ECONOMIC STATISTICS CENTRE OF EXCELLENCE

A COLLABORATION WITH Office for National Statistics

ESCoE Research Seminar

Accounting for Improved Brick and Mortar Shopping

Presented by Rachel Soloveichik (BEA)

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Bureau of Economic Analysis
U.S. Department of Commerce

NIESR Seminar

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Introduction

"Free" shopping experiences are currently excluded from industry output, final output and GDP.

- I assume a barter transaction: shoppers give sales attention in return for experiences.
- Both consumers and businesses shop to get information.

This paper focuses on the wholesale and retail sector.

Three Types of Shopping Experiences

Verbal	Display	Tactile
		
Salespeople **interact individually** with customers.	Customers **visually inspect** merchandise on shelves.	Customers **touch, taste or test** product samples.

Preview of Talk

Shopping Category	Verbal	Display	Tactile
Nominal Output Impact in 2016	$318B	$240B	$158B

Real industry growth impact Percentage points per year		Verbal	Display	Tactile
	2002-2016	0.02%	0.23%	0.16%
	1975-2002	-0.08%	-0.04%	0.08%
	1929-1975	-0.01%	0.08%	0.01%

Industry TFP growth impact Percentage points per year		Verbal	Display	Tactile
	2002-2014	0.21%	0.25%	0.22%
	1975-2002	0.08%	-0.06%	0.06%
	1948-1975	-0.44%	-0.11%	-0.03%

Current vs. Experimental Methodology

Current Treatment of “Free” Shopping Experiences:

- Not tracked as industry output or input, or personal consumption.
- Measured GDP rises when “free” consumer shopping experiences are replaced by paid consumer shopping experiences.

Experimental Treatment of “Free” Shopping Experiences:

- Just like paid shopping experiences — tracked as industry output, industry input or personal consumption.
- “Free” experiences are valued based on production cost.
- Value of sales attention = value of “free” experiences.

Measuring Sales Output

Verbal sales experiences

- Based on Occupational Employment Survey (OES) which tracks earnings by occupation and industry.

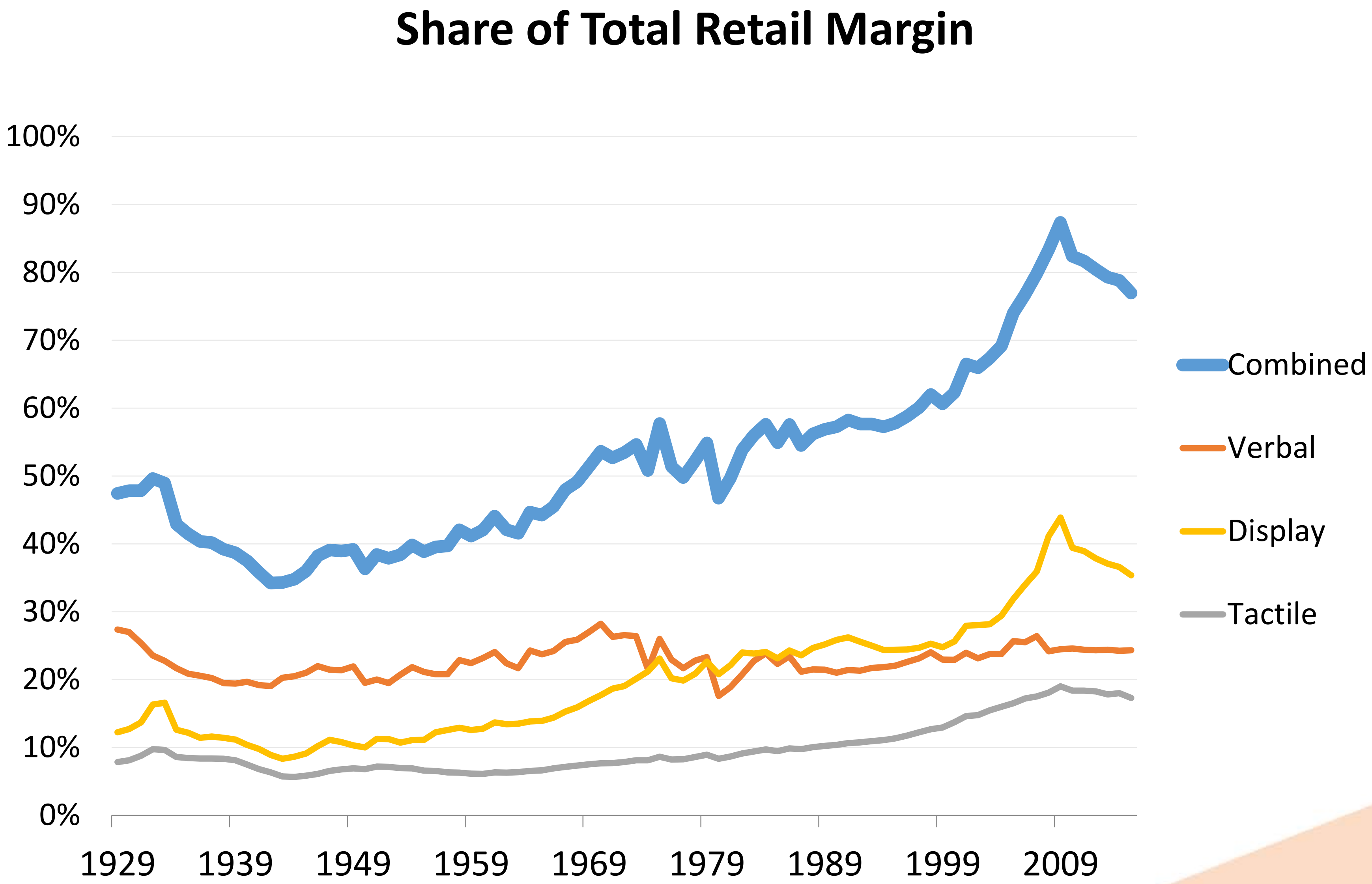
Display sales experiences

- Used BEA's existing fixed asset tables and supply-use tables.

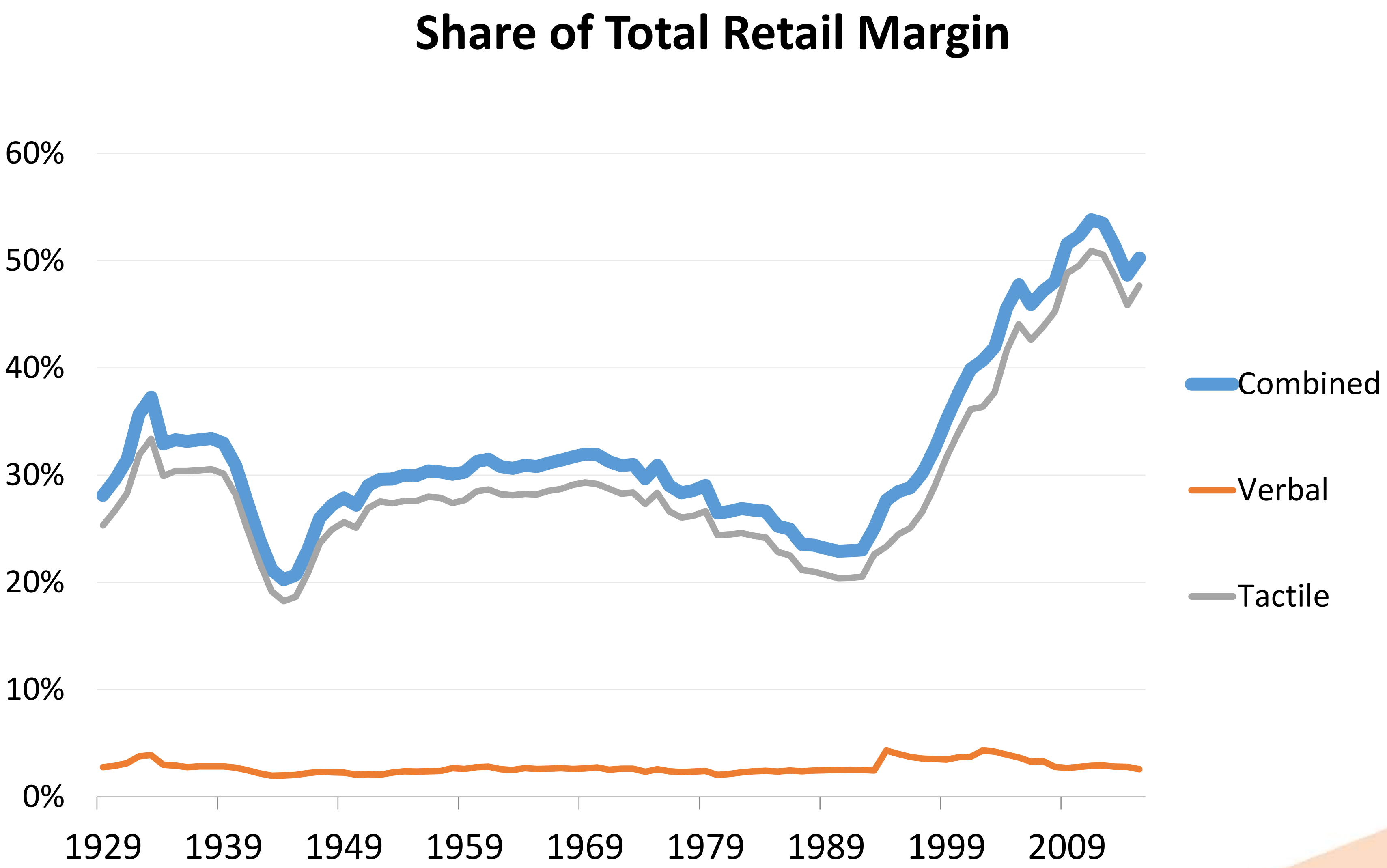
Tactile sales experiences

- "Free" trials frequently damage or destroy goods sampled.
- Retail non-food damage based on National Retail Federation surveys tracking consumer product returns.
- Retail food damage based on USDA research.

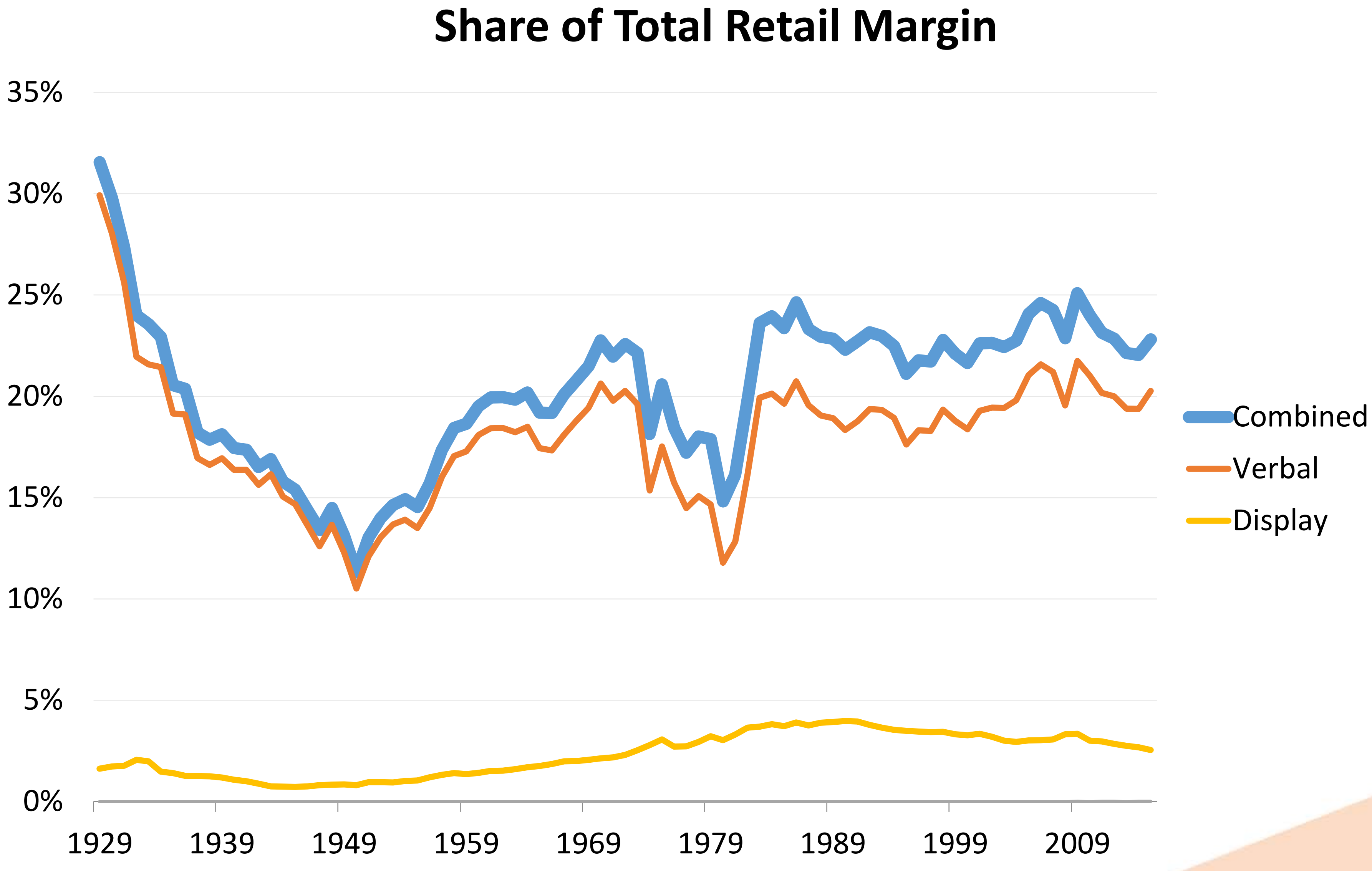
Sales Output for Brick and Mortar Retailers



Sales Output for Online/Mail Order Retailers



Sales Output for Wholesalers



Valuing “Free” Consumer Experiences

Used BEA’s pre-existing I-O tables to allocate shopping between consumers, government and businesses.

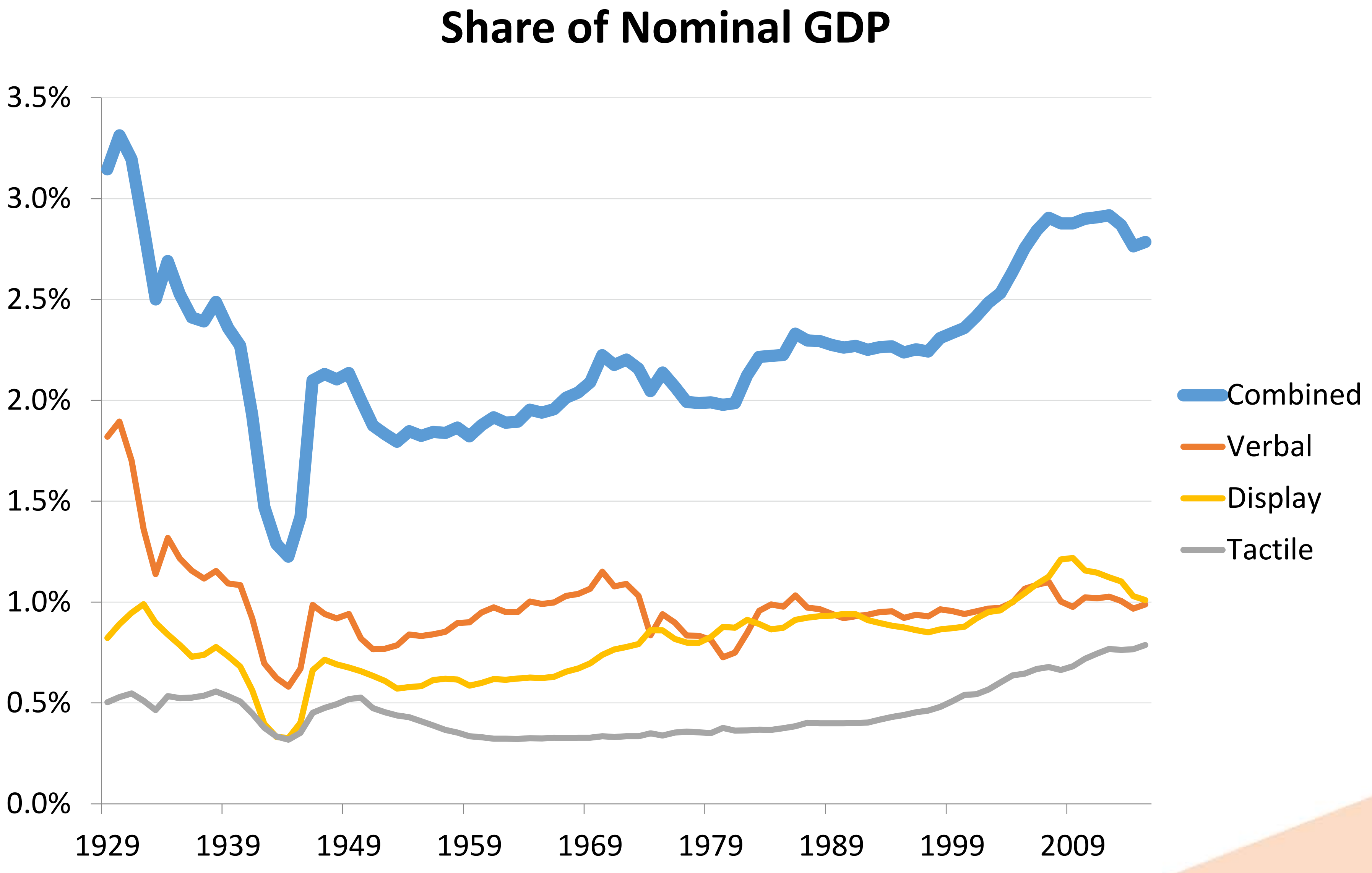
- “Free” experiences benefit the ultimate user of a good.
- Wholesalers stock retail shelves, set up promotional displays, etc.

I value “free” experiences at 50% of total sales output.

- Subtract the small portion which is funded by paid memberships (e.g. Costco)

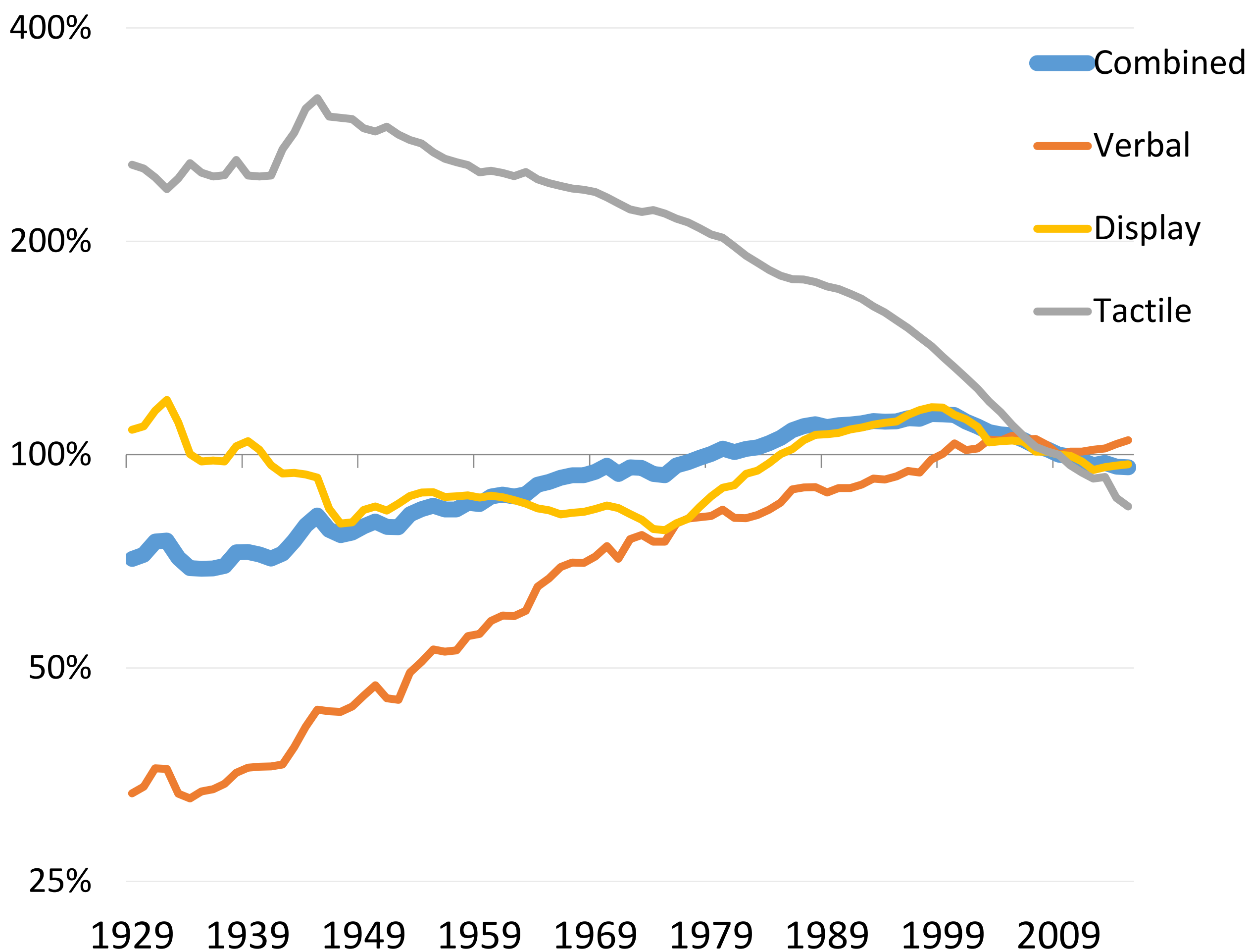
Focused on the wholesale and retail sector, did not consider “free” experiences provided by other industries.

Value of “Free” Consumer Experiences



Prices for Display and Verbal Shopping

Ratio of "Free" Experience Prices to Overall GDP Prices, 2009 Base Year

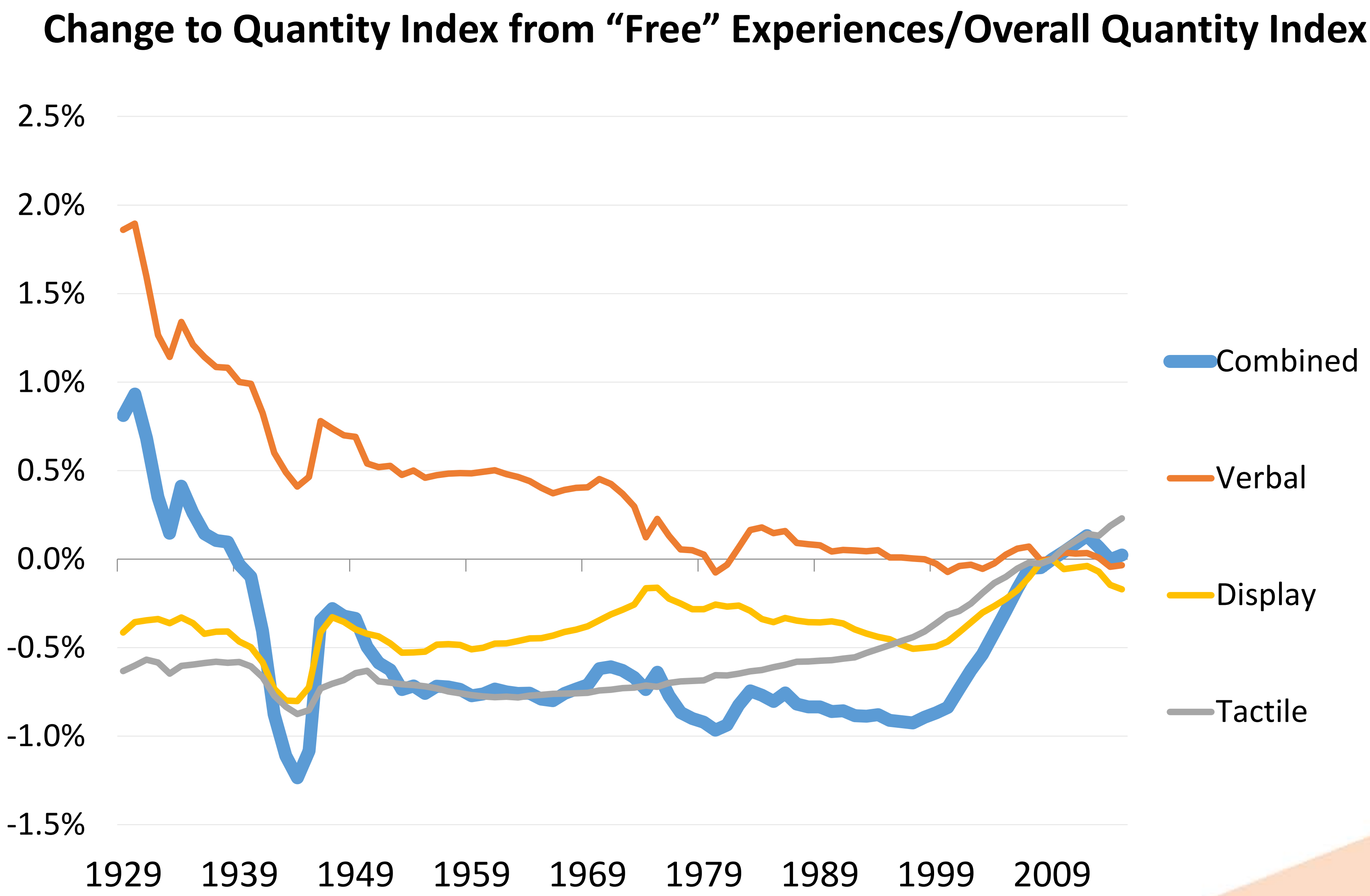


My **verbal price index** is based on quality-adjusted labor costs in wholesale and retail.

My **display price index** is based on the PPI's for mall rental and sign manufacturing.

My **tactile price index** is based on the cost of the "free" goods provided.

Changes to Real GDP from “Free” Experiences



Tracking Sales Attention Over Time

Input prices needed to calculate total factor productivity (TFP)

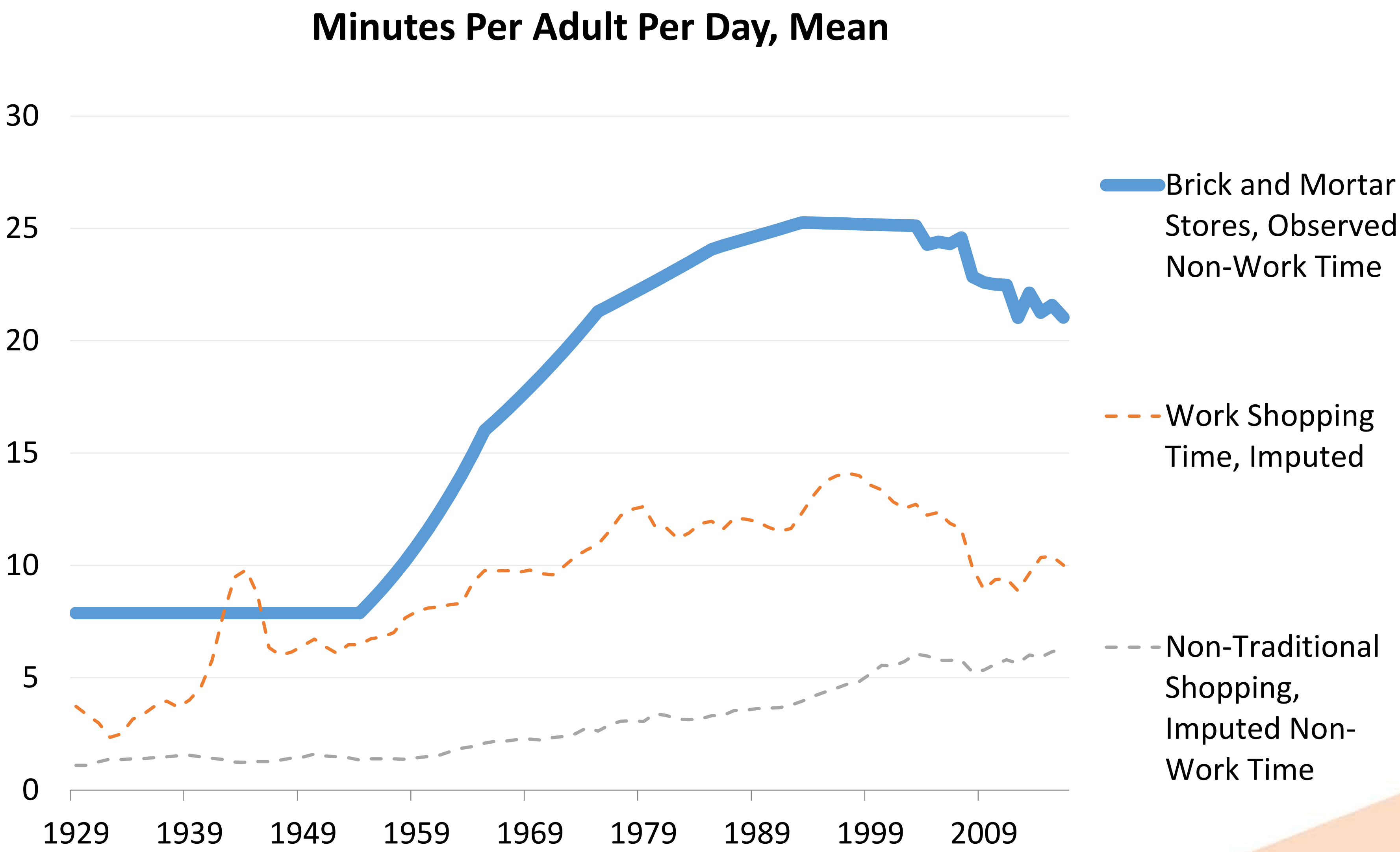
- TFP Impact = (Attention Input Price)/("Free" Experience Output Price)
- Attention Price_t = (Sales Output_t)/(Attention Quantity_t)

The American Time Use Survey (ATUS) provides main dataset.

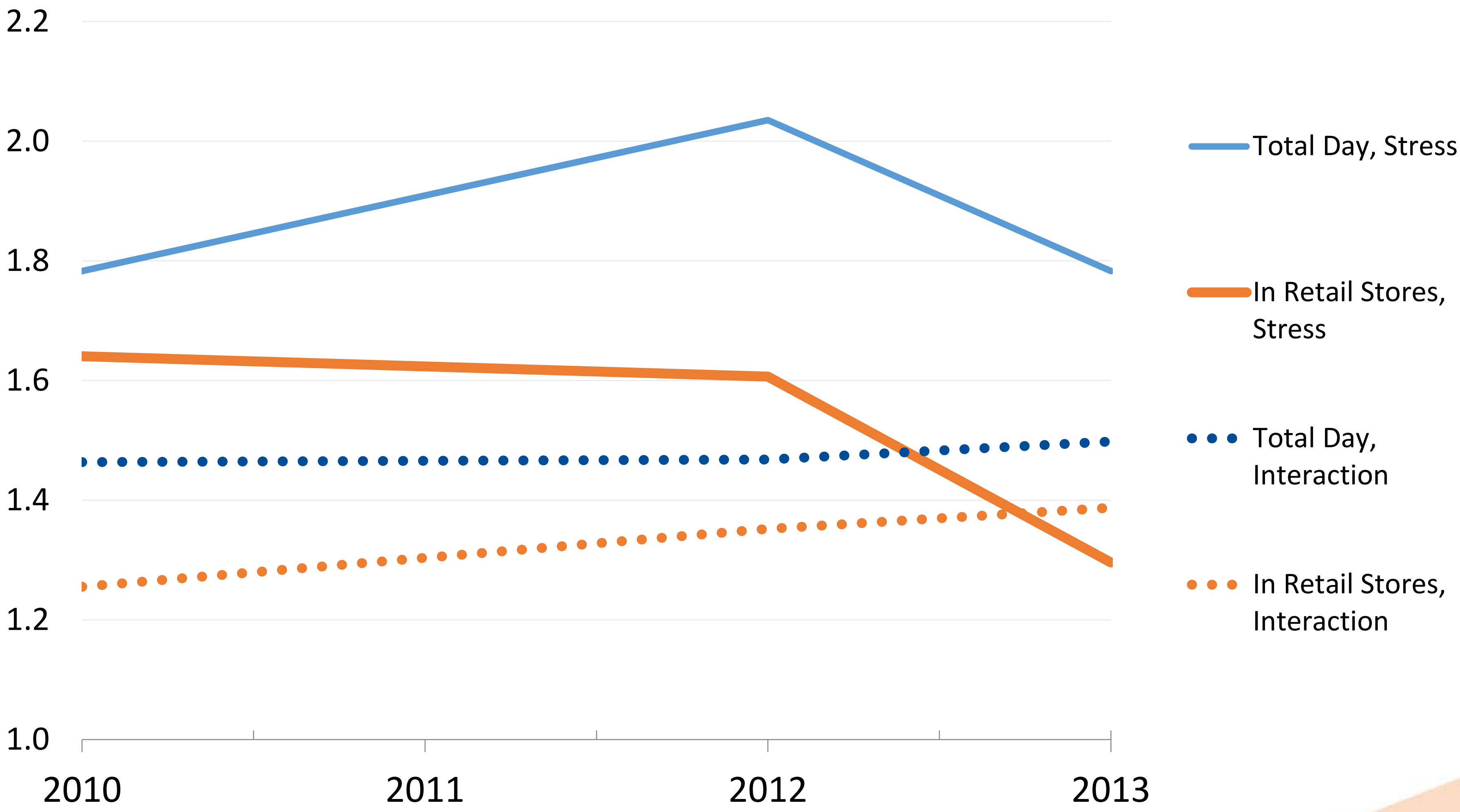
- Provides high quality time diary data since 2003.
- Used reported location to focus on brick and mortar shopping.
- Imputed work shopping time and non-traditional shopping time.

Used historical samples from 1954, 1965, 1975, 1985 and 1993.

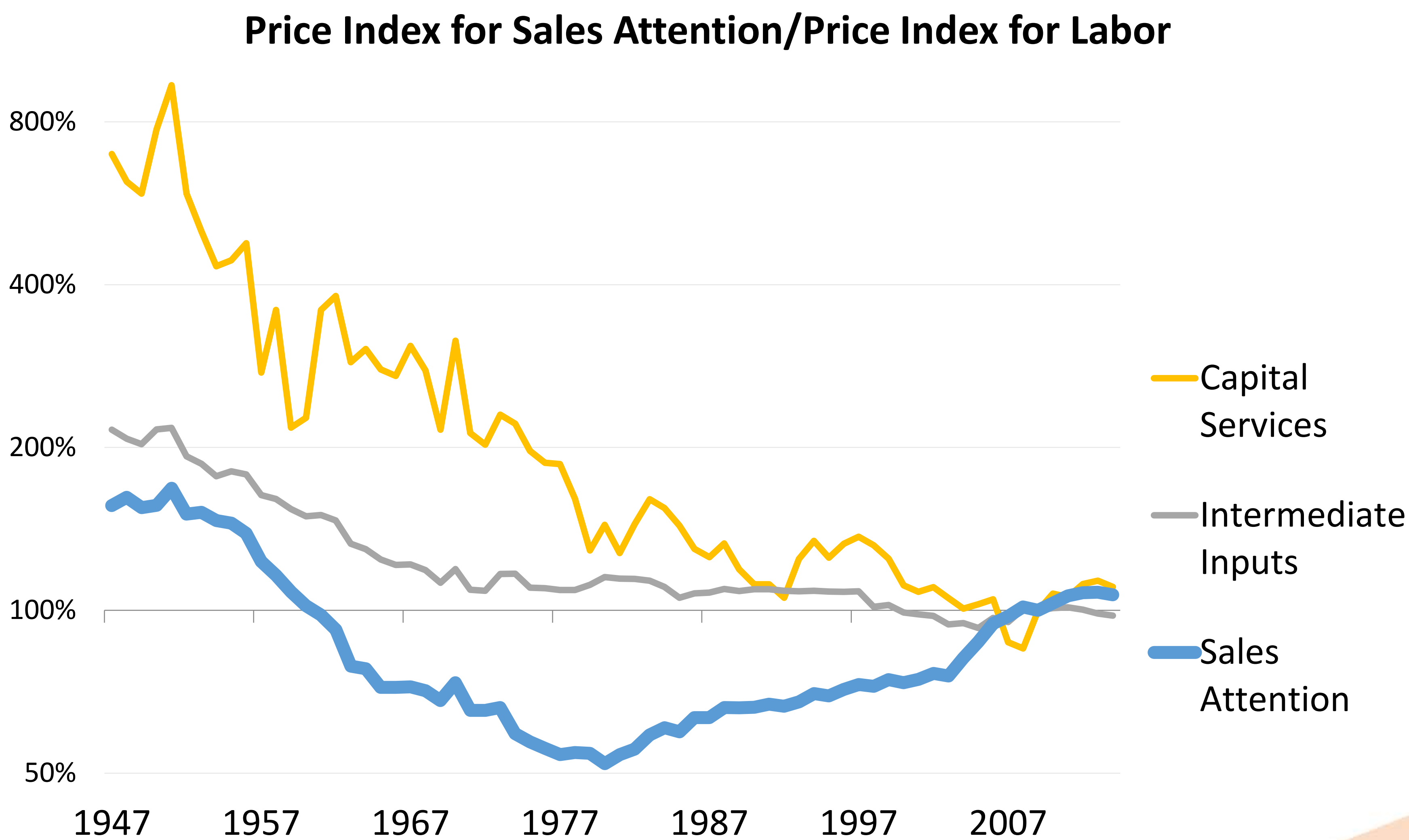
Time Spent Shopping



Mean Self-Reported Emotions, By Activity



Relative Sales Attention Prices



Productivity Impact of "Free" Shopping

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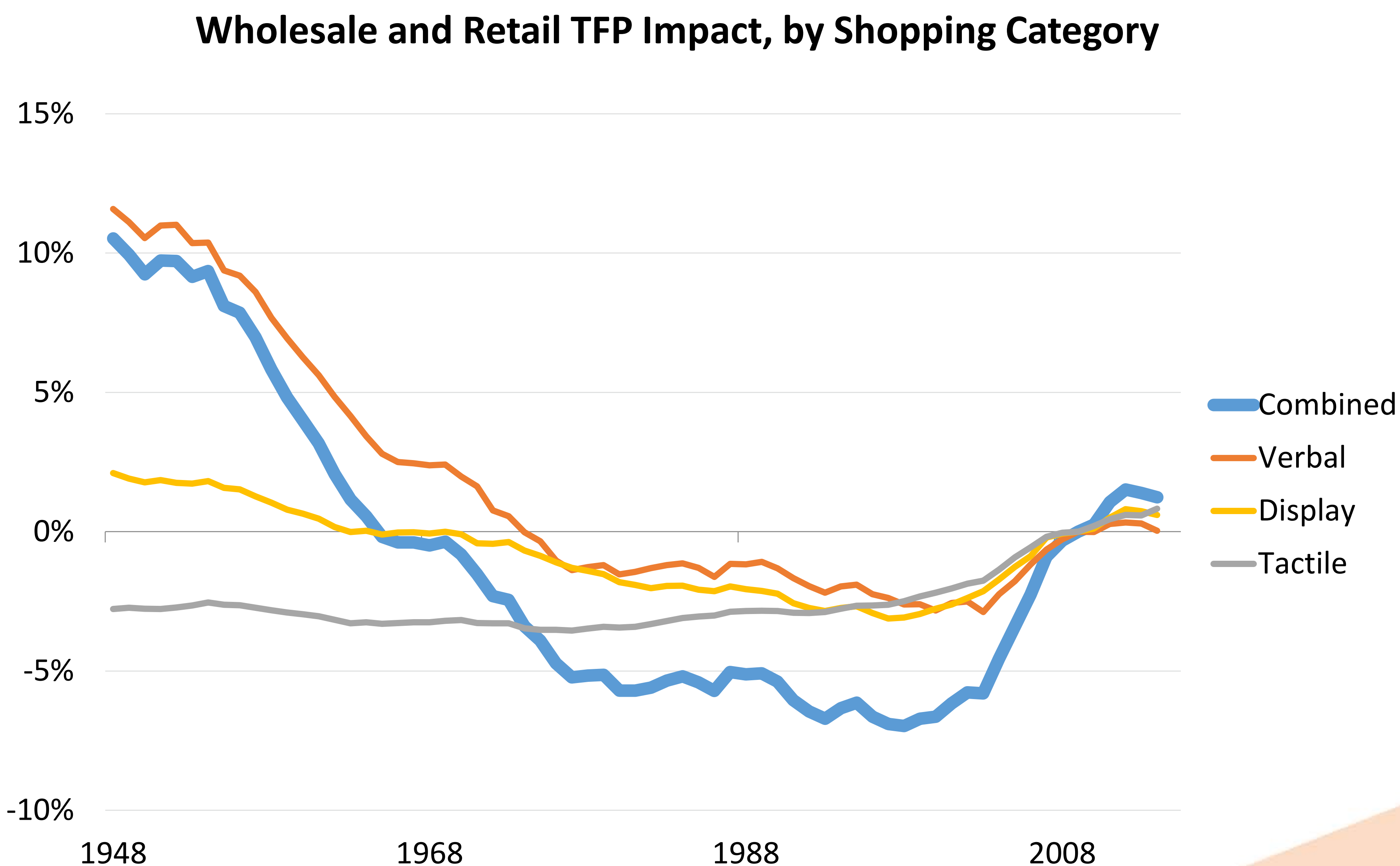
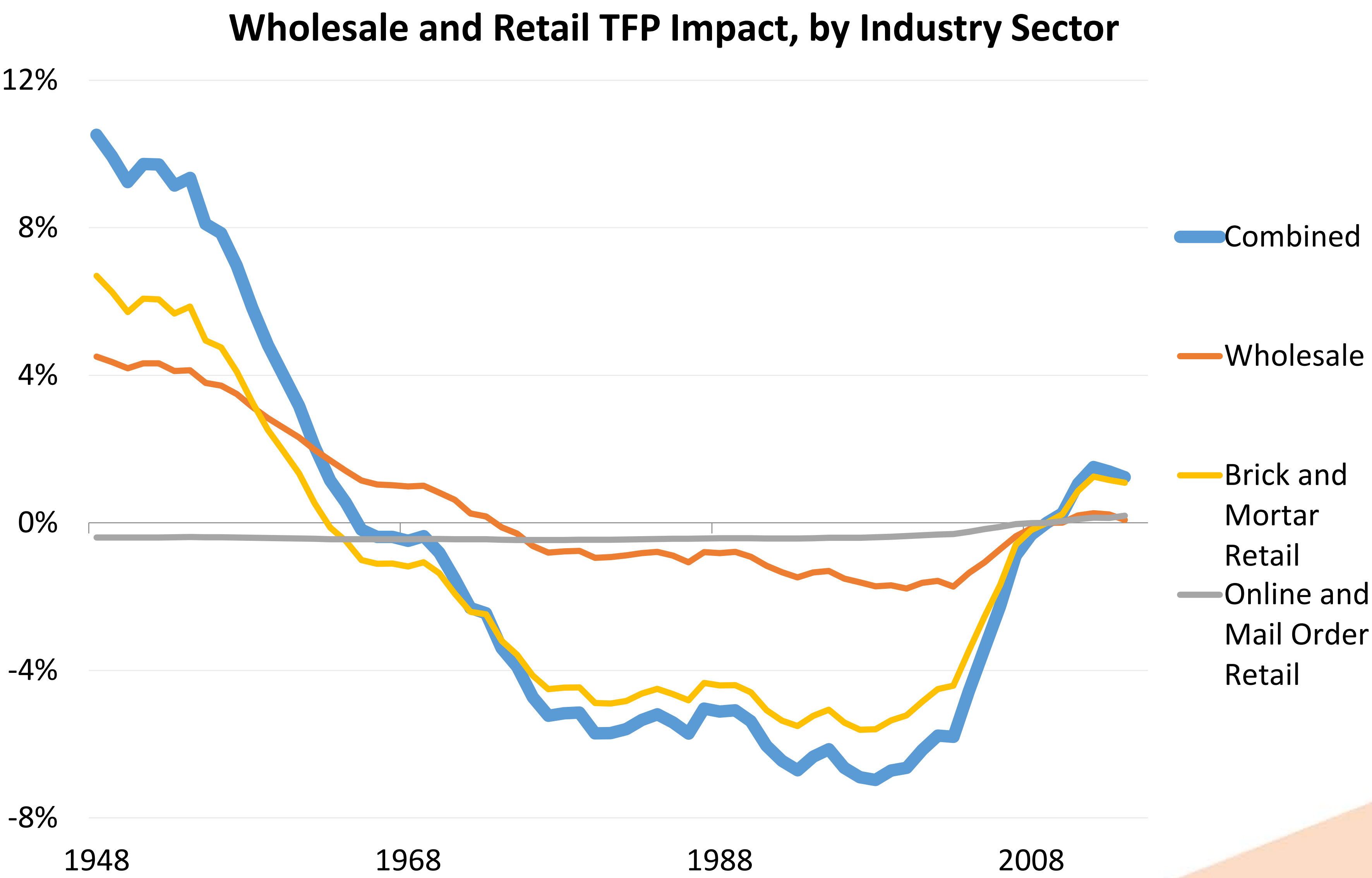
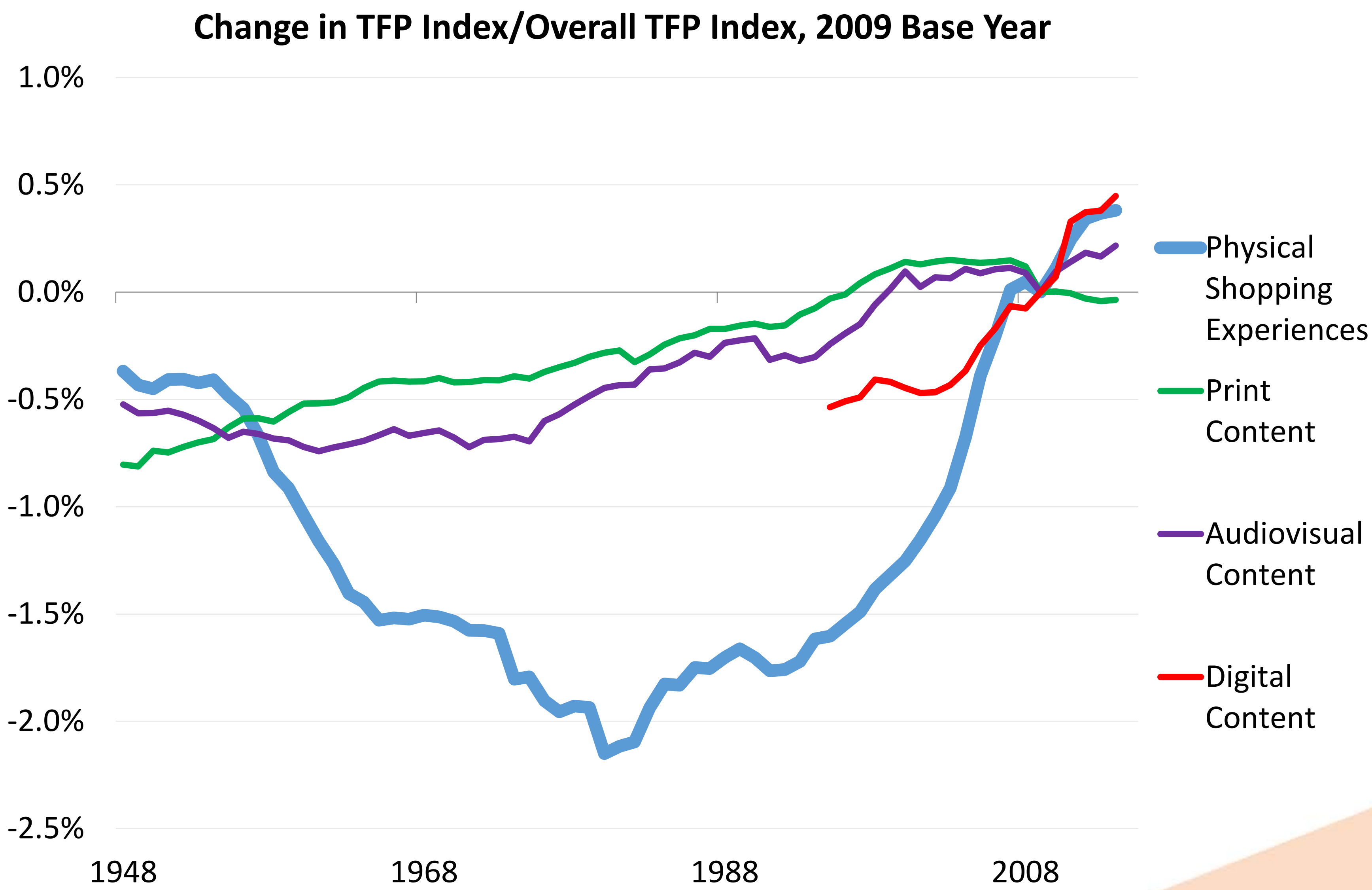


Productivity Impact of “Free” Shopping



Aggregate Productivity Impact of “Free” Stuff



Conclusion

Overall GDP Percentage points per year	**2002-2016**	**1975-2002**	**1929-1975**
Nominal GDP growth	3.81%	7.18%	5.09%
Real GDP growth	1.83%	3.29%	2.95%
TFP growth	0.27%	0.54%	1.22%

"Free" Experience Impact Percentage points per year	**2002-2016**	**1975-2002**	**1929-1975**
Nominal GDP growth	0.02%	0.01%	-0.02%
Real GDP growth	0.05%	0.00%	-0.03%
TFP growth	0.12%	0.03%	-0.05%