

“Free” Media and Information



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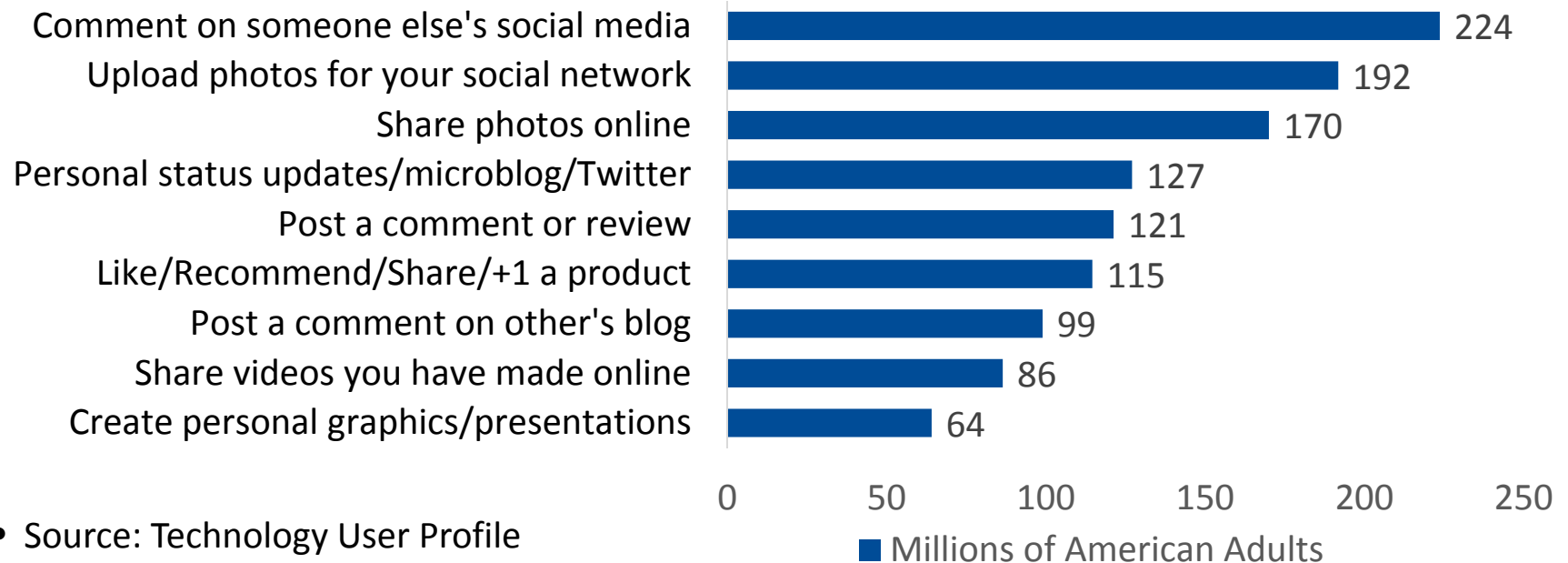
BEA Advisory Committee Meeting

May 10, 2019

- A small amount of content is sold explicitly
 - Currently tracked in the NIPAs directly
- Other content is bundled with sold products
 - For example, a flour bag might include recipes
 - Currently tracked in the NIPAs indirectly
- Most content is offered “free”
 - “Free” content is currently not tracked in the NIPAs
 - Some researchers have argued that tracking “free” digital content would reverse the recent productivity slowdown (Brynjolfsson and Oh 2012, Dean et al. 2012, Brynjolfsson et al. 2017, Chen et al. 2014)
 - This presentation tracks “free” content consistently with sold content

- Content as household production
- Content as a barter transaction
 - Media users view advertising in return for “free” media
 - Information users view marketing in return for “free” information
 - Shoppers listen to sales pitches in return for “free” experiences
 - Some users provide personal data rather than viewership/listenership
- The Advisory Committee saw early work on advertising-supported media in 2015
 - Jon Samuels and Leonard Nakamura have since joined the project
 - We study marketing, productivity and user-generated content

User-Generated Content in 2016



User-Generated Content is a one-way transaction:

- Volunteers offer content to the public without any expectation of payment
- Like other volunteer services, user-generated content is considered household production and is out of scope for GDP
- Including user-generated content in GDP would raise the nominal GDP level by 51 billion in 2016 and the growth rate by 0.04 percentage points per year

GDP Impact of “Free” Content



	Nominal GDP level (2016)	Real GDP Growth percentage points per year		
		2005-2017	1995-2005	1929-1995
Digital Content	159B	0.11%	0.11%	-
Audiovisual Content	236B	0.05%	0.06%	0.03%
Print Content	59B	-0.04%	0.01%	0.02%
Shopping Experiences	524B	0.03%	0.06%	-0.03%
Total	978B	0.16%	0.24%	0.03%

Productivity Impact of “Free” Content



	Nominal GDP level (2016)	Productivity Growth percentage points per year		
		2005-2017	1995-2005	1929-1995
Digital Content	159B	0.12%	0.04%	-
Audiovisual Content	236B	0.02%	0.04%	0.01%
Print Content	59B	-0.04%	0.04%	0.04%
Shopping Experiences	524B	0.08%	0.12%	-0.03%
Total	978B	0.18%	0.24%	0.02%

•Current Treatment:

- GDP accounts don't track bartered content as industry output, industry input or personal consumption expenditures
- Measured GDP rises when sold content replaces bartered content

•Experimental Treatment:

- Content providers and users are assumed to engage in a barter transaction
 - Value of viewership/listenership/personal data = value of content
- Experimental NIPAs track “free” content consistently with sold content
 - “Free” content appears as industry output, industry input, and personal consumption expenditures
- “Free” content is valued based on production costs

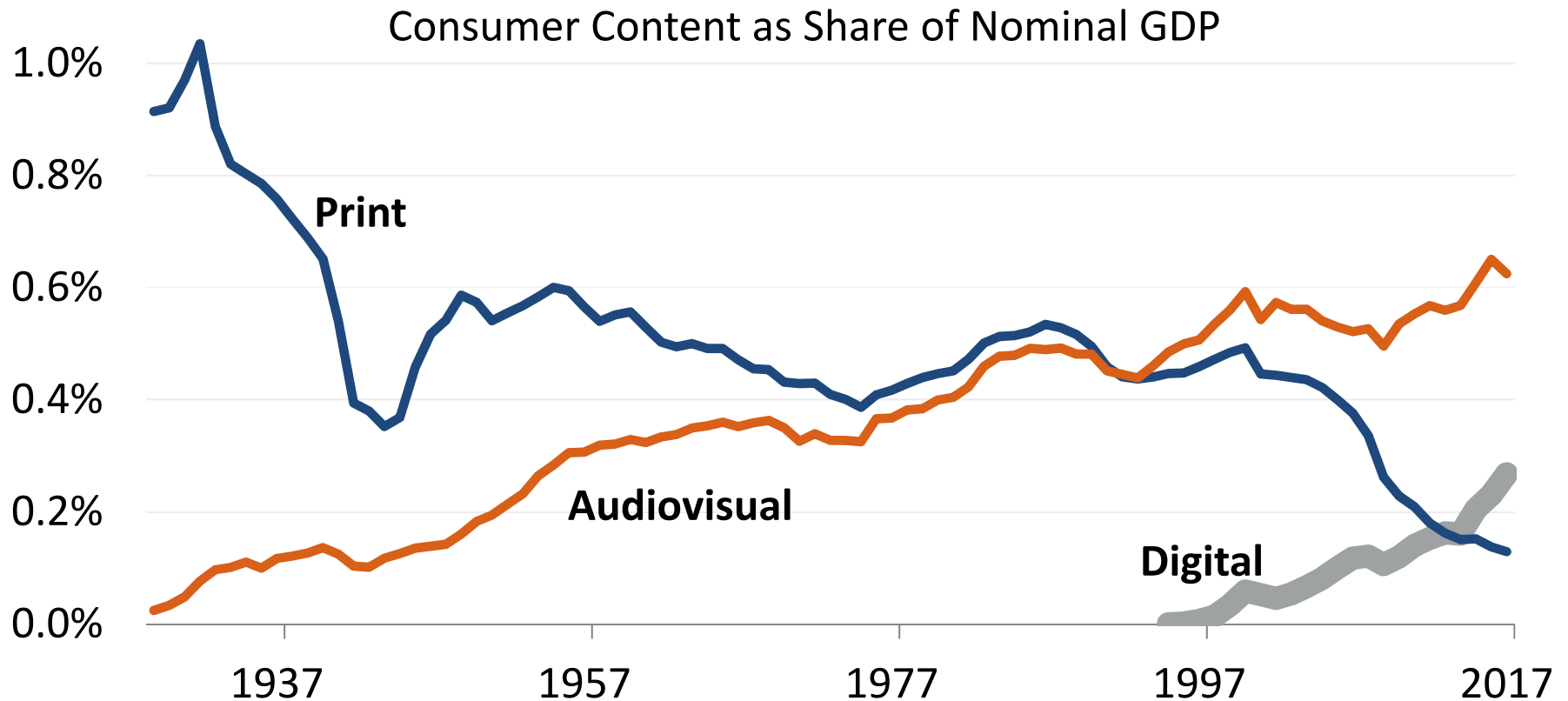
- **Content providers and users engage in barter:**
 - Media users view advertising in return for “free” media
 - Information users view marketing in return for “free” information
 - Shoppers listen to sales pitches in return for “free” experiences
 - Some users provide personal data rather than viewership/listenership
- **Experimental NIPAs track bartered content as industry output, industry input and consumption**
- **Content values are based on production costs**
 - Value of viewership/listenership/personal data = value of content

Derivation of Nominal Content Values in 2012



Data Source Used:	Source Value	Multiplier to Get Content	Content Value
Sold Advertising: Product Line Detail in Economic Census for NAICS 51	\$171B	1	\$171B
In-House Advertising: Industry Literature	-	-	\$8B
Sold Marketing: Product Line Detail in Economic Census for NAICS 54	\$102B	1.36	\$140B
In-House Marketing: Occupational Employment Survey (OES) Data on Marketing Specialist Earnings	\$29B	8.46	\$247B
Verbal Shopping Experiences: OES Data on Sales Specialist Earnings	\$317B	0.87	\$276B
Display Shopping Experiences: BEA Data on Real Estate by Category	\$711B	0.32	\$225B
Tactile Shopping Experiences: National Retail Federation and Industry Literature	\$260B	0.5	\$130B

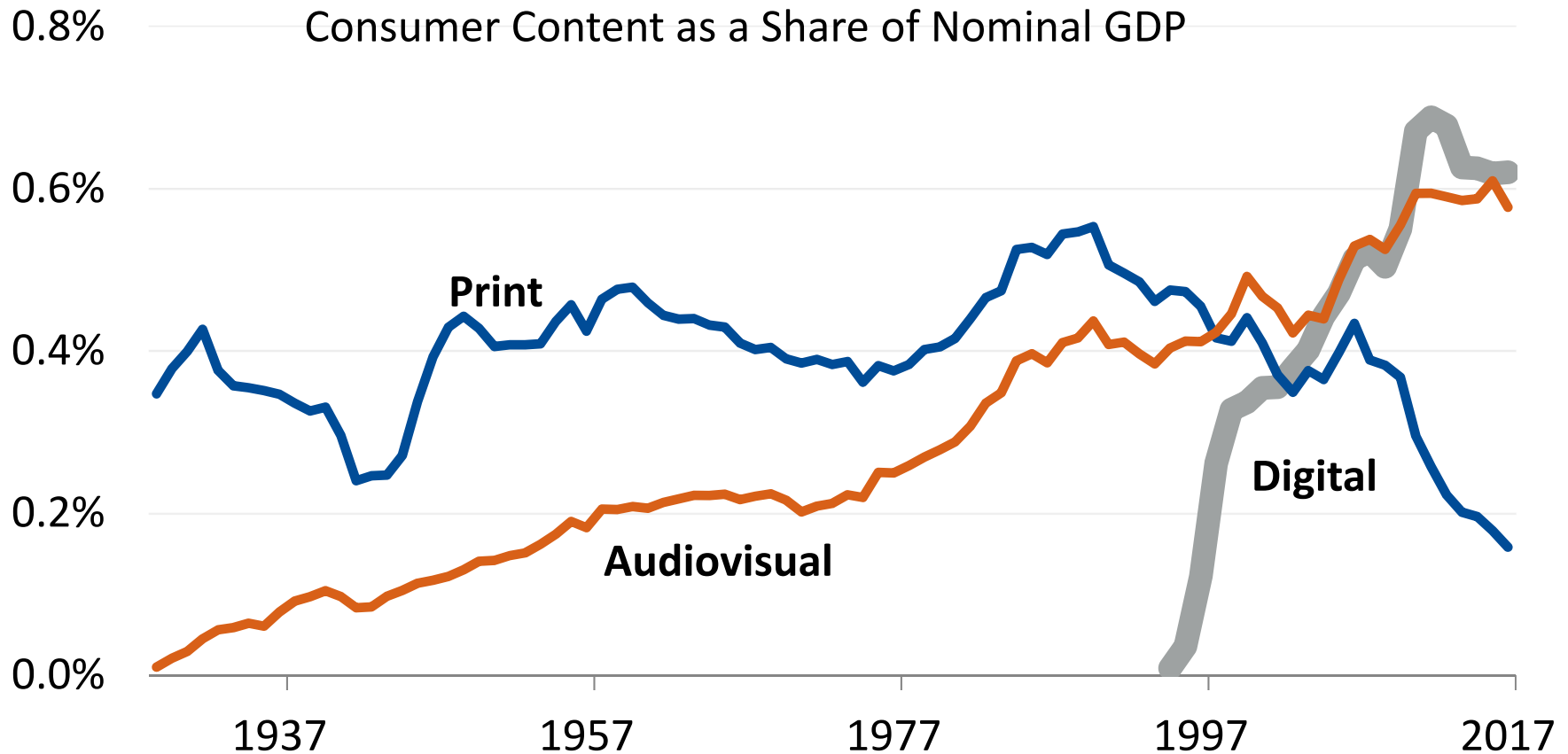
Advertising-Supported Media



Advertising is a three-way impersonal transaction:

- Users barter viewership for media content
- Media companies resell the viewership to outside companies
- Outside companies use the viewership to promote products to the public

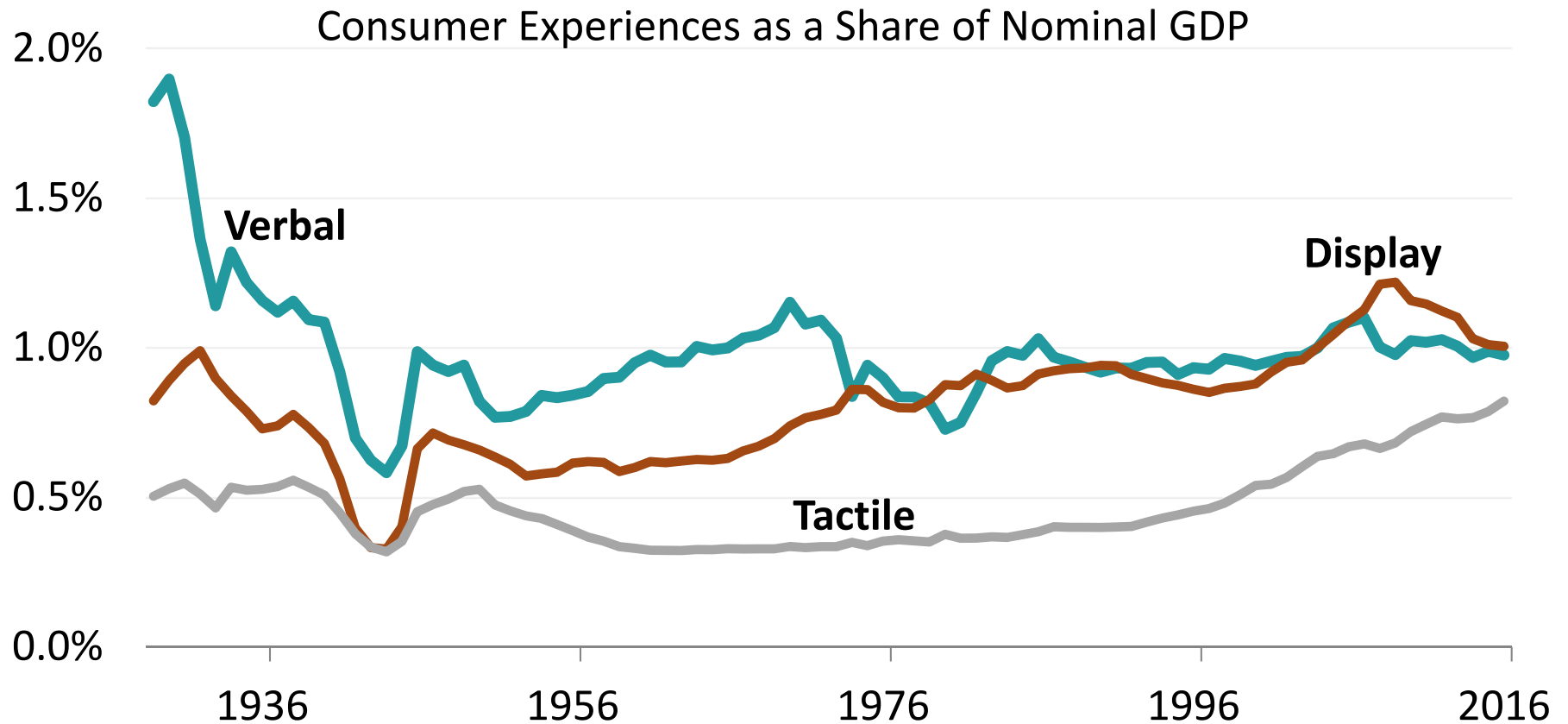
Marketing-Supported Information



Marketing is a two-way impersonal transaction:

- Users barter viewership for marketing content
- Marketers use the viewership in-house to promote products to the public

Sales-Supported Shopping Experiences



Sales is a two-way personal transaction:

- Users barter listenership for shopping experiences
- Salespeople use the listenership in-house to promote products to individuals

- **Advertising-Supported Media:**

- The Economic Census and industry sources track advertising revenue

- **Marketing-Supported Information:**

- The Economic Census reports purchased marketing services
- The Occupational Employment Survey reports employment of marketing professionals, which is then used to track in-house marketing production

- **Sales-Supported Experiences:**

- The Occupational Employment Survey is used to track verbal experiences
- BEA's fixed asset accounts provide values for the real estate used to create display experiences
- National Retail Federation reports are used to track tactile experiences

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- **Sales-Supported Experiences:**

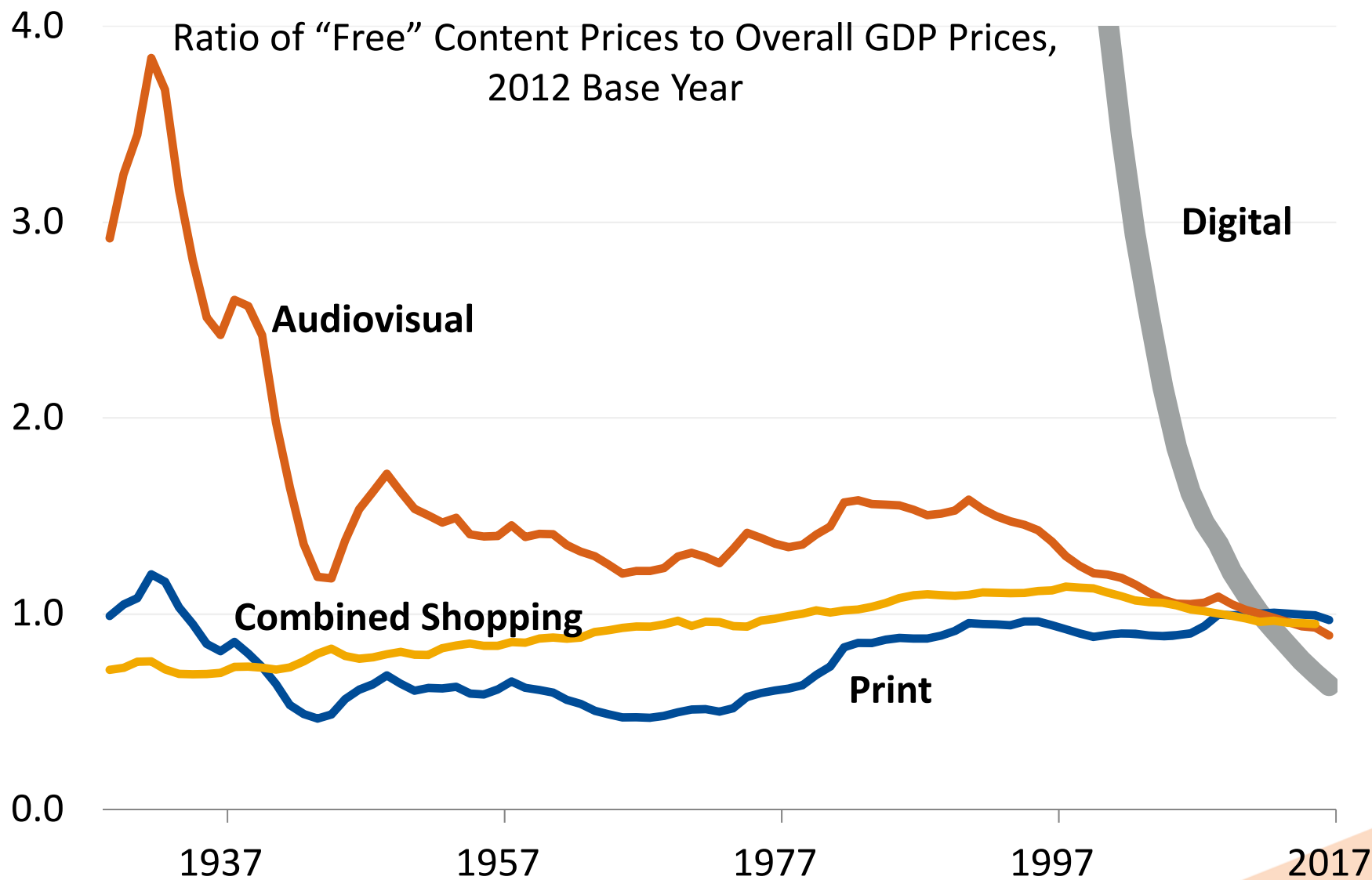
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- BEA's fixed asset accounts provide values for the real estate used to create display experiences
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Derivation of Content Prices

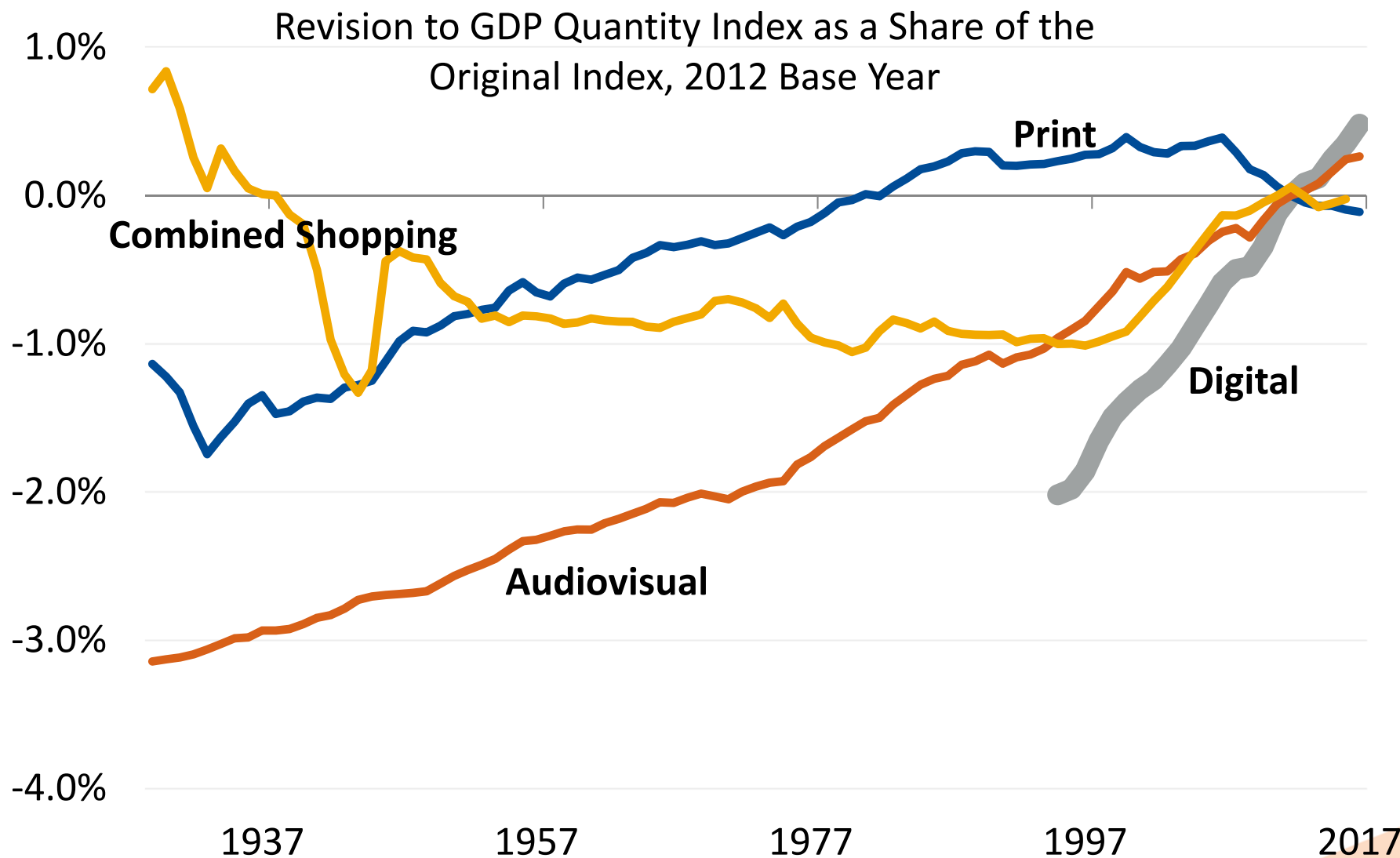


	Proxy Price Series	Weight
Digital	Cloud Services (Byrne, Corrado and Sichel 2018)	0.5
	Own-Account Software (NIPA Table 5.6.4, line 5)	0.5
Audio-visual	Television Originals (NIPA Table 5.6.4, line 24)	0.53
	Sporting Events (NIPA Table 2.4.4U, line 212)	0.13
Print	Telecommunications (NIPA Table 2.4.4, line 97)	0.33
	Book Originals (NIPA Table 5.6.4, line 25)	0.85
Verbal	Salesperson Labor Costs (CIU2010000210000I)	1
Display	Shopping Center Leasing (PCU5311205311201)	1
Tactile	Prices for Goods Damaged (NIPA Table 2.4.4)	1

Relative Prices for “Free” Content

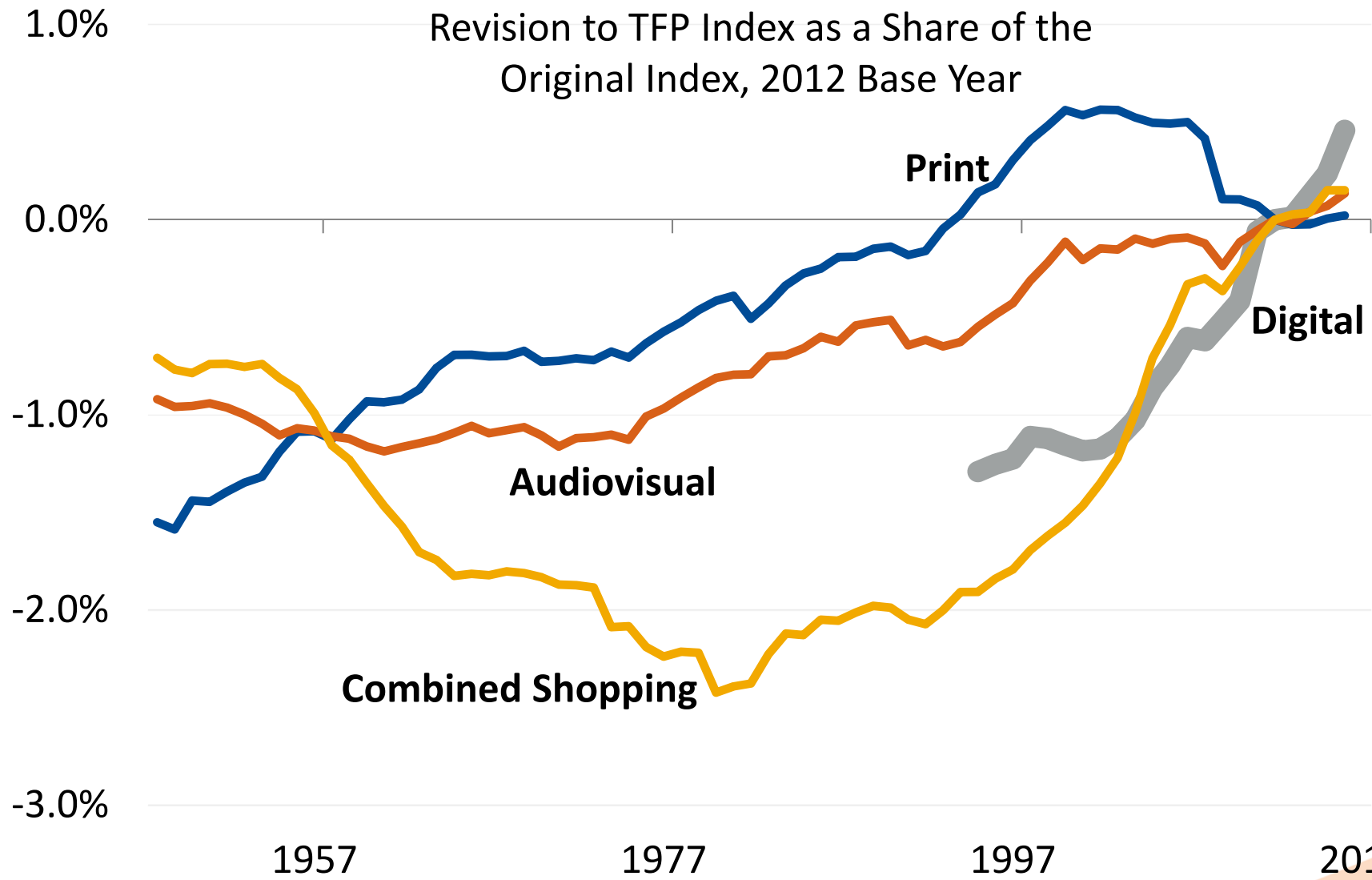


Real GDP Impact of “Free” Content



- Bartered content raises both industry output and industry input
 - Digital content, print content, audiovisual content, verbal experiences, display experiences and tactile experiences are all tracked as new output
 - Digital viewership, print viewership, audiovisual viewership and sales listenership are all tracked as new intermediate inputs
 - $TFP = (\text{User Service Input Price}) / (\text{"Free" Content Output Price})$
- We calculate TFP for each of the 61 private sector industries tracked by BEA and BLS in their joint production accounts
 - Results for individual industries or sectors are available upon request

TFP Impact of “Free” Content



- **Businesses produced \$1.4 trillion of “free” content in 2016:**
 - \$252 billion of advertising-supported media
 - \$465 billion of marketing-supported information
 - \$716 billion of sales-supported experiences
 - Nominal GDP rises by \$1 trillion when “free” consumer content is included in personal consumption expenditures
- **Tracking content increases growth after 2005:**
 - Nominal GDP growth increases by 0.01 percentage points per year
 - Real GDP growth increases by 0.16 percentage points per year
 - TFP growth increases by 0.18 percentage points per year

- **BEA's Digital Economy Satellite Account**
 - Contribute to the 'Digital Media' component
- **OECD's Initiative on Digital Supply-Use Tables**
 - Contribute to 'Data and Advertising Driven Digital Platforms' industries/products
- **International Statistical Standards**
 - Contribute to collaborative efforts with international organizations and statistical offices to introduce future improvements in economic measurement