

# Challenges in Measuring the Transformation Of Retail Trade:

Overview of National Academies' Committee on National Statistics  
Recently Released Report, A Satellite Account to Measure the Retail  
Trade Transformation (<https://www.nap.edu/read/26101>)

# Overview of Talk

- Importance of Retail Trade:
- CNSTAT study charge and study process
- Transformation of the retail sector
- Key conceptual and data issues
  - Outputs
  - Identifying retail-related
  - Inputs
- Recommendations

# Importance of Retail Trade

- Economic Policy:
  - Pandemic Response:
    - Fiscal and Monetary Policy
      - Counter cyclical and Income Support
  - Retail Trade and Small Business
- Public perceptions
  - State of the Economy; Final Sales, Inflation, 2/3 of GDP
  - Trust in accuracy of official statistics (up-to-date?)
    - Explosion of innovation in ecommerce reflected in the data?

# E-Commerce Sales

**Table 1. Estimated Quarterly U.S. Retail Sales: Total and E-commerce<sup>1</sup>**

(Estimates are based on data from the Monthly Retail Trade Survey and administrative records. Unless otherwise specified, all estimates are revised based on the 2019 Annual Retail Trade Survey and the results of the 2017 Economic Census.)

Quarter	Retail Sales (millions of dollars)		E-commerce as a Percent of Total	Percent Change From Prior Quarter		Percent Change From Same Quarter A Year Ago	
	Total	E-commerce		Total	E-commerce	Total	E-commerce
<b>Adjusted<sup>2</sup></b>							
1st quarter 2021(p)	1,581,424	215,035	13.6	7.8	7.7	16.8	39.1
4th quarter 2020	1,467,425	199,665	13.6	0.6	-0.9	7.0	32.0
3rd quarter 2020	1,458,670	201,382	13.8	12.1	-1.2	7.0	36.1
2nd quarter 2020	1,301,259	203,796	15.7	-3.9	31.8	-3.6	43.8
1st quarter 2020	1,354,477	154,575	11.4	-1.2	2.2	2.0	14.0
<b>Not Adjusted</b>							
1st quarter 2021(p)	1,469,450	196,658	13.4	-5.1	-16.7	16.2	39.0
4th quarter 2020	1,548,016	235,957	15.2	6.0	23.2	7.0	31.9
3rd quarter 2020	1,460,101	191,573	13.1	10.6	-1.1	7.0	36.3
2nd quarter 2020	1,320,701	193,624	14.7	4.4	36.8	-3.4	43.7
1st quarter 2020	1,264,772	141,521	11.2	-12.6	-20.9	2.7	13.8

(p) Preliminary Estimate. (r) Revised Estimate.

# Importance of Retail Trade (Continued)

- Key Questions:

- Do productivity and other statistics accurately capture growth in E-Commerce?

- Rapid growth during pandemic, but E-Commerce share of retail trade 13.6%

- In 1998 E-Commerce 0.2% and by 2019 10.7%

- UK and private sector for U.S. suggest larger shares (30% and 20%)

- But for many important products there is limited use of E-Commerce:

- Including motor vehicles, furniture, food and beverages, and building materials and garden supplies.

- Also, E-Commerce hard to define and measure

- Mix of “sales” modes

- Retail trade and more broadly distributive trades have had relatively fast growth in productivity, but there are many issues regarding the net impact of measurement concepts, classifications, methods, and the consistency and accuracy of firm survey reporting on the ability of the data to reflect transformation in retail trade.

- These measurement issues are important not only to BLS, but to BEA and Census.

# BLS/CNSTAT Study Charge

- Value and specifications for a satellite account for retail-related employment and labor productivity
- Informal motivation for request
  - Contributions of related sectors not captured: wholesale, warehousing, transportation, ...
  - Big changes occurring in sector not really reflected in labor productivity statistics

# Study Process

- Interviewing experts
- Appointing panel
- 3 virtual panel meetings
  - Public workshop at 2<sup>nd</sup> meeting
- Panel consensus on report
  - Revised report after internal feedback
- 7 external peer reviews
- Revised report

# Panel Members:

- J. Steven Landefeld (Chair), *Bureau of Economic Analysis, retired*
- Carol A. Corrado, *The Conference Board*
- Gregory Duncan, *Amazon and University of Washington*
- Teresa Fort, *Dartmouth College*
- John C. Haltiwanger, *University of Maryland – College Park*
- Dale W. Jorgenson, *Harvard University*
- Michael Mandel, *Progressive Policy Institute*
- Kelly McConville, *Reed College*
- **Leonard Nakamura**, *Federal Reserve Bank of Philadelphia*
- **Wesley Yung**, *Statistics Canada*

**CNSTAT Co-Study Directors:** *Stuart Elliott and Nancy Kirkendal*



# Transformation of the Retail Sector

- Rise of warehouse clubs and supercenters
  - Share of retail trade increased from 5% in 1997 to 11% in 2019.
- E-Commerce
  - Share of retail trade rose from 0.2% in 1998 to 10.7% in 2019
    - And to 13.6% by the first quarter of 2021.
- Digital transformation of some goods
  - Books, music, video ...
- Increasing role of large firms:
  - Census - share of 8 largest firms increased from 12% in 1997 to 20% by 2012 and according to industry sources over 50% by 2021.
    - Census – share of firms with 10,000+employees 54% in 2017.
- Increasing role of imports
- Increasing product variety and role of other services
- COVID-19 acceleration of trends

# Transformation of the Retail Sector

- Key implications
  - Stable relationships changed:
    - Wholesale sector moved goods between manufacturers and retailers without directly interfacing with final consumers.
    - The warehousing sector stored goods in the transition from manufacturer to final consumer,
    - and the transportation sector moved goods between manufacturer, wholesaler, retailer, and final consumer.
    - Retail trade functions can be spread across all these sectors making measurement of retail trade over time difficult
  - Different cost structure for large/small retailers
    - Large: include wholesale, warehousing, transportation
    - Large: may outsource customer service, order fulfillment
    - Important for measurement and analysis
  - Shifts and growth of retail services
    - Some things leave the sector: video streaming
    - Some changes in services: e-commerce shopping services
    - Increased e-commerce services can be measured as a decline in productivity if the value of those services are not measured.

# Key Issues: Outputs

- Goal: output measure that better reflects the services that retail trade provides
  - Nominal output:
    - Gross margin
    - Value-added
  - Real output:
    - PPI deflators
    - Deflator extensions to reflect added retail services related to variety, choice, comparison, delivery, household time and resources in shopping
    - Current method (CPI deflation of Sales) may overstate real growth in high-tech retail sales and understate growth in other product sales

# Use of Sales or Gross Output May Overstate the Nominal Output and Productivity of Retail Sales

- The NAICS Retail Trade sector comprises **establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise**. The retailing process is the final step in the distribution of merchandise; retailers are, therefore, organized to sell merchandise in small quantities to the general public.
  - These incidental services are what retailers "produce" and they include: purchasing a wide variety of products in bulk for sale in small quantities to customers; information and advice on the products they sell; credit facilities; and delivery services.
  - Use of gross sales overstates either the net income of the retailer (sales less cost of goods sold) or the value-added costs (wages, rent, interest, and proprietors income) that covers the services the retailer provides.
  - As a result, the CNSTAT panel recommended (see below) the use of either the gross margin or value-added measures of the output of retail trade.

# Key Issues: Outputs

- Sales output measures and CPI deflators
  - Sales confounds changes of goods themselves with changes in retail services
    - Doesn't adjust for difference in cost structures and retail services between large and small retailers
  - Use of sales + CPI reflects data limits
    - Sales revenue available monthly, not input costs
    - Until recently only CPI for deflating goods, not PPI for deflating retail services
  - Tension: conceptual goal vs. available data

# Other Measures Suggest Retail Trade May be Understated

- Alternate measures of retail trade that measure the real (inflation-adjusted) value of the services provided by retail trade rather than the real value of the goods and services they sell suggest that growth in retail sales may be understated.
  - CNSTAT Recommendations:
    - Replace existing product (CPI) based price indexes to calculate real output for retail trade with:
      - Value added or margin price indexes
      - Hedonic price indexes that measure the value/price of the services provided by retail trade including: variety, comparison pricing (including technical specifications of products), home delivery, saving in shopping time, record keeping, return policies, etc.

# Other Possible Sources of Bias/Noise in Output of Retail Trade to the Economy

- E-Commerce that is business to business (B2B) should be excluded from retail trade/final sales and recorded as intermediate manufacturing, wholesale, and services sales
- Similarly, E-Commerce that is direct from business to households should be excluded from manufacturing, wholesale, and services sales and counted as final sales.
  - If some of these final sales to households are included in non-retail trade industries sales, retail trade and final sales will be understated, as will the E-Commerce share of retail trade
  - This misclassification could also cause GDP, as measured by final sales, to be understated.

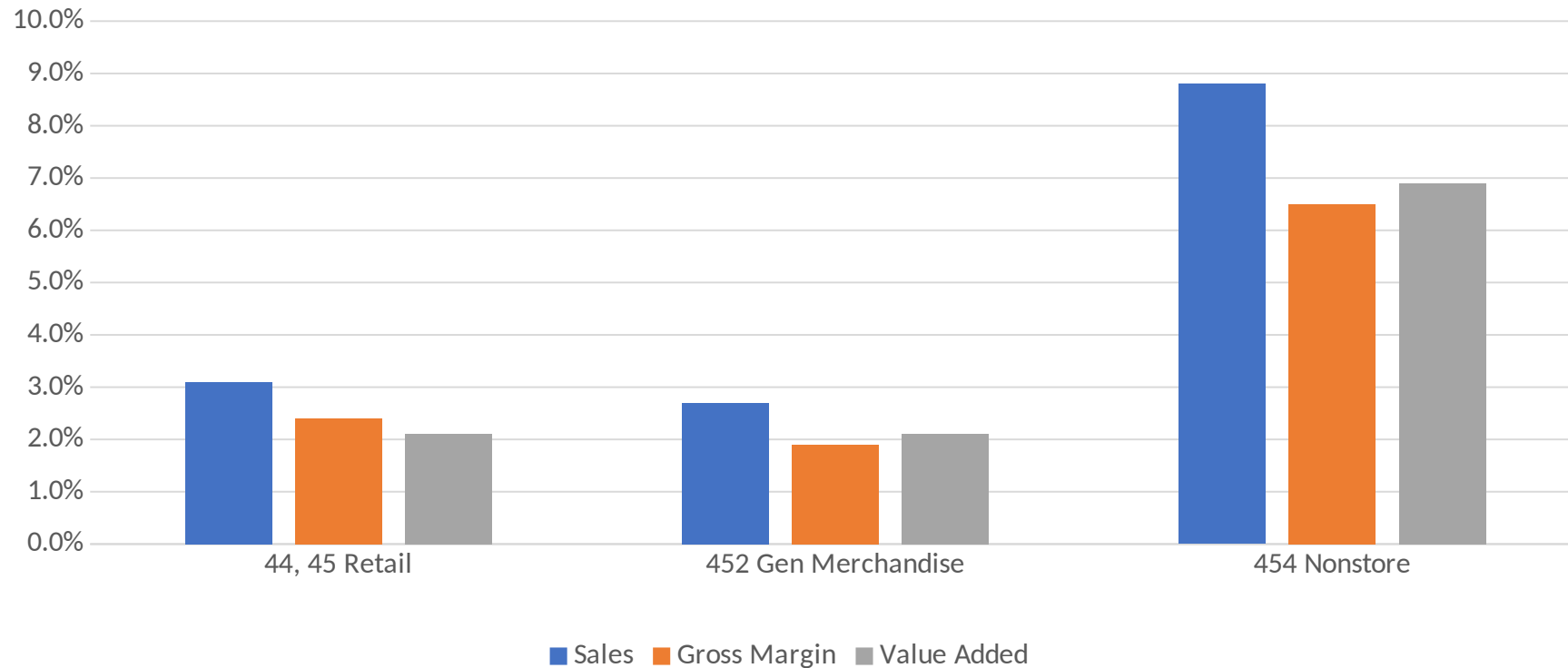
# Key Issues: Outputs

- Implications:
  - Use multiple available measures
    - Reflect different trade-offs between conceptual goal and data limits
  - Experiment with new measures
    - Opportunities for using private data

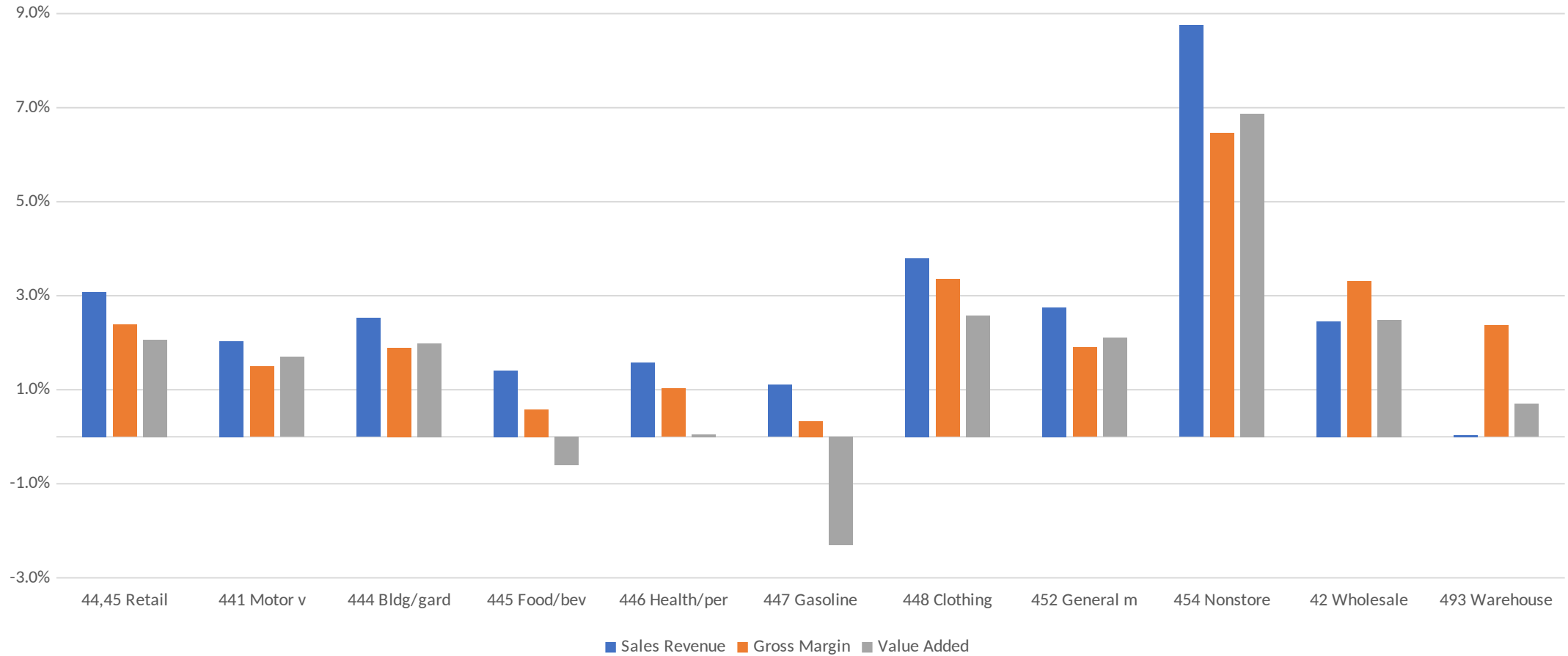


# Transformation of the Retail Sector

Average Annual Change in Labor Productivity, 1997-2018, by Output Measure



# Average Annual Change in Labor Productivity (Detail)



## Key Issues: Identifying Retail and Retail Related Industries

- Growth in large retail trade firms that use their own warehousing and distribution services may result in growth in retail trade that is really just a reallocation of the same overall level of economic activity from warehousing and other industries supporting retail trade to retail trade.
  - Treatment of auxiliaries under NAICs may also complicate
- Rapid rise in E-Commerce may complicate reporting if manufacturing or warehouses have problems in separating business to business sales from direct sales to consumers.
  - May not only affect trend but cycle (2020/2021?)

# Key Issues: Identifying Retail-Related

- Goal: “retail supporting” but how to identify relevant outputs and inputs?
  - NAICS codes for supporting industries like warehousing combine retail-related and not
  - Separate business registers add more noise:
    - BLS data on employment, prices
    - Census data on output

# Key Issues: Identifying Retail-Related

- Implications
  - Use multiple available measures: start with feasible lower and upper bounds of
    - NAICS codes for retail establishments ...
    - Lower: + all industries focused on supporting retail
    - Upper: + all industries partially supporting retail
  - Experiment with new measures
    - Collaborative effort to investigate solutions
    - Consider using private data
    - Involve industry to keep up with change

# Key Issues: Inputs

- Goal: quality-adjusted labor input
  - Existing measures
    - Unadjusted labor input
    - Adjusted labor input reflecting education, age, gender
  - New measures that could reflect high-end skills supporting e-commerce
- Implications
  - Use multiple available measures
  - Experiment with new measures

# Recommendations (paraphrased)

1. BLS should develop a satellite account for an expanded retail trade sector in collaboration with BEA and Census.
2. The interagency team should solicit input and advice from industry and academia, with a special focus on collaborating with industry.

# Recommendations (paraphrased)

## 3. The interagency team should:

- adopt an **iterative and modular approach**, starting with feasible options
- provide a set of estimates in a **central module, with submodules** to investigate side questions or alternative measures
- outline a set of **studies** to investigate questions and suggest improvements.



# Recommendations (paraphrased)

4. The satellite account should cover all retail and retail-supporting establishments, identified by combining available information.
5. The satellite account should examine multiple measures of output, deflators, and labor input.

# Recommendations (paraphrased)

6. Experimental submodules should address specialized issues:

- International trade and global value chains
- Digitization
- Labor quality
- Providing real-time and subsector analyses.

# Recommendations (paraphrased)

7. Measures should be taken to facilitate data sharing to reconcile business lists across statistical agencies.
8. BLS, BEA, Census, and IRS should establish a task force to develop a plan for a single consolidated Business Register.

# Recommendations (paraphrased)

9. Some data issues need to be addressed:
  - Survey gaps related **input costs, auxiliaries**
  - Data to estimate **hours split** between retail- and nonretail-related service industries
  - Correcting **numerator and denominator misalignment** in labor productivity from different business registers
  - Exploring **private sector data** for timeliness and detail.

# Questions and Discussion

Thank you!