Valuing 'Free' Media in GDP: An Experimental Approach

by

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Discussed by

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Motivation and goal of the paper

- Online media, broadcast radio and broadcast TV are clearly economic products that account for a huge amount of time.....but free media contribution to consumer welfare is not captured by final expenditure in GDP.
- New literature suggests that recent economic growth would be dramatically higher if BEA would include 'free'online media in measured GDP and total factor productivity (TFP) (Brynjolfsson and Oh 2012, Varian 2011, Ito 2013, Aeppel 2015).

Main contribution

- The authors (NSS) develop a method to capture free media's contribution to consumer welfare in a framework consistent with National Account principles (SNA, 2008).
- They identify **free media = advertising-supported media** that includes four categories for which they develop specific price indexes:
  - printed newspapers and magazines;
  - broadcast radio and television;
  - cable and other non-broadcast television and radio
  - online media.
- They thus recalculate US nominal and real GDP from 1929 to 2013 accounting for the welfare contribution of the above media categories.

Main contribution

Finally, the authors

- develop price indexes for advertising viewership
- recalculate productivity growth when free media are included as both final expenditures and business inputs.
- discuss Silicon Valley's Business Model of Ubiquity now, Revenue Later (URL)

The method

To evaluate the contribution of free media to GDP and productivity they assume that:

- the media company and the consumer engage in a barter transaction in which the consumer agrees to buy the TV content (computer, radio, newspaper) and watch (listen to, read) the advertisement in exchange. Thus most free media is just supported by paid advertising.
- there is a balancing whereby the income paid to the consumer is exactly equal to the consumption of the advertising (as in any barter transaction).
- the barter transaction is the same regardless of whether the media content is purchased from an outside company or produced in-house.

The method

They also assume that:

- the identity of the user determines the impact on GDP, thus
  - when consumers use **free media**, they call it entertainment and treat it as final expenditures.
  - when businesses use **free media**, they call it information and treat it as an intermediate input.

They estimate that free media added only **82 billion** to GDP in 2012. Time use based evaluations generate much higher estimates (Brynjolfsson and Oh 2012)

The Method and data sources

Expenditures on media content is estimated as:
(Media Content) = (Total Advertising Expenditures) - (Ad-Related Costs)

Main data sources are:

- The 2007 Economic Census is the primary data source (reports advertising by media category and industry) .
- Supplementary data is taken from the Service Annual Survey, the CS Ad expenditure dataset and other sources.
- Price indexes are based on BLS's PPI's, BEA's pre-existing price indexes and other sources.

The BEA's treatment of free media vs NSS approach

In **BEA's** GDP statistics, advertising-supported media is treated simply as an intermediate input to the production of advertising slots.

- The BEA's treatment does not imply any direct measurable benefit to the consumer of the entertainment provided, except to the extent that the consumer pays for the hardware and services associated with receiving the entertainment, such as the computer or internet service...but advertising-supported media provides a much greater value to the consumers than the costs of a TV set.
- Assume the soap being the advertised good, then a YouTube video produced to entertain households is an expense of the media company, which then sells the advertising slot to the soap manufacturer. Thus the cost of the advertising slot is an expense of the soap manufacturer just like physical inputs such as lye or fat.

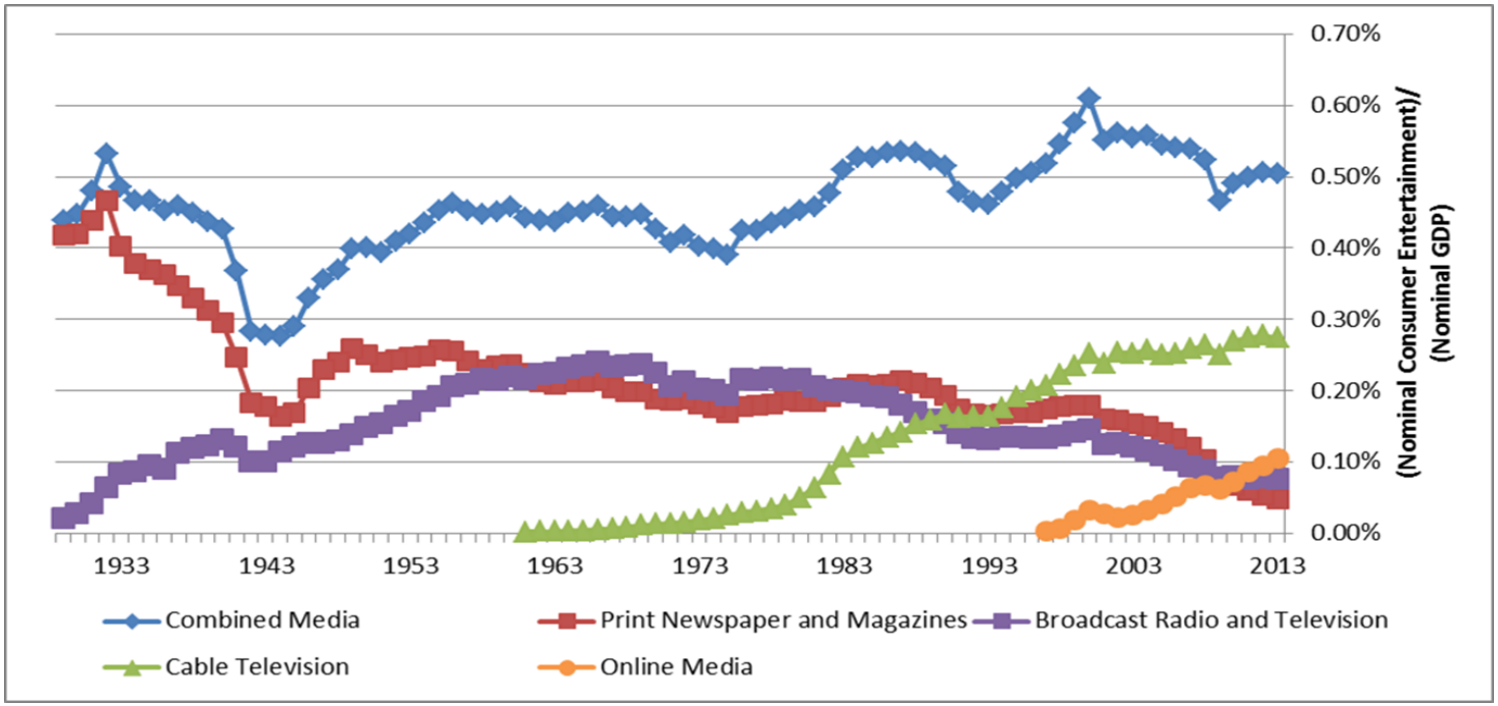
The BEA's treatment of free media vs NSS approach

The **NSS** Experimental approach:

- Estimation of the value of advertising-supported media based on actual cost of producing free media.
- The approach does not require any substantial conceptual change to the SNA since NSS treat advertising-supported media as a payment in-kind for services produced by households.
- The idea of treating advertising supported media as payment in kind is discussed in the literature since the 70's (Ruggles and Ruggles 1970, Okun 1971, Jaszi 1971, Juster 1973, Eisner 1978, and Kendrick 1979). And more recently Nakamura (2005), Soloveichik (2014) and Nakamura and Soloveichik (2015).

Nominal Free Consumer Entertainment

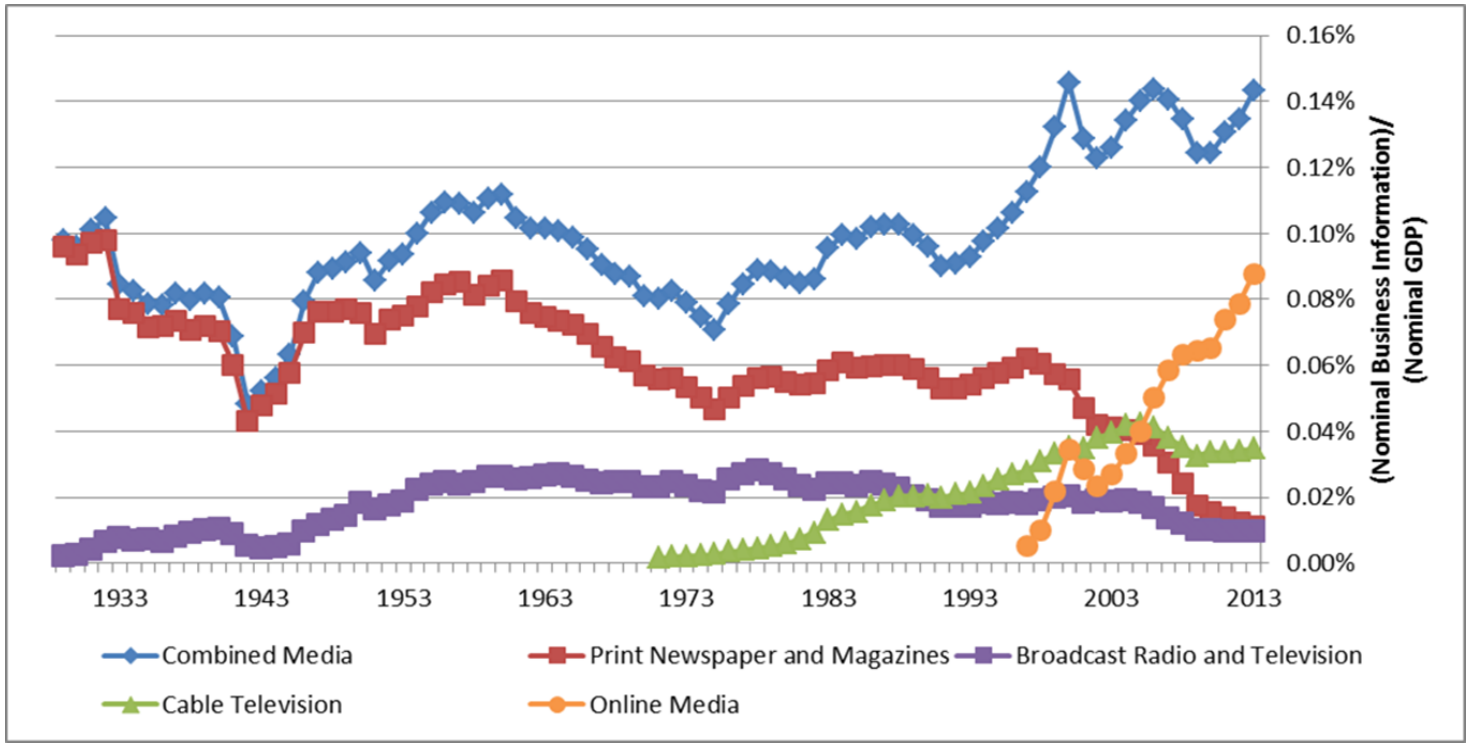
Nominal 'Free' Consumer Entertainment



- The explosion in online media is balanced out by drop in print media.
- Consumers have also substituted from broadcast television to cable television
- 'Free' consumer entertainment has hovered around 0.5% of nominal GDP – so the experimental methodology doesn't change nominal GDP growth much.

Nominal Free Business Information

Nominal 'Free' Business Information

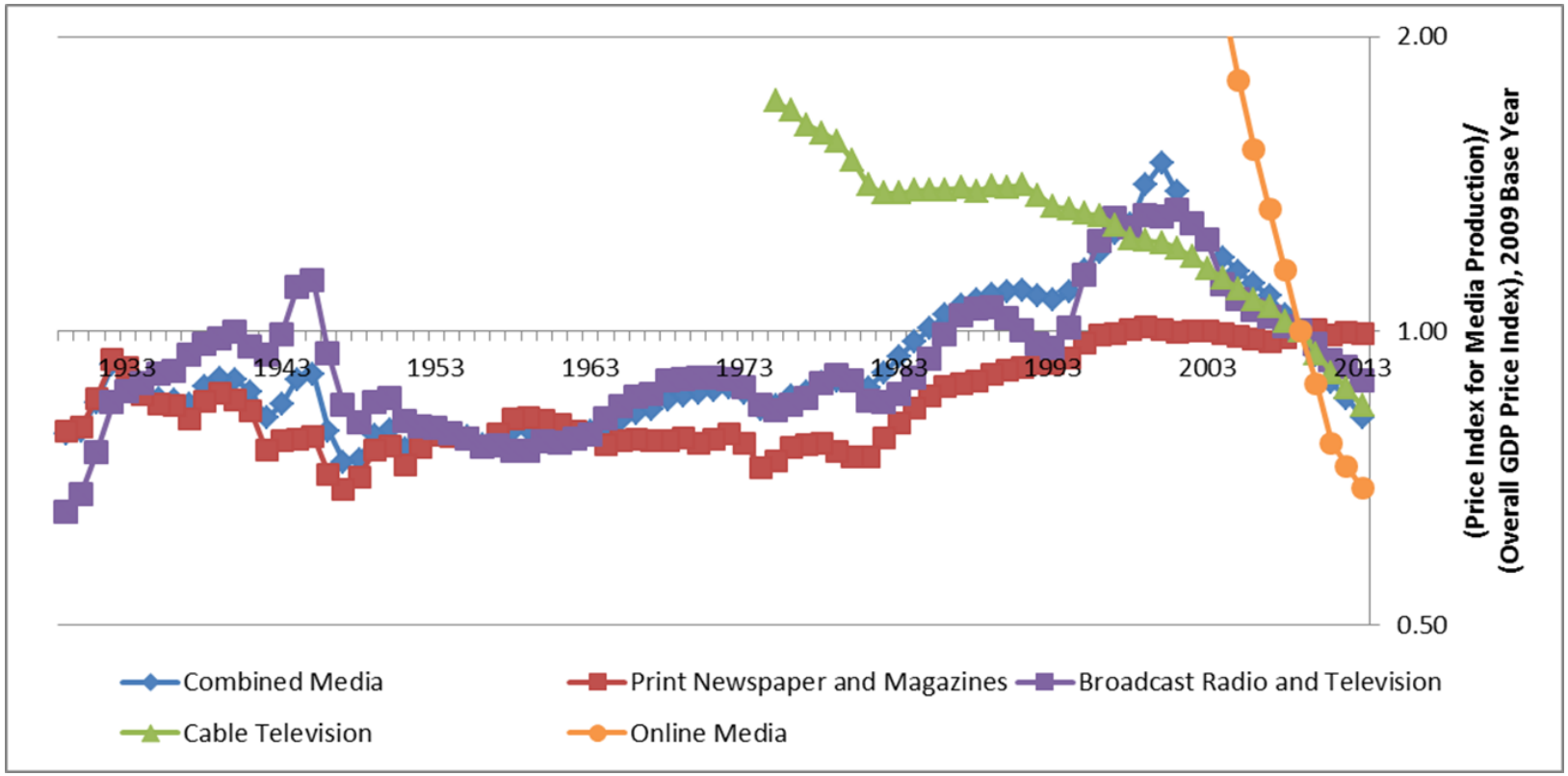


- Measured GDP only depends on final expenditures, so 'free' media used by businesses has no direct effect on GDP. But it does change measured productivity.
- Business use of 'free' media has increased – but it's still a very small share of inputs.
  - Purchased software, textbooks, consultants and other information sources are much larger.

Next step: build price indexes for Media and Advertising Viewership

- Media are very dynamic services so it is very difficult to track their production costs and consequently identify proper price indexes.
- Media is also a non rival good with poorly defined units of output.
- Data tracking advertising viewership prices directly are not available. Thus NSS calculate advertising viewership price indirectly.
- First, they estimate a quantity index for advertising viewership, then they divide nominal advertising revenue by the quantity index to get prices.

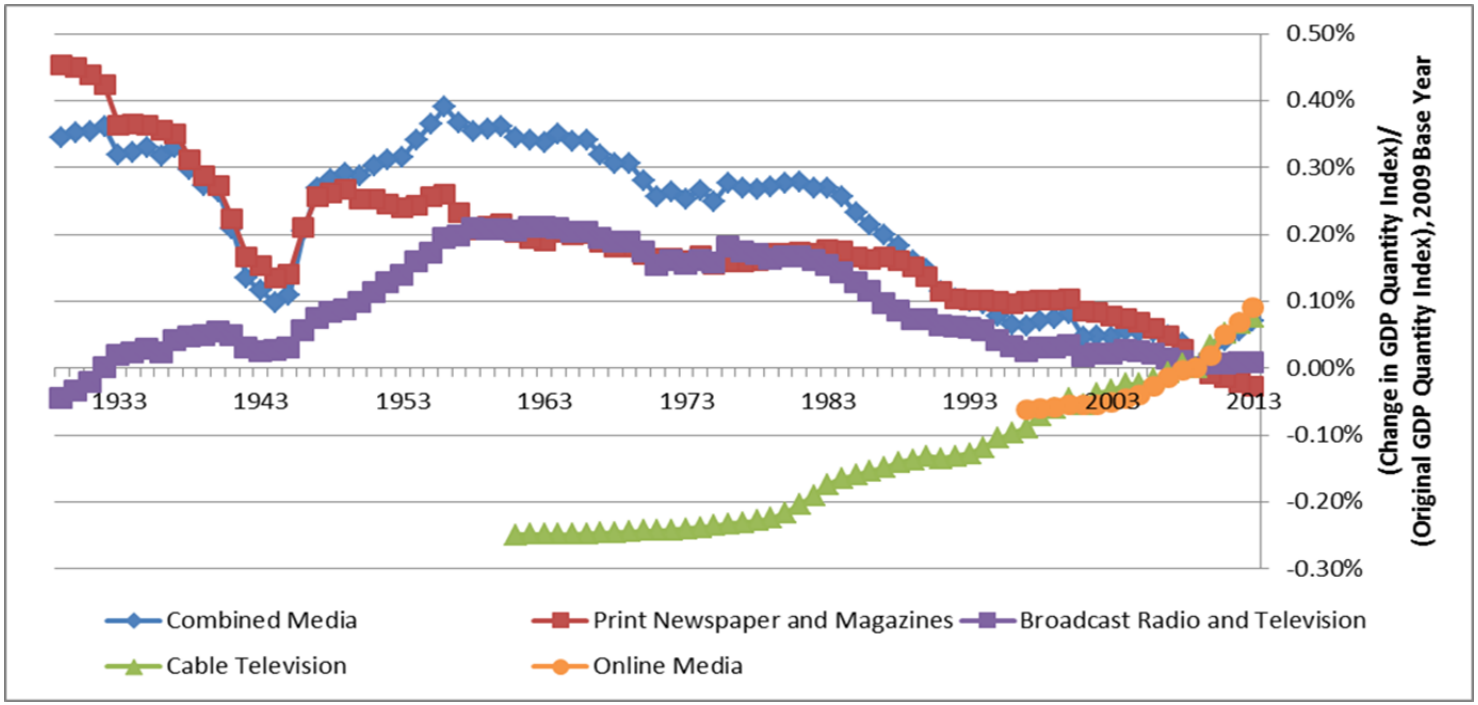
Prices for Free Media vs. GDP Prices



- Online media uses a lot of computers, so its production costs have dropped.
- Cable television also uses computers to film programs and then transmit them.
- In contrast, print media and broadcast media use less computers in production.

Empirical results

Preview of Results: Revisions to real GDP

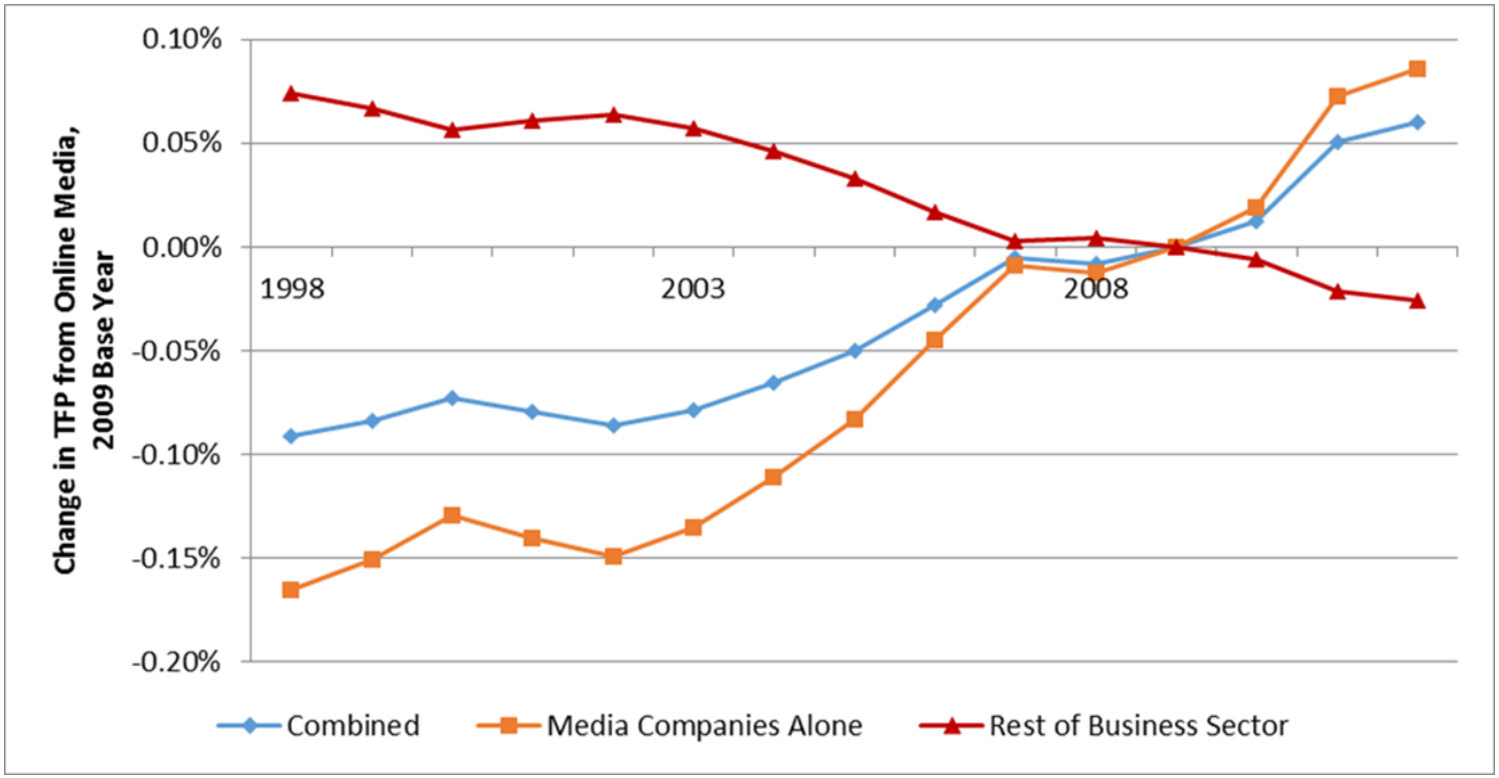


Free online media has been growing dramatically over the past decade, but print media has been falling. The net impact on real growth is small.

Recalculating the TFP

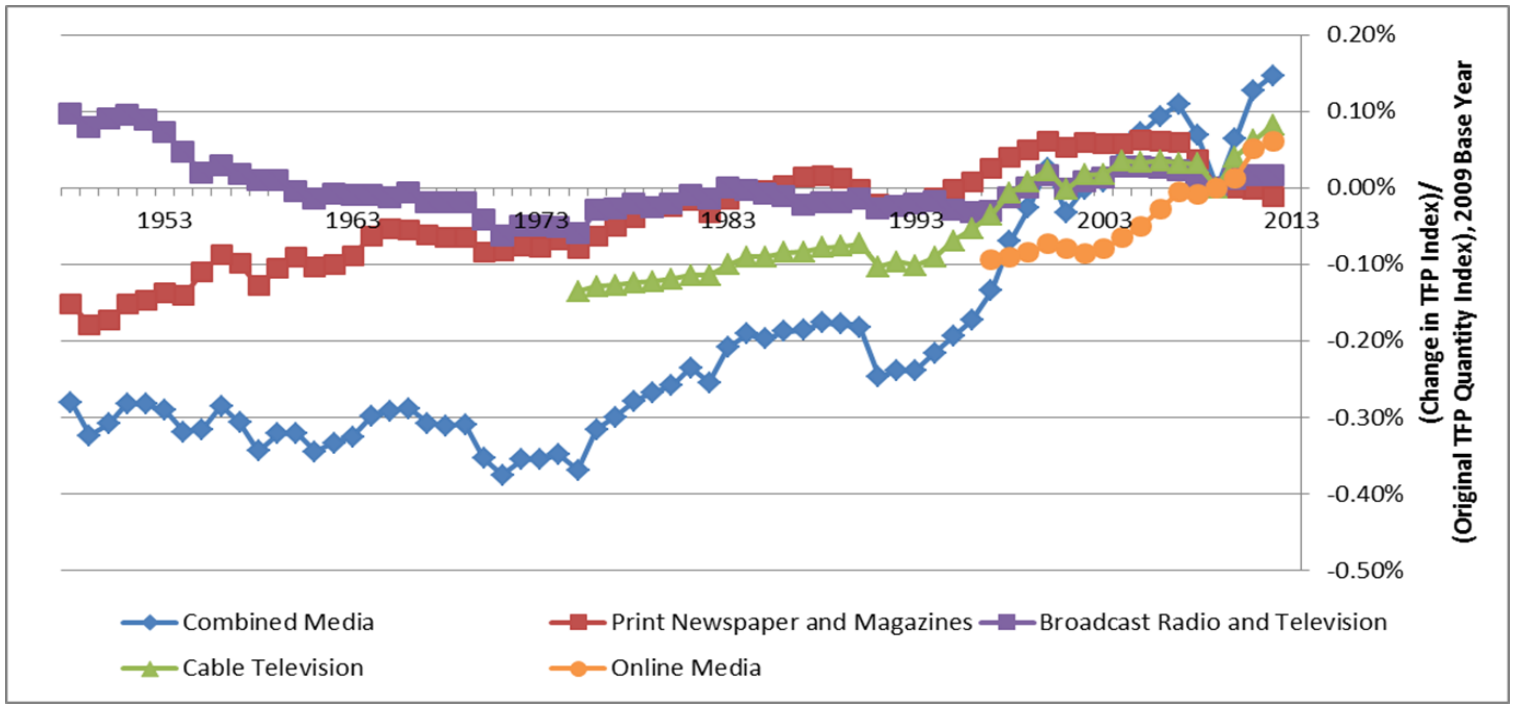
- To generate a new TFP, NSS added new output and new input for each industry.
  - Media companies produce free media and barter them for advertising viewership.
  - The household sector produces advertising viewership and barters it for free entertainment
  - Companies produce advertising viewership and barter it for free business information
- NSS calculated industry-level TFP for each of the 63 business sector industries tracked by BEA and BLS in their joint production accounts.
  - Historical data is taken from Jorgenson, Ho, Samuels (2015)
  - Aggregate TFP is obtained from industry measures weighted with gross output.

Change in Business Sector TFP with Online Media



- Consistent with previous research, measured TFP growth would be higher if 'free' online media was included in the I-O accounts.
- However, the increase in TFP growth is relatively small and not nearly enough to reverse the recent slowdown in productivity growth.

Revisions to Aggregate TFP



TFP is recalculated treating Advertising Viewership as an Input and 'Free' Media as an Output.
Aggregate TFP is not much affected, but industry productivity does.

Main findings

Research question: how to account for advertising-supported media?

- Internet is not the first media category to be subsidized by advertising and many of the measurement issues can be addressed by a simple tweak to the current GDP measurement methodology.
- NSS apply their method to recalculate GDP and its growth. They show that the inclusion of advertising supported media in current GDP has a minimal impact on measured GDP growth and TFP growth in the U.S..
- Nominal GDP growth falls by 0.005% per year, real GDP growth rises 0.009% and TFP growth rises by 0.016% per year.

Main comments and suggestions

- The paper provides an important contribution to the debate over the definition and measurement of economic statistics such as GDP.
- NSS effort raises fundamental issues for National Accounts and Policy Makers supporting the evidence that existing economic statistics are not fully capturing the scale of digital activity (Coyle, 2015).
  - Free media is a typical example of zero-priced-good that by the actual definition is not counted in GDP.
- Economic statistics are public goods essential for decision making in business and public policies (Bean, 2015) so it is crucial to keep the debate alive!

Main comments and suggestions

- Existing empirical evidence shows that the selection of the method to evaluate the contribution of free media to GDP makes a material difference (Brynjolfsson and Oh, 2012, Varian, 2009).
- NA consistent calculations generate little contributions to GDP growth while alternative methods very high growth contributions.
- Debated issue: Does the NA framework develop too slowly to capture the pace of change of modern economies?
- A more extended analysis of the linkages with the existing literature and the policy implications of the NSS method is suggested.

Specific remarks

- Deeper investigation of the role of online media as a driver of growth.
- Not very straightforward the inclusion of overhead costs as a main component of the media price index (flat over time).
- Discussion about the recalculation of TFP (industry and aggregate) might be extended and main results more deeply investigated to better clarify the role of media industry in the whole economy (spillovers).

Thank you