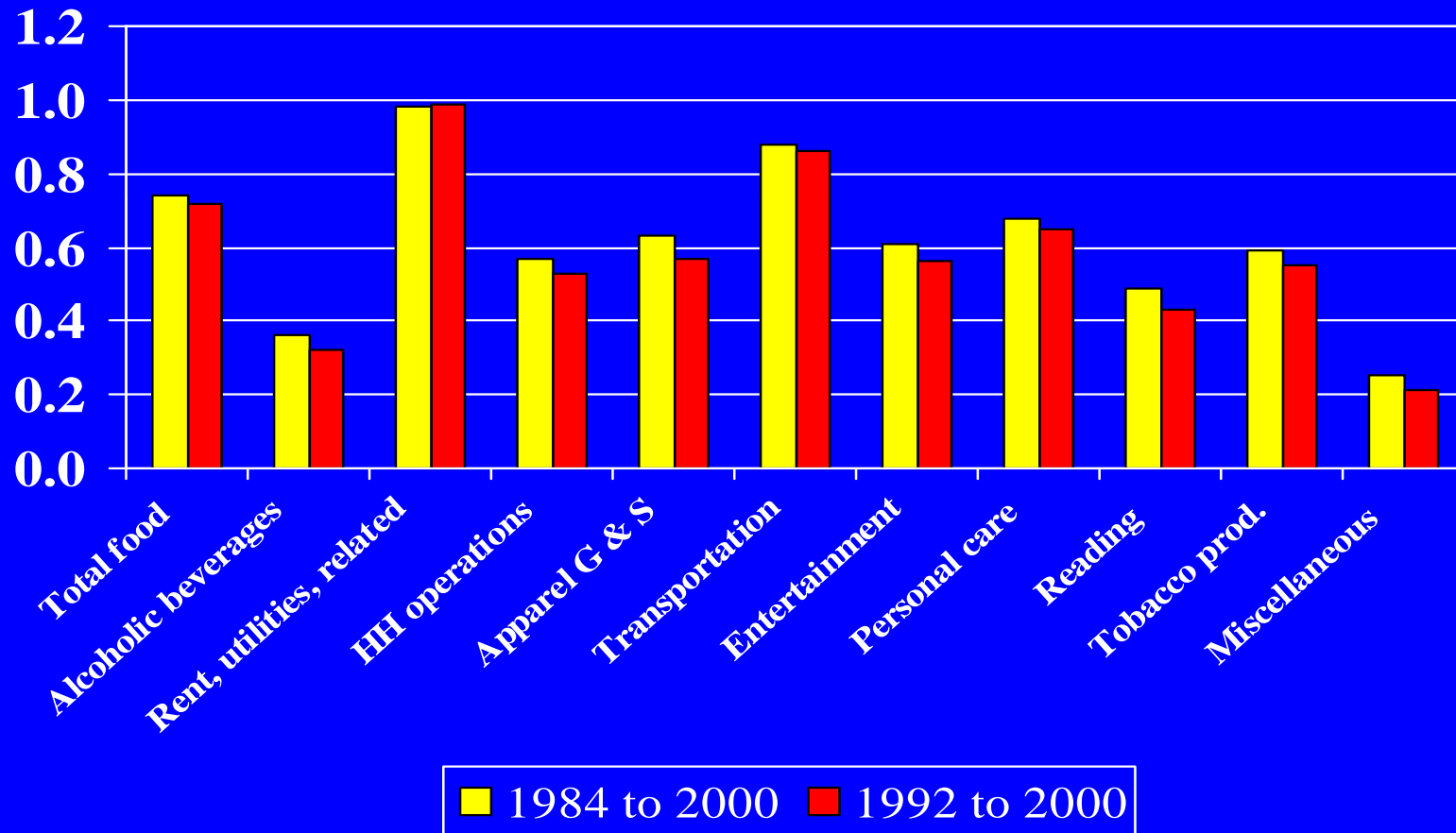
**49<sup>th</sup> Annual Conference**

**Atlanta, GA**

**April 5, 2003**



# CE to PCE Ratios: Averages Over Time (*1992 benchmark PCE*)



# Data Comparisons Team

---

## ◆ *Initial (micro) plan*

- choose expenditure category based on magnitude of difference between CE and PCE estimates where no *a priori* reasons for difference was apparent
- examine derivation of estimates
- evaluate the estimates
- recommend further action

## ◆ *Revised (macro/micro) plan*

- macro analysis of issues that affected many expenditure categories, evaluating impact of issues on CE and PCE estimates
- micro plan as above focusing on category-specific issues

# Populations

---

## ◆ CE: *consumer units*

- Civilian non-institutional population and some institutional
- Continental U.S., Alaska, and Hawaii

Numbers of persons 2.1% less than represented by PCE

## ◆ PCE: *persons resident*

- Individuals
  - » Persons resident in U.S. and those physically located in U.S. and have resided, or expect to reside in U.S. for 1 year or more
  - » Employees of U.S. businesses abroad for 1 year or less
  - » U.S. government civilian and military personnel stationed abroad regardless of time
- Nonprofit institutions serving individuals

# Data Sources

---

- ◆ CE: direct
  - Household Surveys
    - » Interview
    - » Diary
  - Sampling and non-sampling errors
  - Imputation/allocation
- ◆ PCE: indirect (commodity flow; mostly residual)
  - Sources
    - » Government statistical reports
    - » Government administrative and regulatory agency reports
    - » Reports from private organizations
    - » CE (motor vehicle leasing and rental, taxis, nursery schools, child care)
  - Interpolation/extrapolation
  - Revisions

# Definition of Expenditures

---

- ◆ CE - What consumers spend: transaction costs including excise and sales taxes of goods and services acquired during reference period
  - Primarily out-of-pocket expenditures (OOP) reported by consumers plus value of in-kind food and rent as pay, and food stamps
- ◆ PCE - Value of goods and services purchased by the personal sector including excise and sales taxes
  - Spent by individuals
  - Operating expenses of nonprofit institutions serving individuals
  - Value of food, fuel, clothing, rent of dwellings, and financial services received in kind by individuals; and net purchases of used goods

# Differences in Scope of Expenditures

---

- ◆ In scope for CE, out of scope for PCE
  - Transactions between households (such as used vehicles, apparel)
- ◆ In scope for PCE, out of scope for CE
  - 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
  - Rental value of owner occupied dwellings and owned appliances

# Partly Out Of Scope For CE and Partly Defined Quite Differently

---

## ◆ Health Care Expenditures

- CE medical care OOP; PCE medical care expenditures made by households, insurance companies, employers, and non-profits (=current expenditures of non-profits+payments by patients to profit and government facilities)

## ◆ Religious and Welfare

- CE cash contributions; PCE religious and welfare not including child care (for nonprofits=current expenditures net of receipts for commodities; for profit and gov't=receipts from users)



# Defined Quite Differently

---

## ◆ Education Expenditures

- CE education OOP
- PCE education and research expenditures made by households and for profit and non-profit institutions serving households (for private=current expenditures net of receipts for meals, etc. and for gov't=student tuition payments; fees paid to other schools plus current expenditures)

## ◆ Life Insurance and Pension Plans

- CE premiums paid and consumer contributions OOP
- PCE expense of handling: operating and administrative expenses, premiums paid net of benefits and dividends, profits of some companies

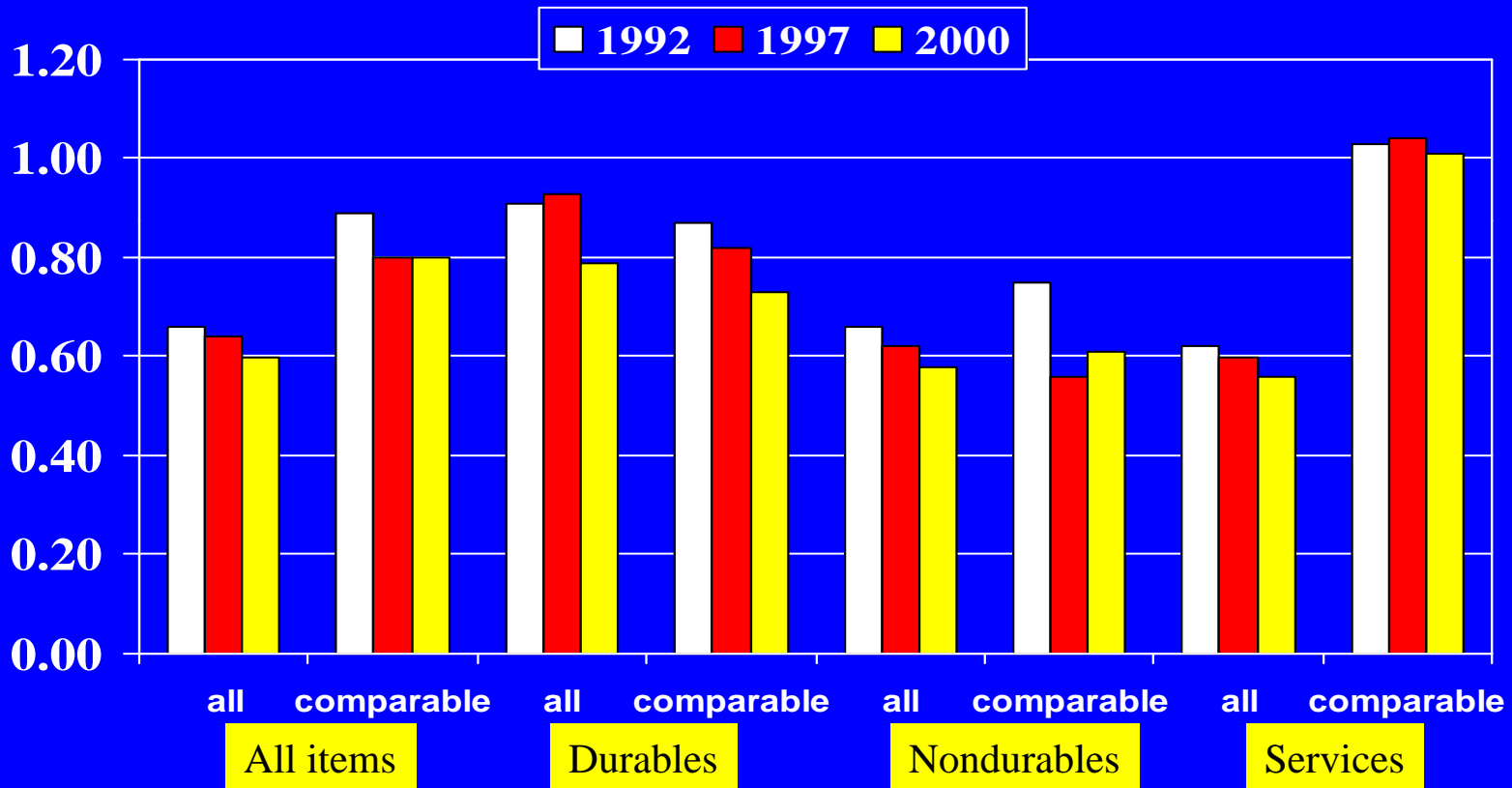
## ◆ Owner-Occupied Housing Expenditures

- CE expenditures for owner occupied housing (interest and charges, property taxes, maintenance and repairs, and other expenses)
- PCE imputed space rent

## CE to PCE Aggregate Expenditures (billions of dollars)

	1992 (billions)	1997 (billions)	2000 (billions)
Total CE	\$2,788	\$3,553	\$4,020
Total PCE	\$4,210	\$5,529	\$6,728
<b>% Total</b>	<b>66%</b>	<b>64%</b>	<b>60%</b>
Total CE Comparable	\$2,107	\$2,490	\$2,982
Total PCE Comparable	\$2,369	\$3,117	\$3,723
<b>% Comparable</b>	<b>89%</b>	<b>80%</b>	<b>80%</b>
<i>CE Comparable as % of CE Total</i>	76%	70%	74%
<i>PCE Comparable as % of PCE Total</i>	56%	56%	55%

# CE Integrated/PCE Ratios: Comparables



# Analytical Example

---

1992 Expenditures for Apparel  
in the CE and PCE

# Expenditures for apparel, total and by major item category, 1992 CE and PCE

<b>Item category</b>	<b>Annual expenditures (millions of dollars)</b>	
CE Total	\$143,970	
Men's & boys' apparel		\$45,018
Women's & girls' apparel		68,056
Apparel for children under 2		7,772
Footwear		23,124
PCE Total	\$212,259	
Clothing for males		\$63,645
Clothing for females		107,474
Clothing for infants		8,237
Shoes		32,903

# Derivation of CE Estimates

---

- ◆ Diary survey is the source for about 63 percent of aggregate apparel expenditures, while the Interview survey accounts for the remaining 37 percent
- ◆ Individual expenditure reports originate in three ways.
  - Directly reported by respondent
  - Allocation of expenditures where respondent reports expenditure for a combination of items
  - Imputation of expenditures where respondent acknowledges purchase, but does not provide value

# Derivation of PCE Estimates

---

- ◆ Process uses data created for preparation of input-output accounts for U. S.
- ◆ The benchmark purchasers' value of goods and services is calculated to determine allocable output.
- ◆ Total purchasers' value is allocated among intermediate and end users.

## Amount of value added to total apparel estimate by factor, 1992 PCE

---

<b>Factor</b>	<b>Value added</b> <i>(millions of dollars)</i>	
Total	\$238,843	
Basic value		\$119,114
Transportation costs		3,369
Wholesale margin		21,286
Wholesale taxes		163
Retail margin		84,860
Retail taxes		10,051



# Allocation of apparel, 1992 I/O Accounts

*(millions of dollars)*

<b>Allocation of Production</b>	Basic value	Whole. margin	Trans. cost	Comm & whole. taxes	Retail margin	Retail taxes	Purchasers' value
Exports	5,422	1,257	356	2			7,037
Intermediate production	4,934	3,609	1,937	27			10,507
Government purchases & sales – Federal	625	111	17	1			754
Government purchases & sales – State & local	1,607	295	53	4			1,959
Change in intermediate goods inventories	44	11	9	1			65
Unspecified costs	1,768	253	27	2			2,050
Change in wholesale inventories	841	148	28	3			1,020
Change in retail inventories	3,260	460	36	4			3,760
Gross private fixed investment	-337	151	54	6			-126
Unallocated output	290	35	18	2			345

# Production and allocation of apparel, 1992 I/O

## Accounts – cont. (millions of dollars)

<b>Allocation of Production</b>	Basic value	Whole. margin	Trans. cost	Comm & whole. taxes	Retail margin	Retail taxes	Purchasers' value
PCE Clocks, Lamps & Artwork	45	0	0	0	1	0	46
PCE Sporting Equipment	3	1	0	0	2	0	6
PCE Vehicle Accessories & Parts	-65	-54	-29	0	0	0	-148
PCE Jewelry & Watches	-765	0	0	0	0	0	-765
PCE Lighting Supplies	47	17	6	1	43	6	120
PCE Other Personal Hygiene Products	43	15	5	1	30	3	97
PCE Food in Off-Premise Food Purchases	-721	0	0	0	0	0	-721
PCE Magazines	-295	0	0	0	0	0	-295
PCE Laundry & Garment Repair	562	0	0	9	0	0	571
PCE Semi-durable Housefurnishings	22	7	2	0	15	2	48
PCE Military Clothing	205	25	0	0	0	0	230
PCE Sewing Goods for Men	10	4	1	0	9	1	25
<b><i>PCE Apparel</i></b>	<b>101,570</b>	<b>14,941</b>	<b>849</b>	<b>100</b>	<b>84,760</b>	<b>10,039</b>	<b>212,259</b>
	<b>119,115</b>	<b>21,286</b>	<b>3,369</b>	<b>163</b>	<b>84,860</b>	<b>10,051</b>	<b>238,844</b>

# Evaluation of CE and PCE Estimates

---

- ◆ Standard errors and confidence intervals
- ◆ Expert judgment
- ◆ Content difference in component categories

# Standard error and 95% confidence interval for total apparel expenditures, 1992 CE

---

<b>Item</b>	<b>Value</b> <i>(millions of dollars)</i>
<b>Total apparel</b>	<b>\$143,970</b>
<b>Standard error</b>	<b>\$4,598</b>
<b>95% confidence intervals</b>	
<b>Upper limit</b>	<b>\$152,982</b>
<b>Lower limit</b>	<b>\$134,958</b>

# Expert Judgment

---

- ◆ Data adjustment in CE
  - Allocation procedures
  - Imputation procedures
  
- ◆ Trade margin calculation in PCE
  - Wholesale
  - Retail

# Impact of data adjustment procedures on apparel estimates, 1992 CE *(millions of dollars)*

---

Item	Total expenditure	Allocated expenditure	% Allocated	Imputed expenditure*	% Imputed*
Total apparel	\$143,970	\$21,022	14.6%	\$172	0.1%
Men's & boys'	45,018	7,901	17.6%	53	0.2%
Women's & girls'	68,056	9,412	13.8%	105	0.2%
Children under 2	7,772	1,092	14.1%	15	0.2%
Footwear	23,124	2,617	11.3%	0	0.0%

\* Imputed expenditures include both strictly imputed and imputed and allocated expenditures

# Calculation of Wholesale Trade Margin in PCE Estimates

---

- ◆ Initial margin estimate is computed for wholesalers whose primary business is apparel from cost of goods sold, sale receipts, and inventory adjustments.
- ◆ Margin estimate for wholesalers whose primary business is apparel needs to be adjusted.
- ◆ CWT data do not distinguish between apparel and non-apparel operations.
- ◆ A harmonization procedure is used based on sales receipt data which is available for all businesses engaged in apparel trade.

# Calculation of Wholesale Trade Margin in PCE Estimates – cont.

---

- ◆ *Ideally*, the trade margin generated by applying the rates of commodity lines handled by apparel wholesalers – the trade margin derived by evaluating purchases, costs, and inventory adjustments.
- ◆ *In practice*, the trade margins are not equal, so adjustments are made to the margin rates for commodity lines and kinds of businesses until the margins are harmonized.



# Calculation of Wholesale Trade Margin in PCE Estimates – cont.

---

- ◆ Effect of this harmonization procedure
  - Margin based on purchases, costs and inventory adjustments is \$17,341 million
  - Harmonized margin calculated by harmonization procedure is \$21,286 million
  - Procedure results in 22.7% increase in apparel margin.

# Examples of content differences in component categories of apparel

---

- ◆ PCE includes athletic footwear for participant sports in apparel. CE includes such footwear in recreation expenditures. (Currently we cannot isolate these expenditures in either PCE or CE to make an adjustment to the aggregates.)
- ◆ PCE includes umbrellas in apparel. CE can assign umbrellas to apparel if reported as clothing accessory, to outdoor equipment if reported as patio umbrella, or to general sports equipment if reported as golf umbrella.

# Summary of Evaluation

---

- ◆ Differential between 1992 CE and PCE estimates - \$68 billion
  - If true CE estimate at upper end of confidence interval - \$9 billion
  - If true PCE wholesale and retail trade margins were based on the lower of pre- and post-harmonized estimates - \$2.8 billion
  - Though we have no estimates of effects, it is unlikely that BLS allocation/imputation procedures or differences in the content of component categories has appreciable impact on expenditure differential
- ◆ Remaining differential - approx. \$56 billion
- ◆ Change in ratio of CE-PCE apparel estimates - 68% → 73%

# Future Work

---

- ◆ Update apparel analysis for 1997 using newly benchmarked PCE data
- ◆ Conduct analysis similar to apparel for entertainment expenditures
- ◆ Review and revise concordance of CE and PCE items for published comparison tables

## Future Work – cont.

---

- ◆ Examine other factors that potentially shed light on differences between CE and PCE estimates
  - proxy response (BRPD)
  - quantity information (apparel)
  - usage of records by respondents
  - assessment of instrument (Diary)
  - response rates