



WORKING PAPERS

RESEARCH DEPARTMENT

WORKING PAPER NO. 15-25
VALUING “FREE” MEDIA ACROSS COUNTRIES IN GDP

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July 2, 2015

RESEARCH DEPARTMENT, FEDERAL RESERVE BANK OF PHILADELPHIA

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Abstract

“Free” consumer entertainment and information from the Internet, largely supported by advertising revenues, has had a major impact on consumer behavior. Some economists believe that measured gross domestic product (GDP) growth since 2000 is too low because it excludes online entertainment (Brynjolfsson and Oh 2012; Ito 2013). Similar large effects on consumers occurred with the arrival of free radio and television entertainment. We provide an experimental methodology that uses previously established GDP measurement procedures to value advertising-supported entertainment around the world.

The experimental method raises global real GDP growth, but the increase is small. It is true that advertising-supported online entertainment has grown dramatically since 2000. Concurrently, advertising-supported print entertainment has been stagnant. The net impact is a real growth rate of 7.6% per year for advertising-supported entertainment. Furthermore, advertising-supported entertainment accounts for less than 0.5% of global GDP. As a result, our experimental methodology only raises overall real GDP growth by 0.019% per year.

Across countries, the experimental methodology raises nominal inequality. In 2011, nominal GDP for nations in the Organisation for Economic Co-operation and Development (OECD) increased by 0.18% more than nominal GDP in the rest of the world. Furthermore, nominal GDP in the United States increased 0.22% more than GDP in the rest of the OECD countries. However, prices for advertising-supported entertainment are also higher in wealthier nations. The net impact is a small reduction in real inequality.

Keywords: advertising, entertainment, Internet, intangible, measurement

JEL Codes: E01, L82, M37

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Introduction

Stiglitz, Sen, and Fitoussi (2009) argued that measured GDP is not a perfect proxy for welfare. One frequently discussed source of consumer welfare is free media. Facebook contributes directly to consumer welfare, but that contribution is not currently captured in the final expenditure part of GDP. We outline an experimental methodology to capture Facebook's contribution to consumer welfare while staying within the framework established by the official guideline for national accounting, the System of National Accounts 2008 (SNA 2008). As with owner-occupied housing, we impute production and consumption even though no money changes hands.

We impute a barter transaction between consumers and media companies: Consumers watch ads in return for free entertainment. Our experimental methodology has at its heart two balancing components. On the expenditure side, we impute personal consumption expenditures equal to the cost of providing the entertainment programs. These costs are paid by advertisers so free entertainment is actually advertising-supported entertainment. The entertainment services of advertising-supported media could have been supplied through nonadvertising-supported media, and, indeed, they can be thought of as having been bid away from alternatives. *Seinfeld* can appear on advertising-supported broadcast television or subscriber-supported cable television.

On the income side, we impute payments to households that are, in effect, paid to view advertising, with those payments being equal to the cost of providing entertainment programs. Businesses may also use advertising-supported media such as professional journals. In that case, we impute a barter transaction between the business and advertiser.

We also construct an original time series of free media around the world back to 1980. We purchased data from the World Advertising Research Center (WARC), which gives advertising expenditures by country, year, and media category. We use the WARC data to estimate the nominal value of advertising-supported entertainment worldwide. We then used prices from the International Comparison Program and other sources to calculate the real value of advertising-supported media around the world.

Not all countries benefit equally from advertising-supported media. Content can be transmitted easily, but differences in language, market, and culture influence the final impact. On average, wealthier countries devote a higher proportion of their nominal GDP to advertising-supported entertainment. Furthermore, the United States has more advertising-supported media than any other major country. As a result, our experimental methodology increases nominal inequality across countries.

Our paper will be divided into four parts. Section 1 provides a theoretical discussion of advertising-supported media. We start by describing SNA's current methodology for handling advertising-supported media in GDP. We then describe our experimental methodology in more detail and show that the experimental methodology produces better welfare comparisons. Section 2 collects data on advertising expenditures worldwide and recalculates nominal GDP by country from 1980 to 2012 using the experimental methodology. Section 3 introduces our price indexes for advertising-supported media worldwide. We then use those price indexes to calculate real GDP by country from 1980 to 2012 using the experimental methodology. Finally, Section 4 discusses our results for online media in more detail.

Section 1. Conceptual Discussion of Advertising-Supported Media

Current Treatment of Advertising-Supported Media in SNA 2008 and the U.S. National Income Accounts

In the SNA 2008 and the U.S. Bureau of Economic Analysis (BEA) National Income Accounts, advertising-supported media is treated simply as a marketing expense, and, as such, it is considered an intermediate expense in the production of the good being advertised. If we think of soap as being the advertised good, then a soap opera produced to entertain households is seen as an expense of the soap manufacturer such as lye or fat. In this treatment, there is no consumption 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 television set or cable service.

The difficulty with that treatment is advertising-supported media provides a much greater value to consumers than the cost of a television set. Because advertising-supported media provides so much value to consumers, it seems wrong not to count it in the final output. This difficulty is highlighted when television or the Internet bids entertainment or content providers, such as Jerry Seinfeld or Tina Fey, away from the paid entertainment sector into advertising-supported media. Under the current treatment, these entertainers cease to be providing consumer recreational services and become advertising instead. A consequence is that in the 1950s, for example, real consumer recreational services declined in a period in which real personal consumption per capita rose substantially because households switched from movies to television as their prime source of entertainment.

It is useful to clarify the conundrum with the following highly stylized model. We consider a soap manufacturer, an entertainer, and households. The soap manufacturer must advertise to sell the soap. Initially, the soap manufacturer spends \$1,000 to make the soap, spends \$1,000 on advertising with no entertainment value, and sells 1,000 bars of soap for \$2 each. The entertainer sells tickets to her act for \$1 each. One thousand households each spend \$2 for soap and \$1 for entertainment. Now, suppose the soap manufacturer hires the entertainer for \$1,000. The entertainer acts for free but includes a soap announcement. The 1,000 households receive the soap and the entertainment but pay only \$2 each (and listen to a soap announcement). For simplicity, we assume that the demand for entertainment is unaffected by this switch. In other words, households act as if they were paying \$1 for the entertainment, but instead, they are viewing the advertising and they appear to perceive that viewing the advertising costs them \$1 each. Roughly speaking, the households consume the same amount but pay less out of pocket.

In the current national income accounts treatment, output drops. The entertainment is no longer measured as part of personal consumption, only the soap is. In the initial case, \$3,000 in economic resources was used to produce \$3,000 in consumption output. With advertising-supported entertainment, \$2,000 is used to produce \$2,000 in consumption output. Effectively, \$1,000 has disappeared from real output. However, this appears to be a misrepresentation in that the households are still consuming the same real amount of entertainment, but it has disappeared from measured output.

One possible treatment would be to view the entertainment with advertising as having the same real value but falling in price to zero. That is, nominal output is \$2,000, but real output is \$3,000. While we do not actually observe the market value to the consumer of the entertainment in most cases, we can

impute the market value from the payment to the entertainer. But zero prices are uncomfortable within the national accounts. For example, it is difficult to explain why consumers sometimes pay to avoid advertising if the price for advertising-supported media is zero. Furthermore, if the situation should reverse and a price be paid, the rate of inflation for that item cannot be calculated.

A more satisfactory treatment, first proposed by Cremeans (1980), would be to consider the entertainment to be paid by the consumer with a barter trade of entertainment received by the consumer in exchange for which the consumer agrees to listen to the advertisement. We would record a dollar as paid by the consumer to the soap manufacturer for the entertainment, and the soap manufacturer would pay it back to the consumer for listening to the advertisement. In this view, advertising-supported media increases the real income and consumption of the consumer. This reflects the true value of entertainment to modern society and in a way that finds parallels with the treatment of similar products of zero price, such as residential services of owner occupied dwellings and financial services of checking accounts.

What Media Are Tracked in This Paper?

Advertising-supported media include products such as newspapers and services such as broadcast television.¹ This paper studies only advertising-supported formats that provide valuable media services to consumers to compensate for their time. Telemarketing calls, spam e-mail, and other unwanted media are excluded from our research. Some media categories receive all of their revenue from advertisers, and consumers pay nothing out of pocket. Other media categories receive some of their revenue from advertisers and some from consumers. None of the economics in this paper depends on whether consumers pay a positive amount out of pocket. It only matters that consumers pay less than the production cost of advertising-supported media. In most countries, television is the largest advertising-supported media category, followed by print media. But Internet advertising is growing rapidly and may soon overtake print media.

Under the experimental methodology, there are two types of output: consumer entertainment and advertising viewership. Consumers produce advertising viewership and then barter it to media companies in return for entertainment. The tradeoff is clearest for downloaded apps. Software developers often produce two different versions of the same program: one for a small monetary payment and the other with ads. But consumers can also avoid ads by reading books instead of magazines, buying DVDs instead of watching television, etc. The supplier of the media also sells advertisers access to customers, which is the standard monetary transaction that is already reflected in the SNA. There is no change in the value added or in operating surplus for the media producer because the value of the newly recognized media output equals the service provided by the households. However, we now recognize the household as producing a service for the advertiser by agreeing to watch (or at least be exposed to) advertisements in exchange for the free media service provided by the media producer. We are treating this implicit sale of media as household final consumption expenditure.

¹ Our discussion assumes that media companies earn money by selling advertising services to outside companies, but the economics are the same if media companies collect and sell private information for nonadvertising purposes. We just use the word “advertising” because it would be too cumbersome to say “advertising or information collection.”

Previous Research on Noncash Payments in GDP

Our experimental methodology does not require any major conceptual changes to SNA. In this paper, we treat advertising-supported media as a payment in-kind for services produced by households. SNA 2008 already counts other noncash payments as labor income (Section 7.51). SNA also imputes cash values for barter transactions (Section 3.75), owner-occupied housing (Section 6.34), and financial services indirectly measured (Section 6.163). Just as with those transactions, we impute a value for advertising-supported media based on estimated costs. However, since the household is not “employed” by the media producer, we treat the household production of the service of providing access to advertising as a form of production by an unincorporated household enterprise.

Our paper is not the first to discuss treating advertising supported media as payment in-kind. Imputation for advertising-supported media was first raised in *The National Income – 1954 Edition* and was extensively discussed in the 1970’s (Ruggles and Ruggles 1970, Okun 1971, Jaszi 1971, Juster 1973, Eisner 1978, and Kendrick 1979). The paper “Consumer Services Provided by Business Through Advertising-Supported Media in the United States” (Cremeans 1980) estimated that advertising-supported media was worth \$28 billion in 1976.² Vanoli discusses this issue in *A History of National Accounting* (2005), and Nakamura studied advertising-supported entertainment in “Advertising, Intangible Assets, and Unpriced Entertainment” (2005). More recently, *Businessweek* published an article last year criticizing the BEA’s GDP numbers for excluding free online media (Ito 2013).³

Our paper extends this earlier research in two important ways. First, we calculate the value of advertising-supported media around the world. This allows us to compare “free” media in the United States with “free” media in other countries. In addition, we decompose real entertainment expenditures into hours of advertising viewership provided and “earnings” per hour of advertising viewership. This decomposition has no effect on measured GDP, but it does have implications for hourly earnings growth and productivity growth over time and across countries.

Other Research on Entertainment and Brand Equity in GDP

Advertising-supported media is distinct from entertainment originals. Entertainment originals are long-lived intangible assets owned by media companies and artists. It is true that entertainment originals are sometimes used to produce advertising-supported media such as broadcast television. However, the categories are not at all identical. Advertising-supported media includes short-lived media such as newspapers, sports broadcasting, and other entertainment that is not part of capital stock. Conversely, entertainment originals are used to produce consumer products such as DVDs or books that are sold to consumers and counted in personal consumption expenditures. This paper uses some of the data originally collected for a project on entertainment originals (Soloveichik 2013a, b, c, d, and e), but none of the results in this paper depend on the treatment of entertainment originals in GDP.

Advertising-supported media is also distinct from capitalized brand awareness. Previous papers have argued that advertising increases sales over the long run, and therefore, they should be considered an

² For the same year, we estimate that advertising-supported entertainment added \$9.2 billion to GDP. The main reason for the difference is how we handle nonmedia costs such as advertising agency markups. We consider those nonmedia costs to be intermediate expenses and, therefore, do not count them as media services provided to consumers. We also exclude media costs for business publications.

³ Some websites are purely amateur productions with no subscription revenue or advertising revenue. Our paper will not capture them, but they account for only a small fraction of time spent online.

investment in brand equity (Nakamura 2005; Corrado, Hulten, and Sichel 2009). However, that discussion focuses on the businesses that purchase advertising services from media companies. Once again, the two categories are not identical. Capitalized brand awareness includes telemarketing calls, spam e-mails, and other advertising that do not provide any entertainment to consumers. Conversely, advertising-supported media includes short-term campaigns to increase sales, which have no long-term effect on brand awareness. None of the results in this paper depend on the treatment of brand equity in GDP.

Theoretical Effects on Measured Consumer Welfare

Our experimental method produces more robust treatment of public broadcasters. SNA's current method counts programs that are broadcast by governments or nonprofits in final expenditures. But advertising-supported programs are considered an intermediate expense and are excluded from GDP. In some cases, the line between advertising-supported media and nonprofit-supported media is very thin. For example, companies often sponsor PBS television programs and are thanked on air. Should those sponsorships be counted as advertising and excluded from final expenditures, or as donations to nonprofits and included in final expenditures (SNA A4.16)? Under SNA's current methodology, measured GDP depends on the exact classification. But our methodology is robust to classification changes.⁴

Our experimental methodology produces more intuitive welfare comparisons. In the United States, many sporting events are now moving from broadcast television to cable television. Cable television networks generally show the same amount of advertising as broadcast networks, so consumers are unambiguously worse off from the switch. They are now required to pay subscription fees to get content they had previously viewed for free. Yet, SNA's current methodology treats the new cable subscribers as a real GDP increase.⁵ Under the alternative method, real GDP falls if some viewers choose to miss the sporting event rather than pay cable subscription fees. This drop in viewership is considered a decrease in final expenditures. Nominal GDP does rise with the switch from broadcast television to cable television. However, that nominal GDP growth is more than canceled by higher prices for entertainment caused by the switch. On the other hand, note that with entry into these markets, the higher earnings of the switch of sporting events from broadcast television to cable television may well result in more sporting events becoming available in more markets as well as in higher salaries to players, inducing higher-value workers to enter the competition and improving the quality of the entertainment.

Conversely, some recent media trends help consumers. Consider the case of a company that switches from telemarketing to online advertising. Holding advertising expenditures constant, almost everyone prefers online media to telemarketing. Consumers are clearly better off getting valuable services such as social media or search engines rather than just dinner interruptions. Yet, SNA's current methodology shows no change to measured GDP from the switch to online advertising. In contrast, we assume that telemarketing companies provide very little value to consumers for listening to their ads, and

⁴ Under the experimental methodology, the treatment still changes industry accounts. If sponsorships are considered advertising, then they are an intermediate expense for companies and "income" for consumers. If sponsorships are considered donations, then they are neither. But aggregate GDP is the same regardless.

⁵ This is assuming that the larger viewership for cable sports is counted as a quantity increase. In practice, the U.S. Bureau of Labor Statistics' (BLS) current price index for cable television does not adjust for programming quality improvements. BEA uses the BLS's price index to deflate consumer expenditures on cable, so measured output is basically the number of subscribers.

online media companies provide much more value. Therefore, a switch from telemarketing to online media increases the quantity of “free” media and unambiguously increases measured GDP.

One might argue that advertising-supported media is an intermediate input embedded in final output, and therefore, our experimental methodology double-counts advertising-supported media. However, that argument assumes that consumers can’t watch advertising-supported media without buying the products. From a legal standpoint, that’s not true. Advertising-supported media is available to everyone without any purchase requirements. The market price for advertised products only covers the products themselves, not the shows on which they’re advertised.

Other Changes to National Accounting and Labor Productivity

Our experimental methodology has no impact on savings, corporate profits, or the statistical discrepancy. By construction, the nominal income “earned” by consumers watching advertising is equal to the nominal value of entertainment “purchased.” If the media provider is located in the same country as the viewer, imports and exports will be unaffected. If the media company is located in a different country, imports and exports will increase by the same amount with no effect on the net nominal balance of trade.

Consumers often need to buy expensive equipment before they can enjoy advertising-supported entertainment. SNA 2008 currently counts televisions, radios, smartphones, and computers as consumer durable goods. However, one could argue that those consumer durables should be reclassified as private business investment if advertising-supported media is considered an in-kind payment for advertising viewership. This change would have no impact on measured GDP, but it would increase capital stock and decrease the stock of consumer durables. In that case, the value of advertising-supported media would be considered mixed income and represents compensation for time spent watching advertising as well as the capital necessary to watch advertising. If SNA 2008 chose to implement our experimental methodology, the value of advertising-supported entertainment would be added to “proprietor’s income” (or “mixed income” in SNA terminology) (NIPA Table 1.10, line 13).

As with all labor inputs, the quantity of advertising viewership has no direct effect on measured GDP. Nevertheless, advertising viewership quantities are interesting for other economic research. We can define real earnings as the quantity of real advertising-supported entertainment provided for a fixed amount of advertising viewership. For example, suppose that a television broadcaster doubles the number of advertising slots sold without improving program quality at all. This represents a 50% cut in the real earnings for advertising viewership. Conversely, the same television broadcaster could cut the program quality by 50% without changing the number of ads. This also represents a 50% cut in earnings for advertising viewership. Measured productivity also depends on both the value of advertising-supported media earned by viewers and the quantity of advertising viewership provided. We have not been able to find reliable data on advertising quantities across countries or time. We welcome suggestions on how to measure real earnings for advertising viewership across countries or over time.

Section 2. Nominal Expenditures on Advertising-Supported Media

Which Media Categories Are Included?

We study four separate media categories: (1) print newspapers and magazines;⁶ (2) radio; (3) television (broadcast and advertising supported cable television); and (4) online advertising. In some cases, the line between one category and the next is speculative. In particular, many websites contain material originally produced for another media category. Our estimates of nominal media production are not sensitive to the split between the categories. However, each category has its own price index, so real growth rates may change if the split changes.

Not all of advertising-supported media is considered to be final expenditures under our experimental method. We count popular magazines, leisure websites, and other consumer media in final expenditures. Throughout the paper, we will call consumer media “entertainment.” But professional magazines or productivity software are considered an intermediate input. For example, a physician might get free medical journals in return for reading pharmaceutical ads, but this we view as part of work, not personal consumption. We estimate that consumer entertainment accounted for more than 90% of advertising-supported media in 2011, so we will focus our discussion on entertainment. We include consumer information, such as Google, in entertainment. Note that information provided to consumers may enhance the value of consumption. For example, information garnered from TripAdvisor may enable consumers to pick hotels better suited to their preferences, raising their utility from consumption of leisure services (Stigler and Becker 1977; Nakamura, 2014).

Data Sources

Our main data set was purchased from the World Advertising Research Center (WARC). WARC tracks advertising by media category for 82 countries from 1980 to 2011. WARC’s data coverage is better for recent years, larger countries, and wealthier countries. In the time series analysis, we will focus on the few very wealthy countries that have data dating back to 1980. However, our cross-country comparisons will focus on recent years in which WARC had a more comprehensive data set. In our discussion, we may also impute advertising for countries not in the WARC data to get global advertising expenditures.

We supplemented the WARC advertising data with a variety of data sets. Yearbooks from the European Audiovisual Observatory and other public reports provide public media funding. IMDb.com provides information on television program characteristics. The World Bank provides GDP, education, government quality, health outcomes, and other background variables. Finally, we drew on our earlier papers for background information on the media industry.

⁶ WARC’s data do not include own-account media such as recipe books published by food companies. We believe this type of own-account media is very small and does not bias our results.

Advertising Relative to GDP Around the World

Figure 1 shows advertising expenditures by media type relative to global GDP.⁷ Since 2000, online advertising has risen from 0.03% to 0.17% of global GDP. Over the same time period, print advertising has decreased from 0.45% of nominal GDP in 2000 to only 0.16% in 2013. These two trends are almost certainly related. Newspaper classified advertising has moved from newspaper sections to websites. Printed newspapers are being replaced by blogs and Twitter. In an earlier paper studying the United States, we found a similar drop in print advertising when television was introduced (Soloveichik 2014).

Not all of the advertising revenue shown in Figure 1 is used to produce entertainment. Media companies need a sales staff to reach out to advertisers, plan the exact format of the ads, and bill the advertisers afterward. Reporters and editors may focus on topics useful for advertisers rather than for readers.⁸ In addition, printed media such as newspapers spend money printing ads and then stuffing them into news sections. In earlier research, we estimated that nonmedia costs account for 50% of newspaper advertising, 72% of magazine advertising (Nakamura 2005), and 25% of television, radio, and online advertising (Soloveichik 2014, Soloveichik and Wasshausen 2013, and Soloveichik 2013 a, b, c, d, and e).⁹

We could not find any global data on the split between media consumption for work purposes and media consumption for leisure. We estimate that 99% of television and radio broadcast programs are used for leisure, 90% of newspaper articles, 85% of magazine articles, and 75% of online material. These numbers are rough guesses based on the type of material shown in each media category and the likely users. We welcome suggestions to improve our numbers.¹⁰

We present our results in Tables 1 to 4. Table 1 shows our estimates of nominal entertainment supported by advertising relative to nominal GDP for 2010 for a broad cross-section of countries. Table 2 presents our cross-country data for 1980; since data are far sparser as we go back in time, Table 2 contains many fewer countries than Table 1. Table 3 shows our estimates of nominal entertainment supported by advertising relative to GDP for the United States from 1980 to 2013. Table 4 shows our estimates of nominal entertainment supported by advertising for the entire global economy; our imputations are relatively large in the earlier years but are generally below 5 % of the total after 1995.

Figure 2 shows advertising-supported entertainment relative to global GDP. Taken individually, the growth rates for each media category are virtually identical to the growth rates in Figure 1. However, total advertising-supported entertainment in Figure 2 shrank 0.6% slower per year than total advertising expenditures in Figure 1. The reason for this difference is that print newspapers spend more than twice as much on nonmedia costs as online companies do. The shift from print journalism to web journalism is likely to be painful for reporters, but it is much worse for printing press manufacturers and newspaper delivery people.

⁷ We impute advertising-supported media for countries and categories with missing data. WARC's data have become more comprehensive over time, so our imputations shrank from 15% of advertising in 1980 to 2% in 2011. Results are similar if we restrict the sample to countries with data starting in 1980.

⁸ Some media outlets have procedures to prevent journalists from collaborating too closely with advertisers.

⁹ Those earlier papers were focused on the United States, but the basic technology for producing media is similar around the world. Therefore, it is likely that the nonmedia cost share is similar.

¹⁰ One might argue that data on which the media is consumed might be informative. However, many workers view leisure media during work breaks. Conversely, many workers read professional journals at home.

Advertising-Supported Entertainment Relative to GDP by Country

Figure 3, 4, 5, and 6 graph advertising-supported entertainment against nominal GDP per capita in 1980, 1990, 2000, and 2010. On average, wealthier countries devote a higher share of nominal GDP to advertising-supported entertainment. Therefore, our experimental methodology raises nominal inequality across countries. However, the effect of wealth has been shrinking over time. On average, a 10% increase in GDP per capita raised advertising-supported entertainment by 16.3% in 1980, 4.5% in 1990, 3.1% in 2000, and 2.3% in 2010.¹¹ As a result, our experimental methodology slightly decreases the growth rate for nominal equality.

Figure 7 compares nominal advertising-supported entertainment by country over time. We find that total advertising-supported entertainment is very steady over time. In other words, countries with large advertising sectors in 1980 tend to have large advertising sectors in 2013. Because advertising-supported media is so steady over time, panel regressions with country-fixed effects tend to produce volatile estimates. Most of our empirical analysis will focus on cross-country comparisons from 2005 to 2010. To reduce volatility, we average variables of interest over those six years. Results are qualitatively similar if we look at other years, but our sample is smaller. Those results are available upon request. All of the graphs we present here are simple correlations. We have not been able to test for causality.

The observed positive correlation between nominal GDP and the income share for advertising-supported entertainment does not prove that advertising-supported entertainment is a luxury good. On average, wealthier countries tend to have more education and better government. These factors may be independently associated with supply and demand of advertising-supported entertainment. Furthermore, advertising-supported entertainment is not correlated with GDP over time. Figure 2 shows that nominal GDP share for advertising-supported entertainment was almost constant from 1980 to 2013, even as real global GDP per capita rose almost 50%.

Figure 8 graphs advertising-supported media against English language. Among developed countries,¹² the United States has the most advertising-supported media by far. Furthermore, other English-speaking countries generally have more advertising than the rest of the developed world does. The correlation between advertising-supported media and English language is statistically significant and remains significant even if we remove the United States from the regression. We do not know why this relationship exists. Television shows and movies are frequently traded across countries, so exports from the United States might explain some of the extra broadcast advertising in the rest of the English-speaking world. However, English-speaking countries also have more advertising-supported newspapers and magazines than the rest of the world does. Those media products are generally produced and sold locally, so exports from the United States are not relevant. Perhaps the advantage for English-speaking countries is caused by cultural and legal factors inherited from centuries ago.

Figures 9 and 10 show that public broadcasting is negatively correlated with advertising-supported broadcasting and positively correlated with advertising-supported print media. If we focused on broadcasting alone, there would appear to be significant crowd-out from public broadcasting to private broadcasting. However, advertisers appear to compensate by substituting print advertising when broadcast

¹¹ For these graphs, we drop countries without any data. As a result, our sample becomes larger and more representative over time. Qualitative results are similar if we track a fixed sample of countries or impute data for missing countries.

¹² We restrict the sample to countries that entered the OECD before 1980. These countries are generally wealthy.

advertising is not available.¹³ The net impact of public broadcasting on total advertising-supported media is very small. This substitution story is consistent with the long-run trends shown in Figure 2. Since 2000, the total GDP share for advertising-supported entertainment has been relatively flat. But the GDP share for print media has fallen steadily with the rise of online media.

Figure 11 graphs advertising-supported media against personal consumption expenditures. Holding GDP fixed, countries that spend a higher percentage on personal consumption have more advertising-supported media. Unlike the results previously shown, this correlation remains similar in a panel regression when we include country-fixed effects and year-fixed effects. This result could be taken as evidence that advertising determines consumer savings rates. However, it is more likely that changes in consumer savings rates drive advertising.

Section 3. Price Indexes and Real Entertainment Across Countries

Advertising-supported media is a difficult item to deflate properly. One particular issue is that the quality of the consumer durable goods used in the home production and the creation of the entertainment services has risen dramatically. For example, the quality of Google searches is enhanced by improvements in the cloud hardware and software employed by Google in conducting the searches as well as by the growing availability of websites to be searched. Similarly, high-definition televisions (HDTVs) and monitors enhance the quality of videos and television programs being watched and, indeed, the videos have higher production values to take advantage of the improved receiver quality. We will use our best judgment to produce reasonable price indexes across countries. These price indexes may not be perfectly accurate, but they can still shed light on general trends.

We use a two-step process to estimate media prices by country and time. First, we estimate costs for each media type in the United States from 1980 to 2013. For the United States, we use a combination of input prices and output prices for similar products to construct our media price indexes. Next, we estimate the *relative* price for each media type by country. We can then multiply to get prices by media type and country from 1980 to 2013. This two-step process is not ideal as it assumes that prices around the world will move with U.S. prices. While this may be true in the long run, it is unlikely to be true in the short run. We wanted to get data on input prices and output prices for similar products by country but were unable to locate that data. We welcome suggestions to improve our cross-country price indexes.

Media Prices in the United States

We start by constructing a price index for online media. The three main inputs to online media are software, computers to run the software, and everything else. For example, search engines start out with complex algorithms to optimize the search process. They then run those algorithms on server farms every time someone enters a query. In addition to those direct costs, online media companies also have overhead costs such as salespeople, utilities, and rent. We were unable to find price indexes specific to the software used by online media companies, the computers used to process requests, or their overhead costs. Instead, we use the BEA's price indexes for prepackaged software (Table 5.6.4, line 3) and the

¹³ Of course, correlation does not prove causality. It is possible that countries with a higher demand for broadcast advertising choose a lower public broadcasting budget in response, or both variables could be influenced by pre-existing cultural or economic differences.

BEA's price index for computers purchased by private businesses (Table 5.3.4, line 11) and personal consumption services (Table 1.1.4, line 6).

Figure 12 shows the combined price index for online media together with the individual component prices.¹⁴ We find that online media prices have fallen approximately 5% per year. Most of this decline is due to plummeting computer prices; the small price declines for software mostly cancel out the small price increases for overhead. At first glance, our price index appears to assume zero productivity growth in the online media industry. In fact, we assume that modern computer programmers are much more productive at writing software than they were in 1995. This rising productivity has allowed prepackaged software prices to fall 4% annually even as programmer wages rose. We assume that programmers producing own-account software for online media companies have enjoyed similar productivity gains as programmers producing prepackaged software, and therefore output prices for own-account software track output prices for prepackaged software.

Next, we construct a price index for newspapers and magazines. Book publishers produce a very similar product to newspapers, and therefore, wholesale book prices are a good proxy for the costs of writing, editing, printing, and delivering newspapers. We use the BEA's price index for book originals (Table 5.6.4, line 25) as a proxy for all those costs. As with consumer software, this is an output price and therefore includes some productivity growth over time. However, newspapers and magazines generally require much more outside research than books do. We were not able to find any data specific to journalist research costs, but we believe that those costs are related to communication technology. Before 1995, journalists did most of their research over the phone, so phone costs are a good proxy for research costs. Over the past few decades, journalists have been gradually shifting to online research, and therefore, the online media price index developed in Figure 11 is a good proxy for research costs.

Figure 13 shows the combined price index for print media together with the individual component prices.¹⁵ Unlike online media, newspaper prices have been rising steadily over time. It is true that cell phones and search engines make reporting much easier and more efficient. However, the basic job of writing and then editing a story has not changed much. Therefore, newspaper costs will rise much faster than online media costs. This divergence between newspaper costs and online media costs exacerbates inequality within the United States. Computer-proficient people have enjoyed much higher labor income growth over the past few decades, and they also benefit from cheaper advertising-supported media.

Finally, we construct a price index for television and radio. The main cost for broadcasters is programs to show. We use the BEA's pre-existing price index for long-lived television programs (BEA Table 5.6.4, line 24) as a price index for nonsports shows and the BEA's price index for sports tickets as a price index for sports programming (BEA Table 2.4.4U, line 209). Unlike other media types, television program quality also depends on the quality of the television set. Therefore, our combined price index will include quality-adjusted television set prices (BEA Table 2.4.4U, line 39) as one component. We do not have much data on costs for radio programs or radio sets over time. For simplicity, we assume that advertising-supported radio costs track advertising-supported television costs.

Figure 14 shows the combined price index for broadcast media together with the individual component prices.¹⁶ We find that advertising-supported broadcasting prices have been almost flat since 1990. This price growth is midway between the price declines in Figure 9 and the price increases in Figure 10. The last three columns in Table 3 present media prices for the United States, relative to 2009.

¹⁴ Our combined price index is a simple geometric mean with equal weights for each component. The combined price index is very sensitive to the weights assigned to each component and the averaging technique.

¹⁵ Our combined price index is a weighted geometric mean, with an 85% weight on books. The weight for online media starts at 0.5% in 1995 and gradually rises to 10% in 2014. Phone prices are weighted with the residual.

¹⁶ Our combined price index is a weighted geometric mean, with a 20% weight for sporting events, 70% weight for nonsports television programs, and 10% weight for television sets.

Relative Media Prices by Country

Around the world, we believe that media can be divided into two categories: global media and local media. We will argue that these categories have very different relative prices. Therefore, the average relative price for media in a specific country depends on the market share for global media versus local media. Furthermore, the market share for global media has changed over time.

The Olympics are a good example of global media. The Olympics have a huge fixed cost to produce, but the marginal cost of licensing rights to an additional country are nearly zero. Therefore, the International Olympic Committee (IOC) can maximize revenue by engaging in price discrimination. We collected data on licensing fees by region from the IOC's report on the 2004 games in Athens. In many cases, the licensing regions included multiple countries, so we cannot calculate precise prices for each country. However, we can identify general factors associated with higher prices.

Figure 15 shows that licensing fees for the Olympics are highly correlated with broadcast advertising expenditures for each region. The United States paid double the licensing fee that Europe did even though both regions have similar populations and income levels. This difference cannot be explained by the Olympics being targeted toward Americans; the 2004 Olympics were held in Europe and therefore live events occurred at times that were convenient for Europeans. Instead, the IOC just charged higher prices for the exact same content. For the remainder of this paper, we will assume that global media companies always follow a similar pricing strategy as that of the IOC. In other words, relative prices for global media are simply relative nominal advertising expenditures per user by media category.¹⁷

Given the pricing strategy observed in Figure 15, countries are able to get cheaper prices for global media if they reduce aggregate expenditures on global entertainment. Assuming that global supply is fixed, individual countries unambiguously benefit from cheaper prices for imported entertainment. This result may explain why European countries have restrictions on data collection for online media companies, limits on advertising length for television programs, and other rules that reduce aggregate advertising revenue. Conceptually, this is very similar to the way small countries negotiate lower prices for prescription drugs and other imported research and development (R&D).

Newspapers are a good example of local media. Most newspapers are sold within one city and cover local news for that city. Very few newspapers are sold globally. We were not able to find any producer price indexes by country. Instead, we use newsprint consumption as a proxy for real newspaper production. We then use the following formula to calculate prices:

$$\text{Newspaper Prices} = [(\text{Advertising Revenue}) + (\text{Circulation Revenue})] / (\text{Tons of Newsprint Used})$$

Our data on newsprint consumption are taken from the Food and Agriculture Organization of the United Nations. Our data on circulation revenue were taken from *World Press Trends 2008 Edition*. This report covered only 26 countries, so that is the number of countries we have in our sample.

Figure 16 shows that newspaper prices are highly correlated with the purchasing power parity indexes for recreation and culture produced by the 2011 International Comparison Program (ICP). On average, newspaper prices are higher in countries with higher GDP per capita. However, the relationship is definitely not one to one. The United States is a wealthy country, but it has relatively cheap newspapers. For the remainder of this paper, we assume that local media prices always track the ICP prices for recreation and culture.

¹⁷ When calculating price indexes, we assume that only people with Internet connections are users of online media. Furthermore, we assume that broadband subscribers use three times as much online media as other Internet users. However, we assume every individual uses television and radio. This assumption may slightly overestimate television consumption in very poor countries, but television is nearly universal in the developed world.

We need the market share for local programs to construct cross-country price indexes. For television broadcasting, we have some data on domestic content quotas by country. Most countries with such rules require television stations to devote about half of their airtime to domestically produced content. Therefore, it seems reasonable to assume that the local media share for television is around 50%.¹⁸ We do not have data on the local media share for other categories. However, we believe that the following split is reasonable: (a) newspapers are 100% local; (b) magazines are 95% local and 5% global; (c) radio broadcasts are 95% local and 5% global; and (d) online media are 25% local and 75% global. Cross-country media prices relative to the U.S. are presented in Tables 1 and 2 for 2010 and 1980, respectively. Global media prices relative to the U.S. are presented in Table 4.

Figures 17, 18, 19, and 20 graph combined prices for advertising-supported entertainment against nominal GDP per capita. For all years, we find a positive correlation between entertainment prices and income. However, the relationship becomes weaker over time. A 10% rise in nominal GDP per capita raises entertainment prices by 10.2% in 1980, 6.6% in 1990, 6.3% in 2000, and 6.7% in 2010. On average, countries with higher nominal GDP per capita tend to have higher overall prices. As a result, the results from Figures 14, 15, 16, and 17 are very similar if we graph entertainment prices against purchasing power parity.

Previously in this paper, we showed that wealthier countries devote a larger share of their nominal GDP to advertising-supported entertainment. This higher nominal GDP share is approximately balanced by the lower prices shown in Figures 17, 18, 19, and 20. On average, a 10% increase in real purchasing power parity per capita raised real consumption of advertising-supported entertainment by 11.6% in 1990, 10.9% in 2000, and 9.0% in 2010. Accordingly, our experimental methodology has little impact on real inequality or real inequality growth across countries. Later in this paper, we will use the data on real consumption of advertising-supported entertainment to calculate real GDP by country using our experimental methodology.

Real Advertising-Supported Entertainment

Figure 21 shows quantity indexes for advertising-supported entertainment from 1980 to 2013. We find that overall advertising-supported entertainment grew at 6.7% per year, about 4% faster than overall global GDP. Therefore, real GDP growth is faster under our experimental methodology. However, advertising-supported entertainment accounts for less than 0.5% of nominal GDP. Because advertising-supported entertainment is such a small share of the economy, its 4% faster real growth rate only raises overall growth rates by 0.018% per year.

Advertising-supported entertainment is frequently traded across national borders. For example, most countries allow Internet users to access U.S. websites without restriction. By construction, the nominal value of advertising-supported entertainment supplied always equals the nominal value of advertising viewership supplied. Our experimental methodology shows the same nominal GDP impact from foreign advertising-supported media and domestic advertising-supported media. However, real GDP does depend on the distinction between foreign and domestic. Domestically produced entertainment is valued at the price indexes shown in Figures 17, 18, 19, and 20. In contrast, imported entertainment is valued at the price of advertising viewership.

We do not have data on the domestic share for advertising-supported media. It is likely that virtually all advertising viewership for local media is produced and consumed within the same country.

¹⁸ In this paper, global media refers to the target market rather than the production location. Some global media may be produced in the same country it is shown.

Advertising viewership for global media can either be sold domestically or exported. Many local media companies license global content without any ads included¹⁹ and then sell advertising time to pay for the licensing costs. In that case, we consider the barter of advertising viewership for media content to be a domestic transaction. On the other hand, some local media license global content with ads already included for a reduced rate. In that case, we consider the barter of advertising viewership for media content to be an export of advertising viewership and an import of media services. We believe that most advertising viewership is probably sold locally. Based on that assumption, real GDP increases by the same amount as real consumption of advertising-supported entertainment.

Section 4. Discussion of Online Media

Nominal Growth in Online Entertainment over Time

We estimated that advertising-supported online entertainment added only \$50 billion to global GDP in 2011. This is less than the \$71 billion that U.S. consumers spent out of pocket on Internet access in 2011. We also estimate that consumers spent approximately 1.05 trillion hours of leisure time online.²⁰ Therefore, we calculate that advertising-supported websites spent only 4.8 cents on media for every hour spent online. Internet users may also benefit from nonmarket online activities such as fan fiction or personal web pages. As with almost all household production, those nonmarket activities are excluded from GDP.²¹

Another issue arises from the temporal interaction between the relatively new technology of the Internet and network effects. Search engines, social networks, and software more generally benefit from network effects. These network effects generate a revenue model that has been dubbed “URL”: Ubiquity now, Revenues Later. That is, Internet startups such as Twitter or Amazon first seek to reach a very large audience and then to generate revenue. The future potential revenue justifies a stock market value for the firm, which enables it to raise operating funds and to produce entertainment in anticipation of future advertising revenue streams from the consumers who are locked in. Thus, free entertainment can appear in the absence of current advertising revenue. In this case, advertising revenue understates the expenditure on consumer entertainment, which may be measured by the losses of the Internet firm that has expenses without offsetting revenues.

Consumers, in turn, may be aware that they will be locked-in in the future and may pay a higher rate for their entertainment in the future. The upshot is that current advertising revenues understate entertainment expenditures on the part of Internet media, and under our methodology, later data may overstate the growth rate of entertainment expenditures.

Our estimate of \$50 billion in online entertainment is not a trivial amount, but it is much lower than alternative estimates. For the United States alone, Brynjolfsson and Oh (2012) estimated a value of

¹⁹ It is possible that current GDP measures do not accurately measure prices for imported or exported media content. In that case, real GDP might not be measured correctly. However, this potential problem is not related to our experimental methodology, so we will not study it here.

²⁰ This includes work breaks devoted to leisure activity but excludes actual work using the Internet.

²¹ The BEA currently includes an imputed rental value for owner-occupied housing, which could be seen as a form of household production. SNA 2008 also recommends that countries include home-produced goods and do-it-yourself home repair in GDP.

\$376 billion in 2011 based on time use data.²² The Boston Consulting Group (Dean, Digrande, Field, Lundmark, O’Day, Pineda, and Zwillenberg 2012) estimated a value of \$500 billion in 2011, based on consumer surveys and an economic model. The much higher numbers are a consequence of different methodologies. Both studies use indirect methods to estimate the consumer utility gained from leisure time spent online. However, this paper is trying to estimate only the cost of producing online media. There are many areas of the economy in which consumer spending on an activity is much lower than total utility for that same activity. For example, sleeping occupies about one-third of total time and provides enormous utility to people. Yet, beds and mattresses represent a very small fraction of consumer spending.

On the other hand, our estimate of \$50 billion for 2011 is consistent with estimates of consumer value for high-speed Internet. In 2006, Greenstein and McDevitt (2010) estimated that U.S. households received \$20 billion to \$22 billion of value from broadband Internet. In comparison, we estimated that U.S. households enjoyed \$13 billion worth of online entertainment in 2006.²³ This \$13 billion excludes utility from nonadvertising online activities such as Wikipedia or Skype. We do not know how to adjust for those activities, but it seems plausible that adding them would raise our numbers enough to match Greenstein and McDevitt (2010).

Going forward, we speculate that online entertainment is likely to contribute less to global GDP than television does, in nominal terms. In the developed world, television broadcasting started in the late 1940s, and by 1960, more than 85% of U.S. households owned a television set. Between 1950 and 1960, nominal GDP growth in the United States rose by 0.013% annually if advertising-supported television is included in final expenditures. Around the world, advertising-supported television entertainment stabilized at 0.26% of nominal GDP in 2000. In comparison, the Internet basically started during the 1990s, and by 2010, more than 75% of U.S. households had Internet at home.²⁴ Between 2000 and 2010, nominal GDP growth in the United States rose by 0.0065% annually when online advertising-supported entertainment is included. Projecting forward, online entertainment will stabilize at 0.13% of GDP. This estimate, however, does not take into account that current entertainment may be supported by expectations of future, not-yet-realized revenue.

Effects of the Internet on Government Quality

Even though online entertainment accounts for only 25% of total advertising, the Internet has a large impact on the rest of the advertising industry. Since 2000, print media shrank from 0.5% of global GDP to 0.2% of global GDP. We believe that most of this change is caused by competition from the Internet. Newspapers and magazines have been sharing content for centuries, so they received little benefit from the improvements in telecommunication.²⁵ But consumers could not read individual newspaper articles cheaply until newspapers placed their stories online. Most consumers consider articles from different newspapers on the same topic to be close substitutes. Furthermore, the marginal cost for

²² Brynjolfsson and Oh’s paper (2012) values free websites, which is not exactly equivalent to advertising-supported websites. But that only explains a portion of the difference.

²³ Consumer utility from viewing websites = (Cost of Advertising-Supported Entertainment) + (Consumer Surplus from Websites) – (Disutility from Viewing Ads). We could measure neither the consumer surplus from websites nor the disutility from viewing ads. For simplicity, we assume they cancel out.

²⁴ Some of the remaining households had access through smartphones or their workplace Internet available for personal use.

²⁵ The Internet has reduced costs for sending stories and pictures around the world. But newspapers were using letters, telephones, and faxes long before the Internet existed. The Associated Press was founded in 1846.

publishing newspaper articles online is almost zero. As a result, competition has forced down the advertising revenue per story dramatically.

Many people are deeply concerned that the collapse of newspapers will lead to a decrease in government quality. Previously in this paper, we showed that print media advertising is highly correlated to GDP per capita. Journalists typically believe that the relationship is causal; reporters protect the public by uncovering government corruption and other negative behavior. In the long run, this higher government quality may lead to more economic growth and other social benefits.²⁶ If print media leads to higher government quality, then a decline in print media might reduce government quality. However, online media may be able to replace newspapers as government watchdogs. Blogs, Twitter, and other online resources enable ordinary citizens to report stories without the huge fixed costs of newspaper print presses and delivery vans. Furthermore, government authorities may find it harder to suppress social media than to censor newspapers. As a result, the net impact of Internet technology on government quality is theoretically ambiguous and may be positive in the long run.

Conclusion

“Free” consumer entertainment and information from the Internet, largely supported by advertising revenues, has had a major impact on consumer behavior. Similar large effects on consumers occurred with the arrival of free radio and television entertainment. Leaving this entertainment out of measures of real GDP appears, to many observers, to underestimate economic activity. We provide an experimental methodology that uses previously established national account procedures for imputing economic activity to evaluate these flows of entertainment and information. In implementing this, we find that real economic activity and consumption are greater, particularly in more advanced economies. However, these estimates show quite small impacts on the rate of growth of total expenditures, in large part because increases in online advertising expenditures are offset by decreases in print media. This shift in composition itself may be important in that online media is inherently global while replacing inherently local sources of entertainment such as print media. A limitation of our data is that some producers of online entertainment do not concurrently have advertising revenues, so advertising revenues then understate the expenditures on online entertainment.

As online entertainment shifts to smartphones and cloud computing, it attains an accessibility and usefulness that is unparalleled in past media. Some of this utility may be captured outside the current SNA framework by methods such as those employed by Brynjolfsson and Oh. How to place their insights within the system of national accounts is a subject for future work.

²⁶ There is some economic evidence supporting the connection between print journalism and civic participation (Gentzkow 2006, Olken 2009 and Gentzkow, Shapiro and Sinkison 2009) but the relationship is not that strong.

Figure 1: Advertising Expenditures Relative to Global GDP

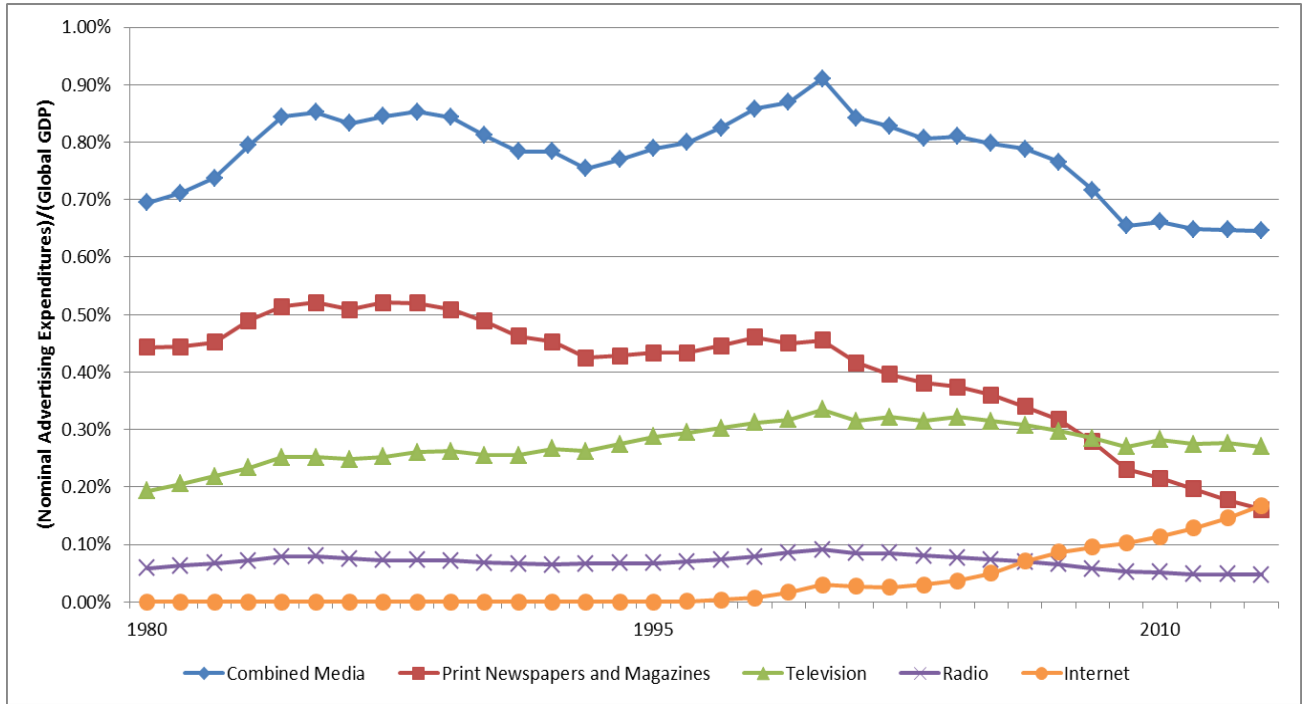


Figure 2: Advertising-Supported Entertainment Relative to Global GDP

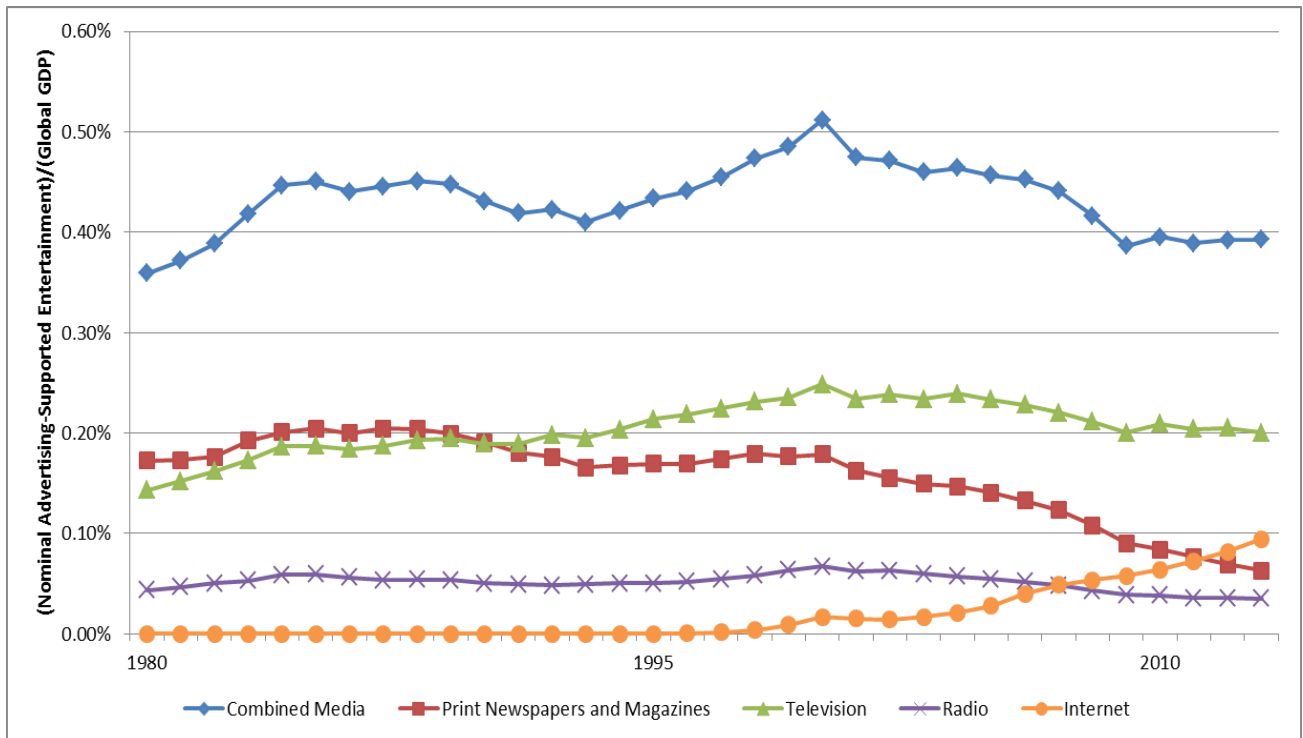


Figure 3: Advertising-Supported Entertainment vs. Nominal GDP per Capita in 1980

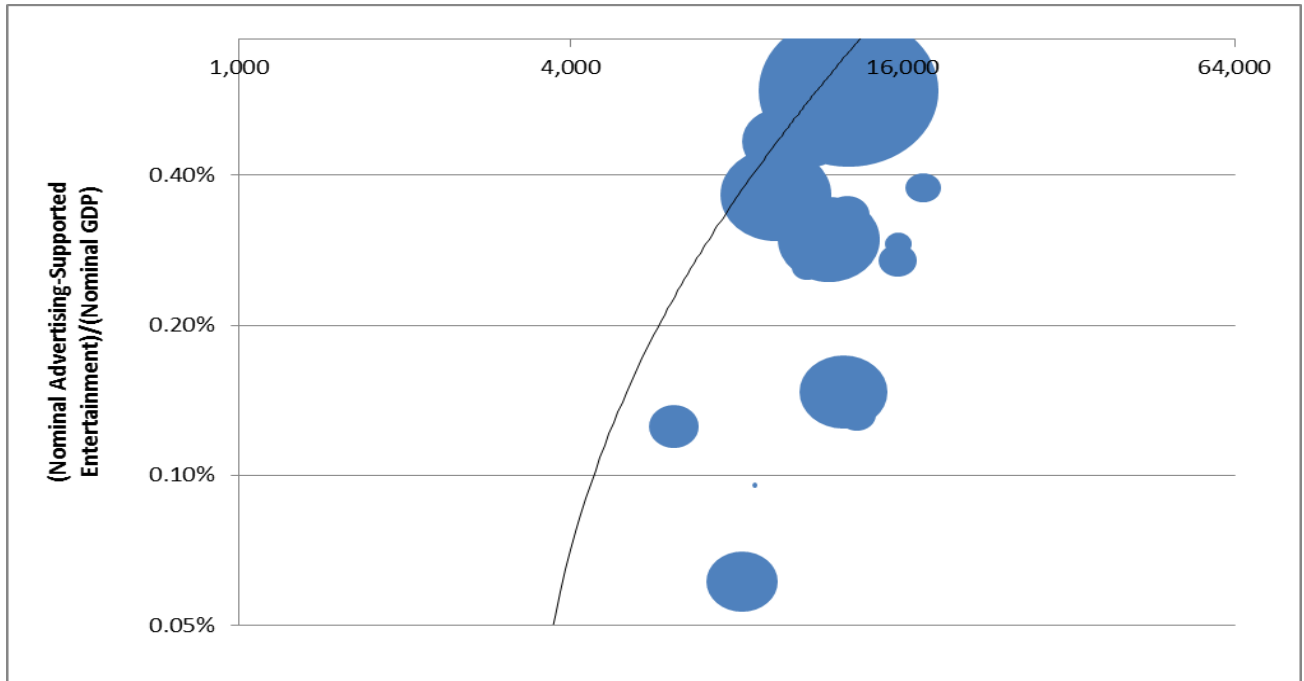


Figure 4: Advertising-Supported Entertainment vs. Nominal GDP per Capita in 1990

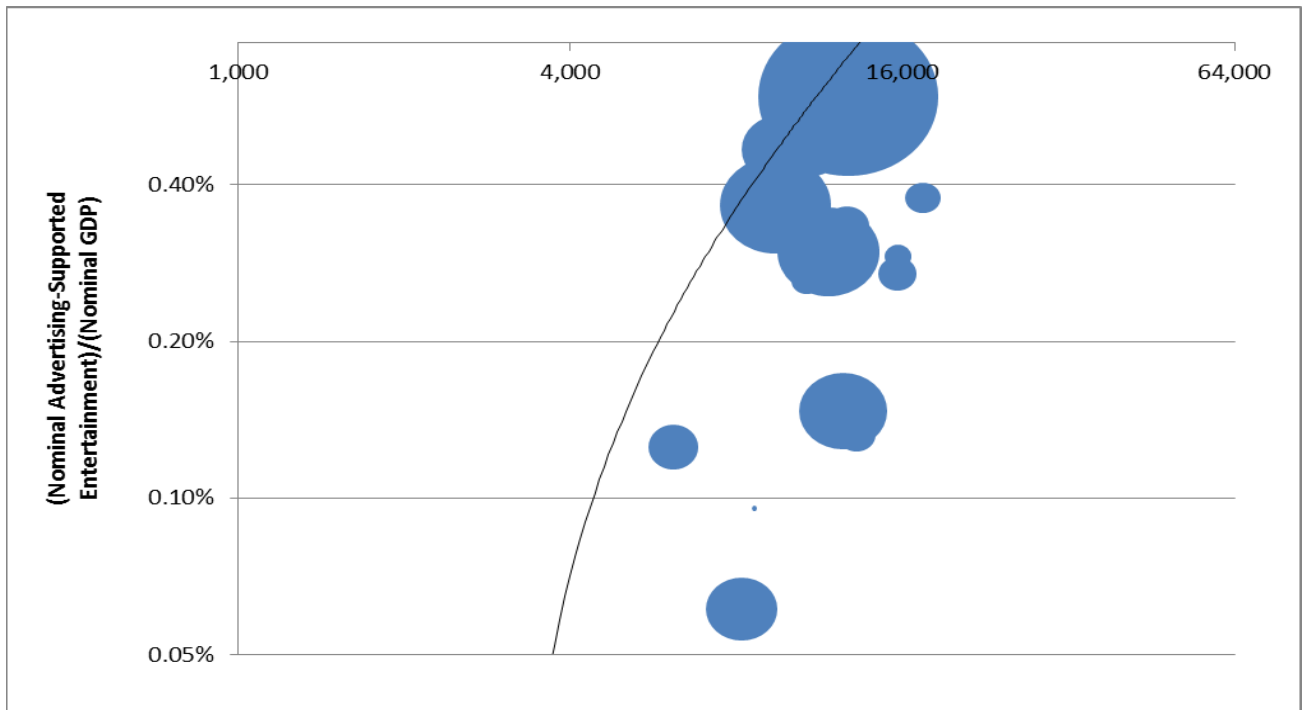


Figure 5: Advertising-Supported Entertainment vs. Nominal GDP per Capita in 2000

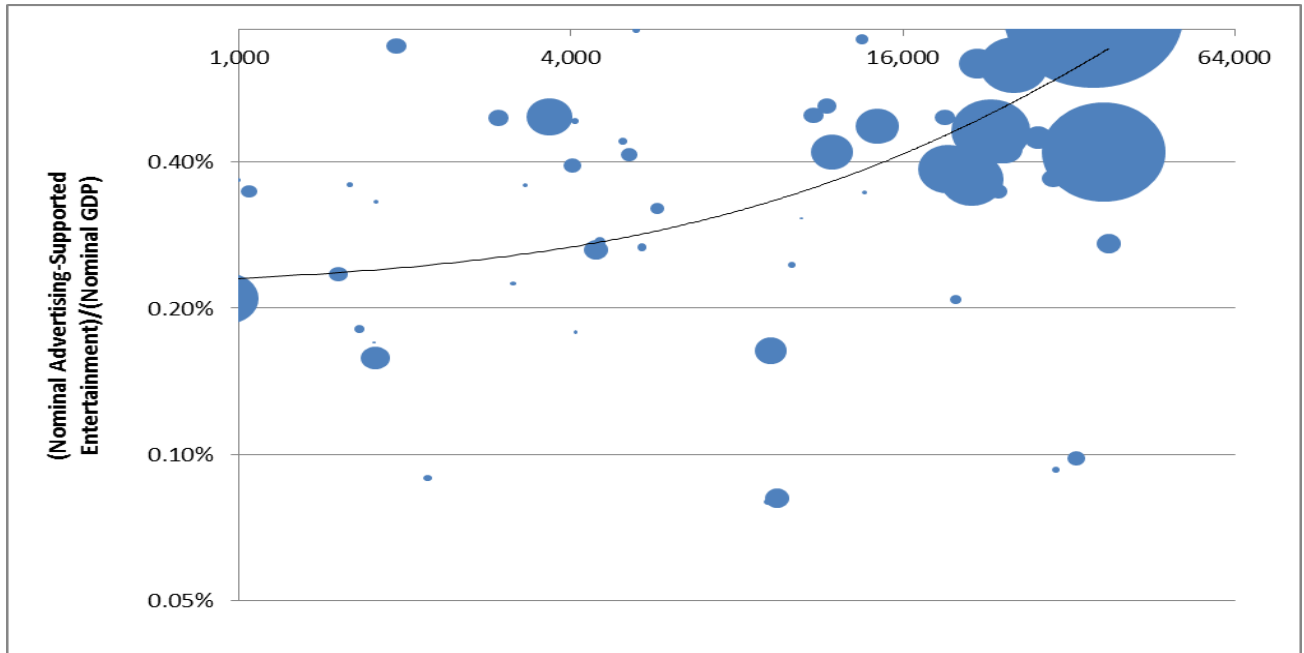


Figure 6: Advertising-Supported Entertainment vs. Nominal GDP per Capita in 2010

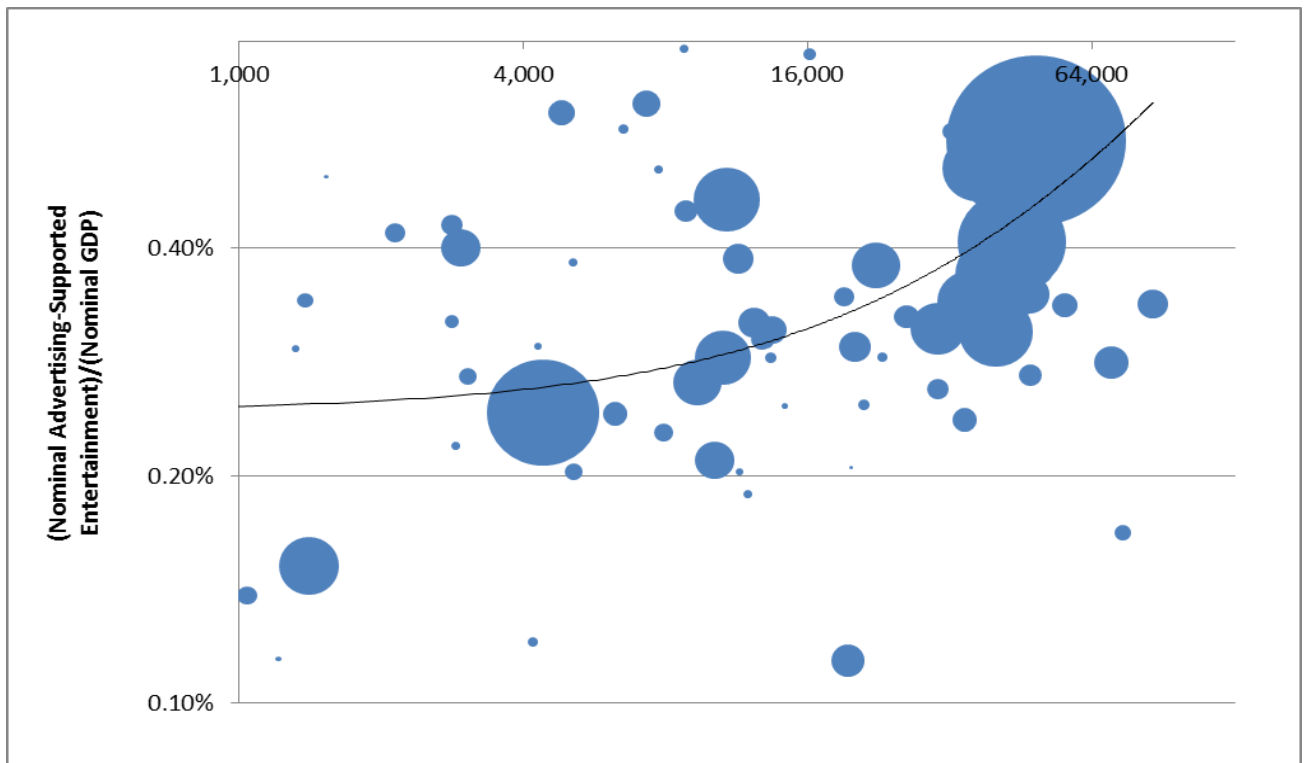


Figure 7: Advertising-Supported Entertainment by Country Over Time

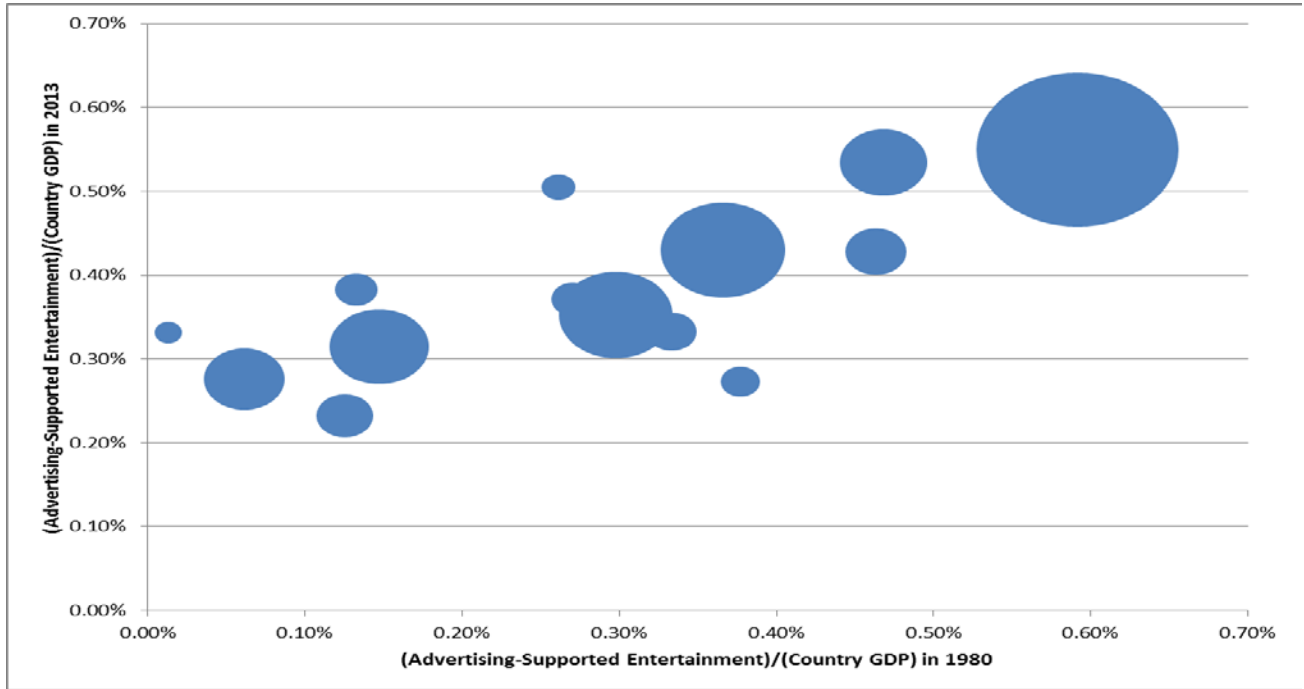


Figure 8: Advertising-Supported Entertainment by Language

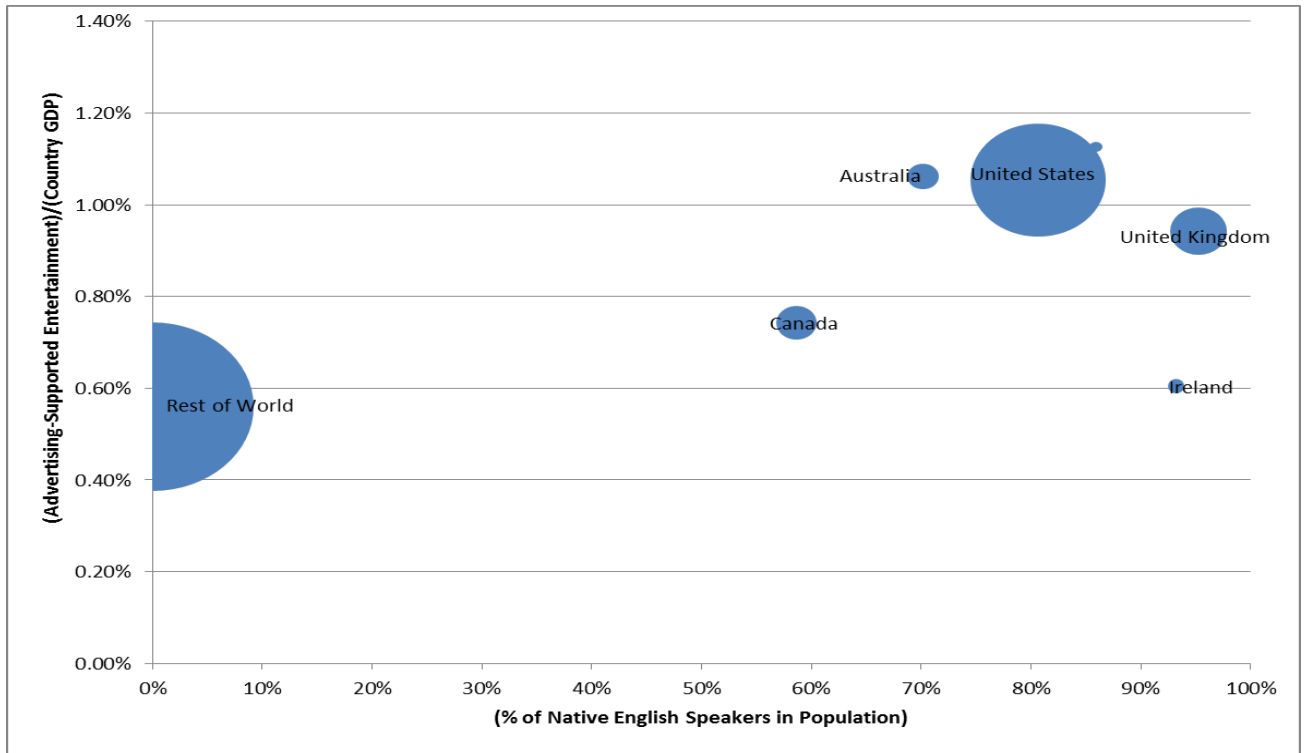


Figure 9: Advertising-Supported Broadcasting vs. Public Broadcasting

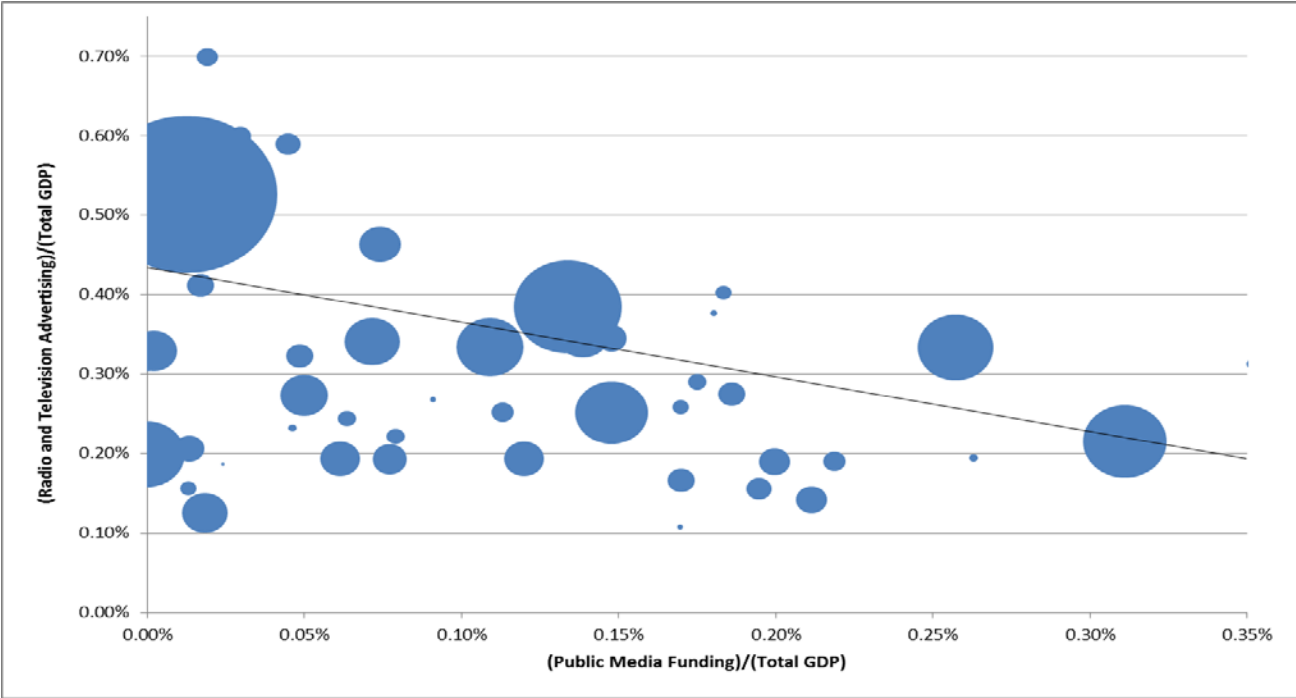


Figure 10: Advertising-Supported Print and Internet vs. Public Broadcasting

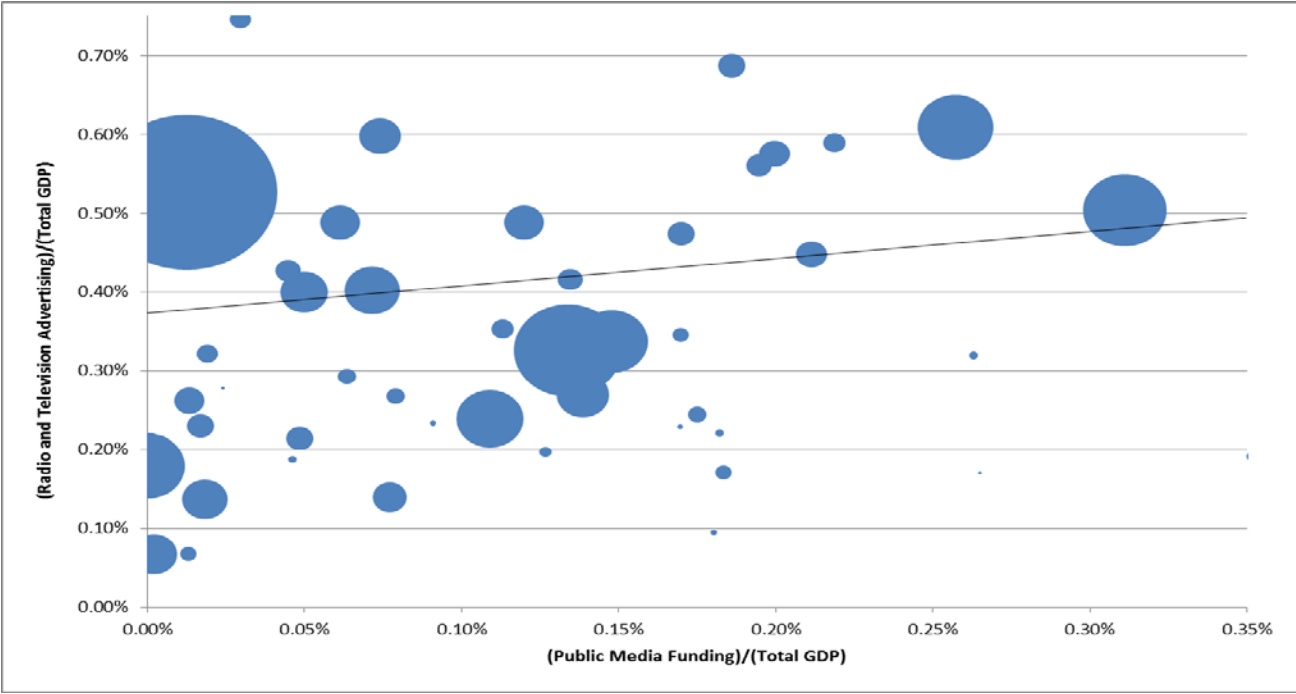


Figure 11: Advertising-Supported Entertainment vs. Personal Consumption

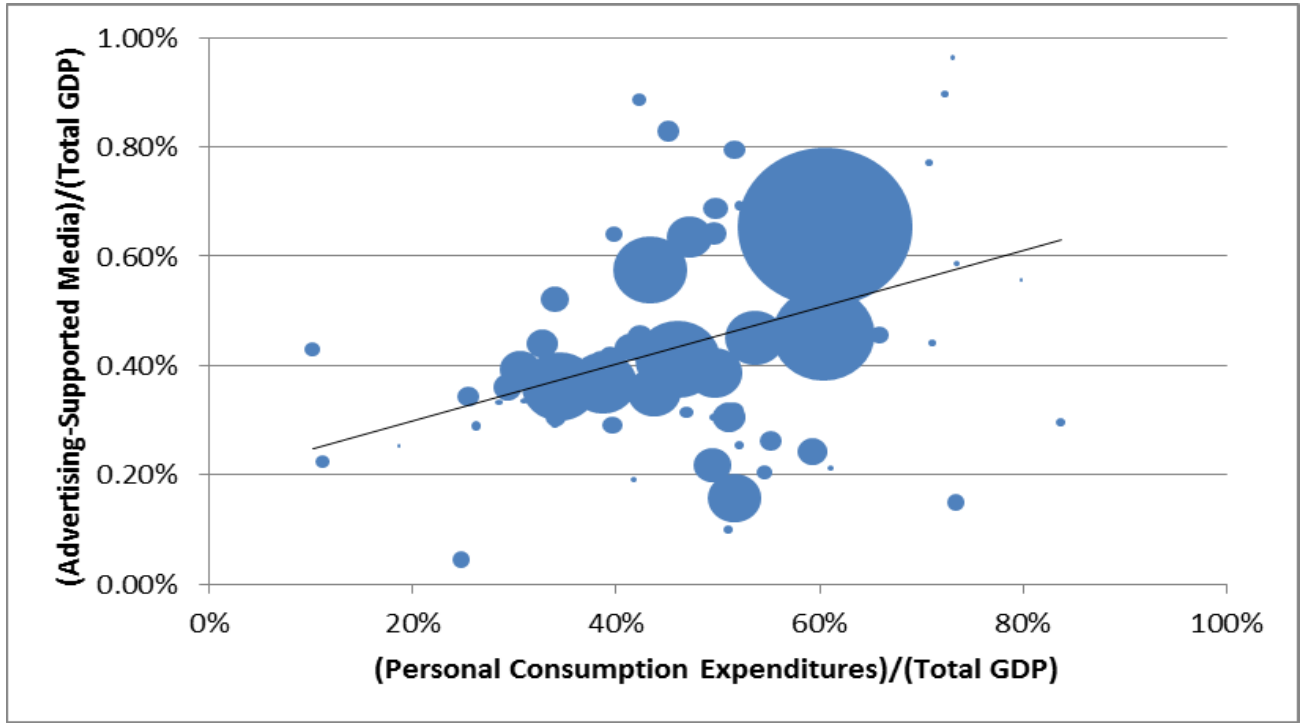


Figure 12: U.S. Prices for Online Media

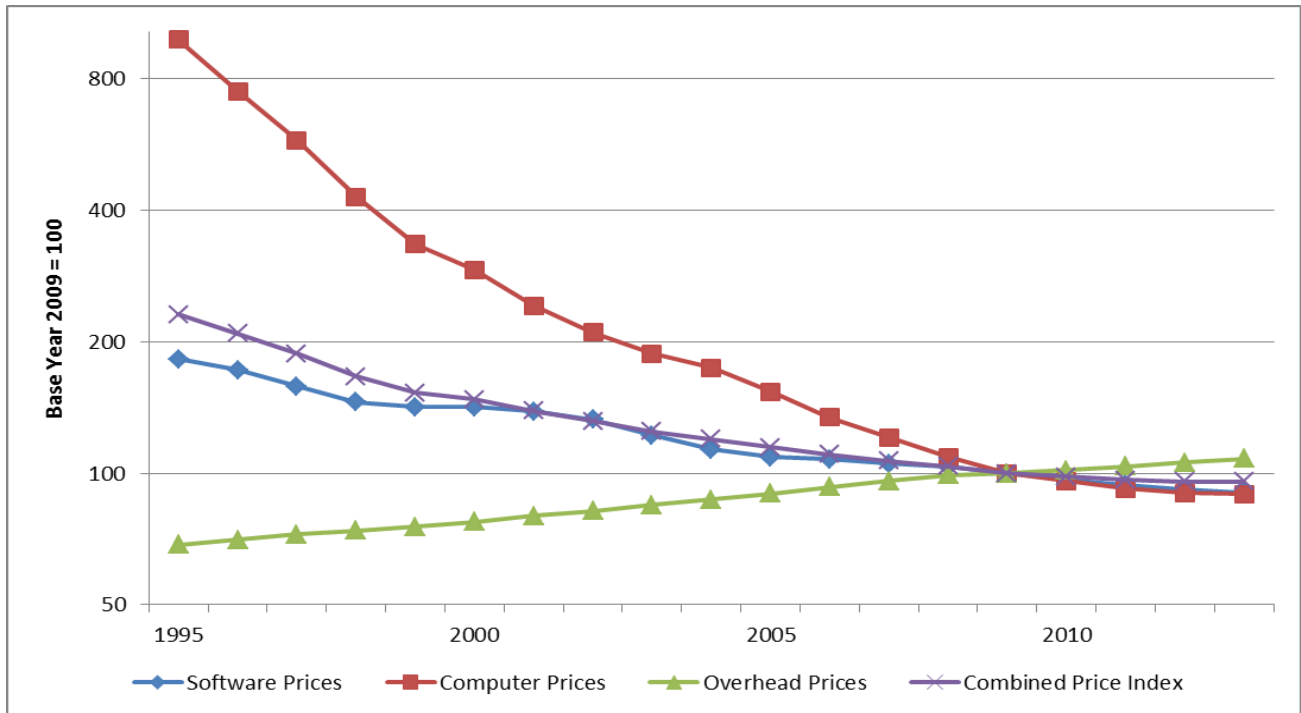


Figure 13: U.S. Prices for Newspapers and Magazines

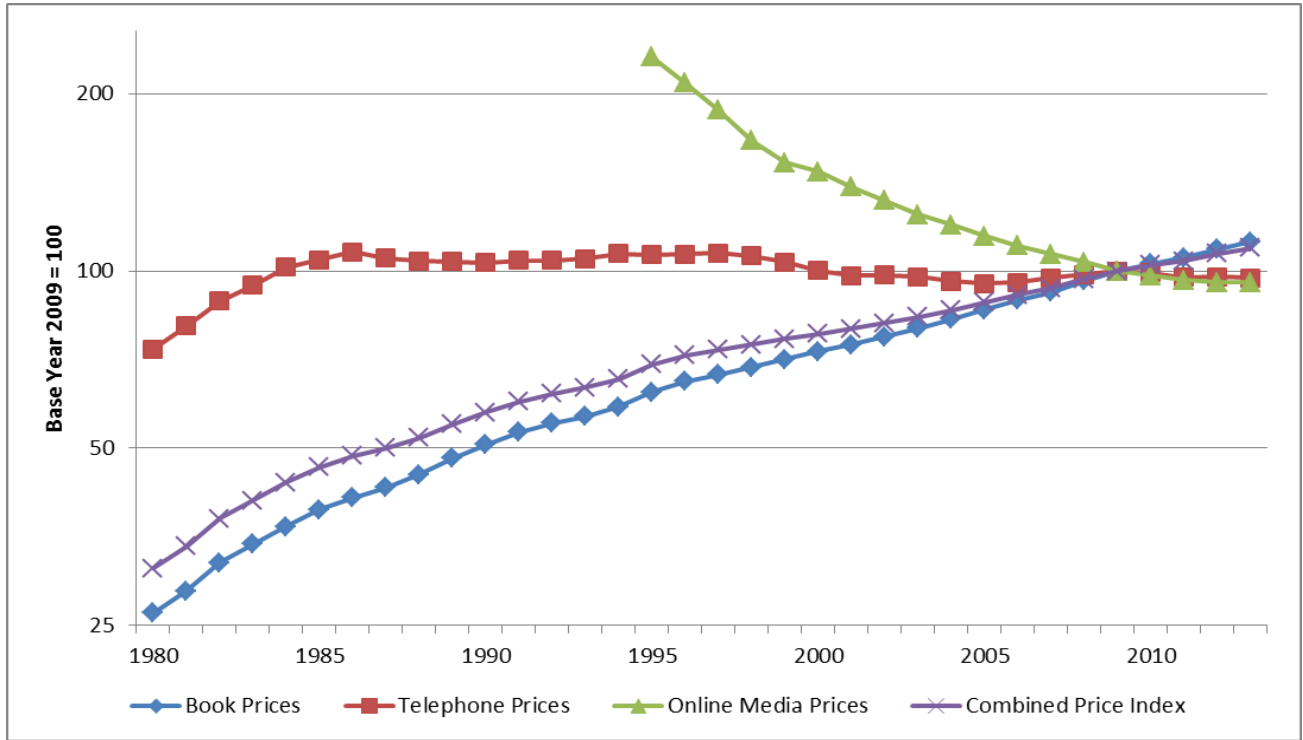


Figure 14: U.S. Prices for Television and Radio

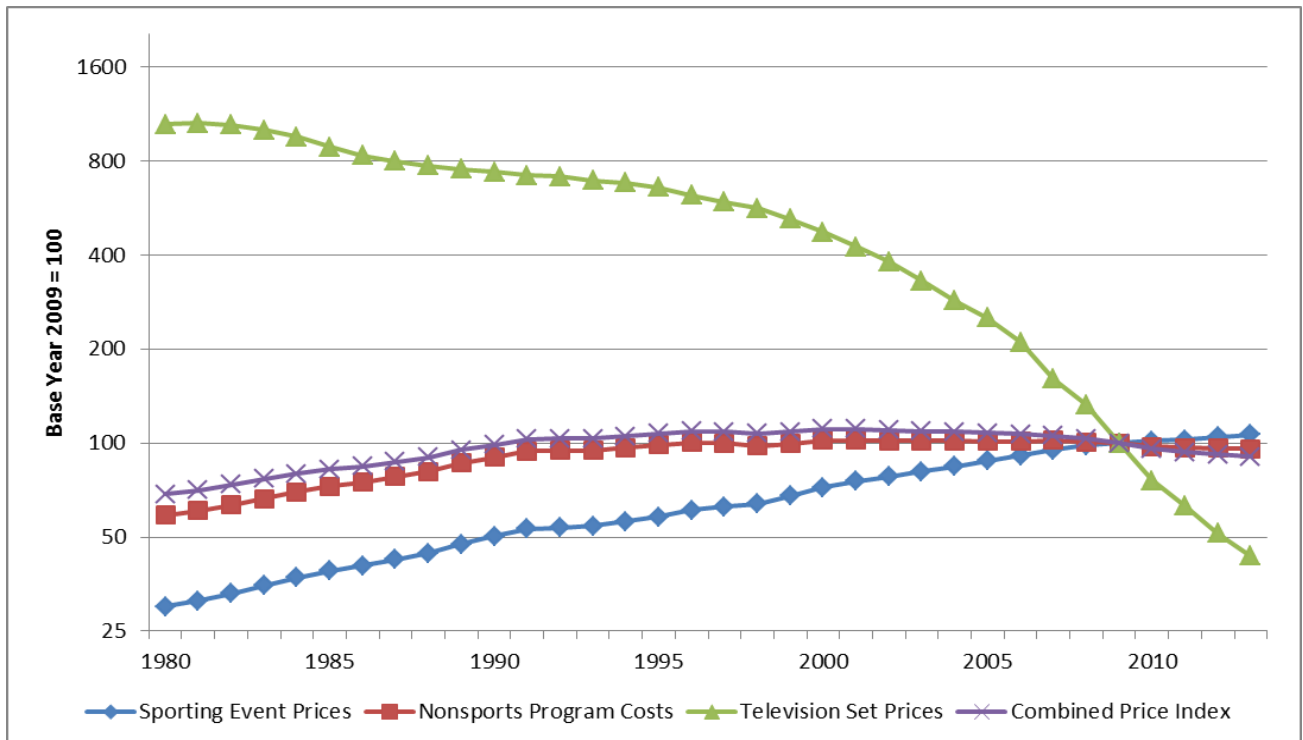


Figure 15: Olympic Licensing Fees vs. Total Broadcast Advertising

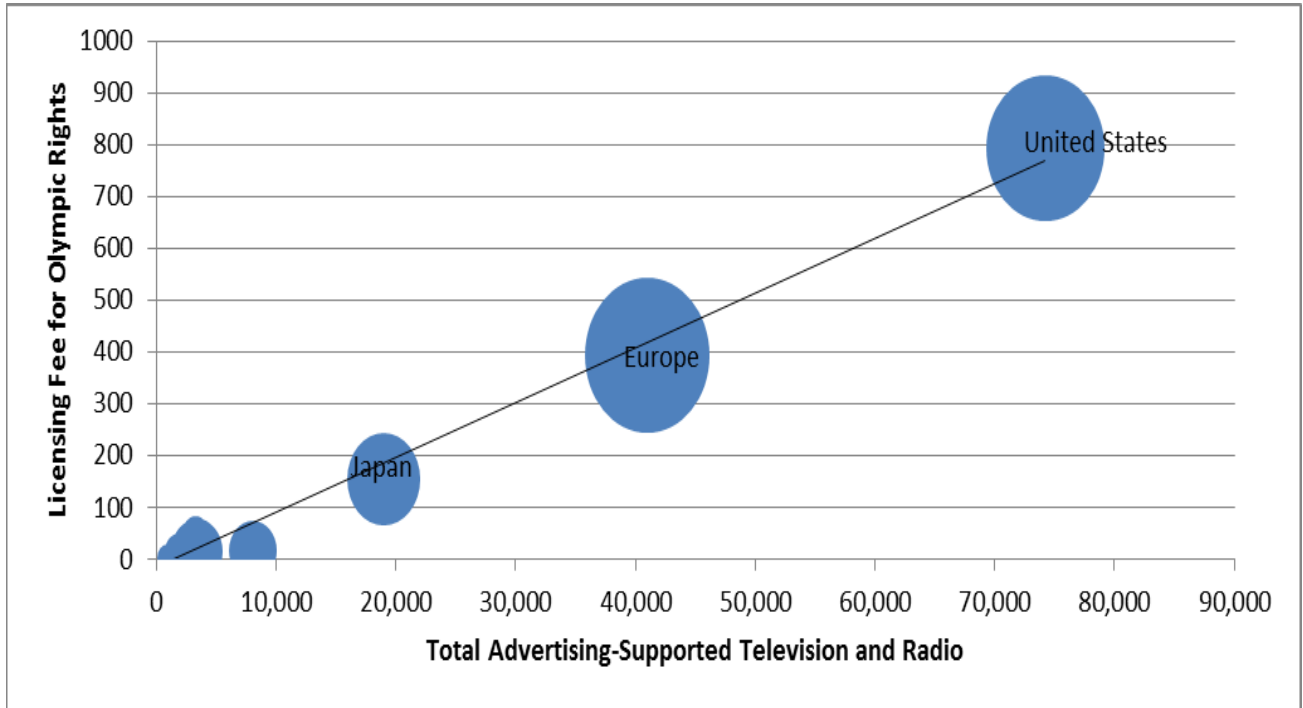


Figure 16: Newspaper Prices vs. Purchasing Power Parity for Recreation

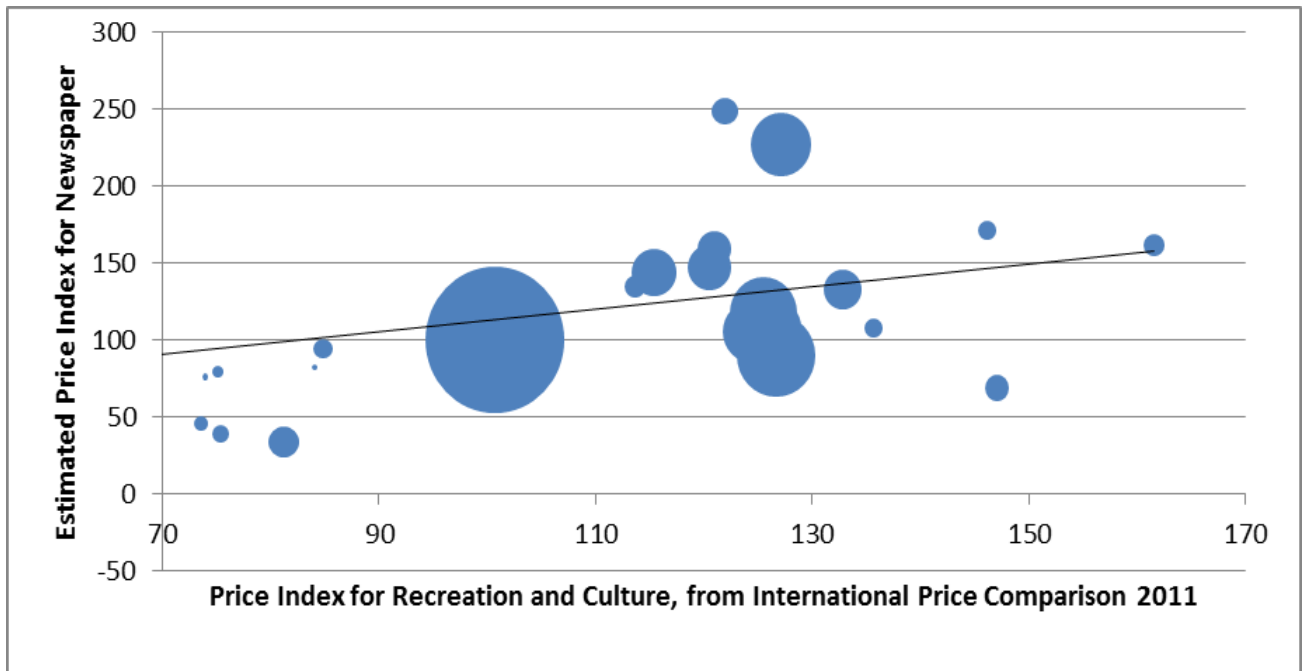


Figure 17: Entertainment Prices vs. Nominal GDP per Capita in 1980

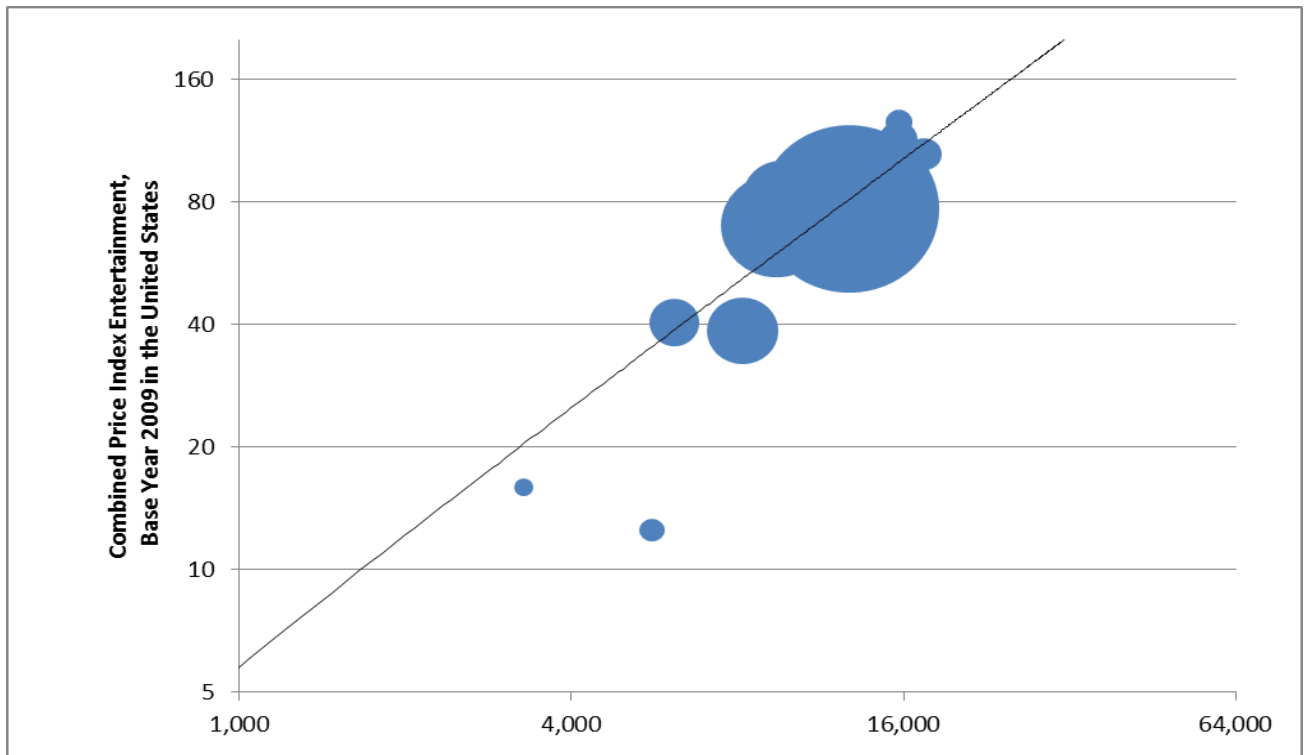


Figure 18: Entertainment Prices vs. Nominal GDP per Capita in 1990

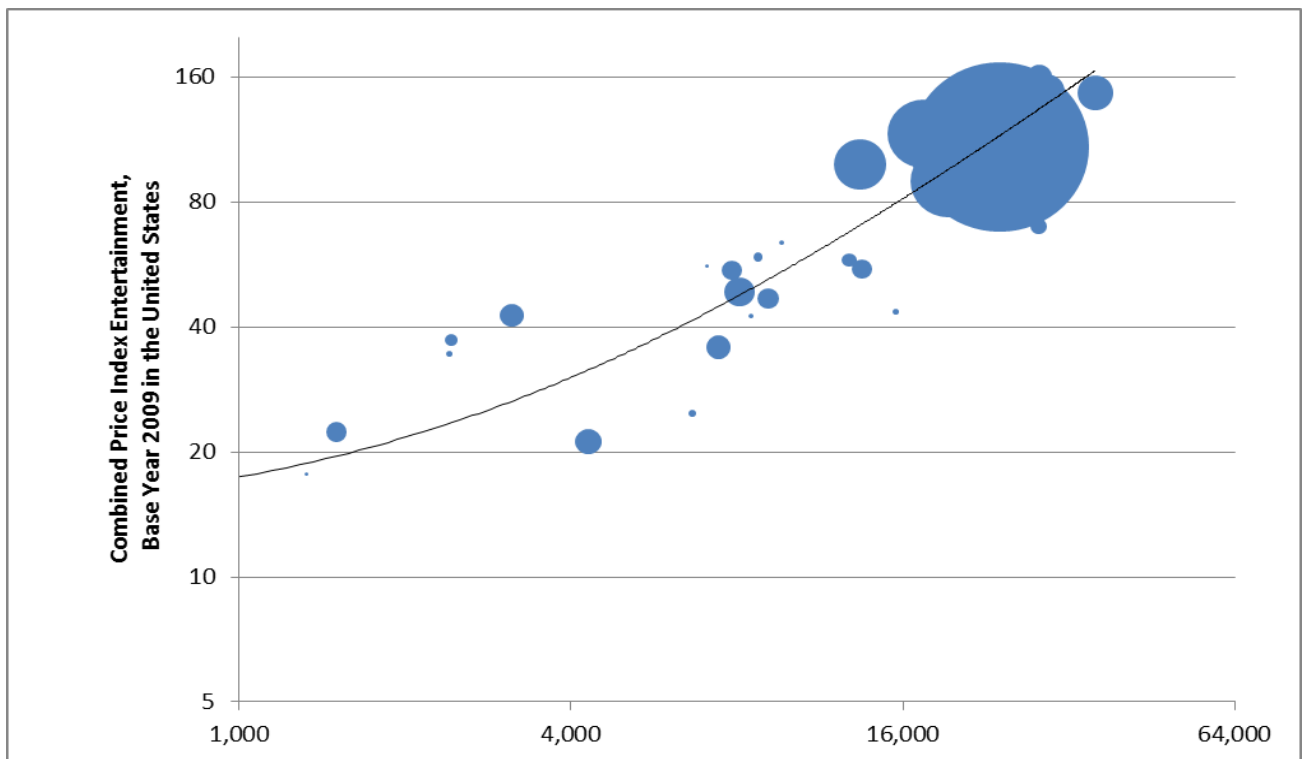


Figure 19: Entertainment Prices vs. Nominal GDP per Capita in 2000

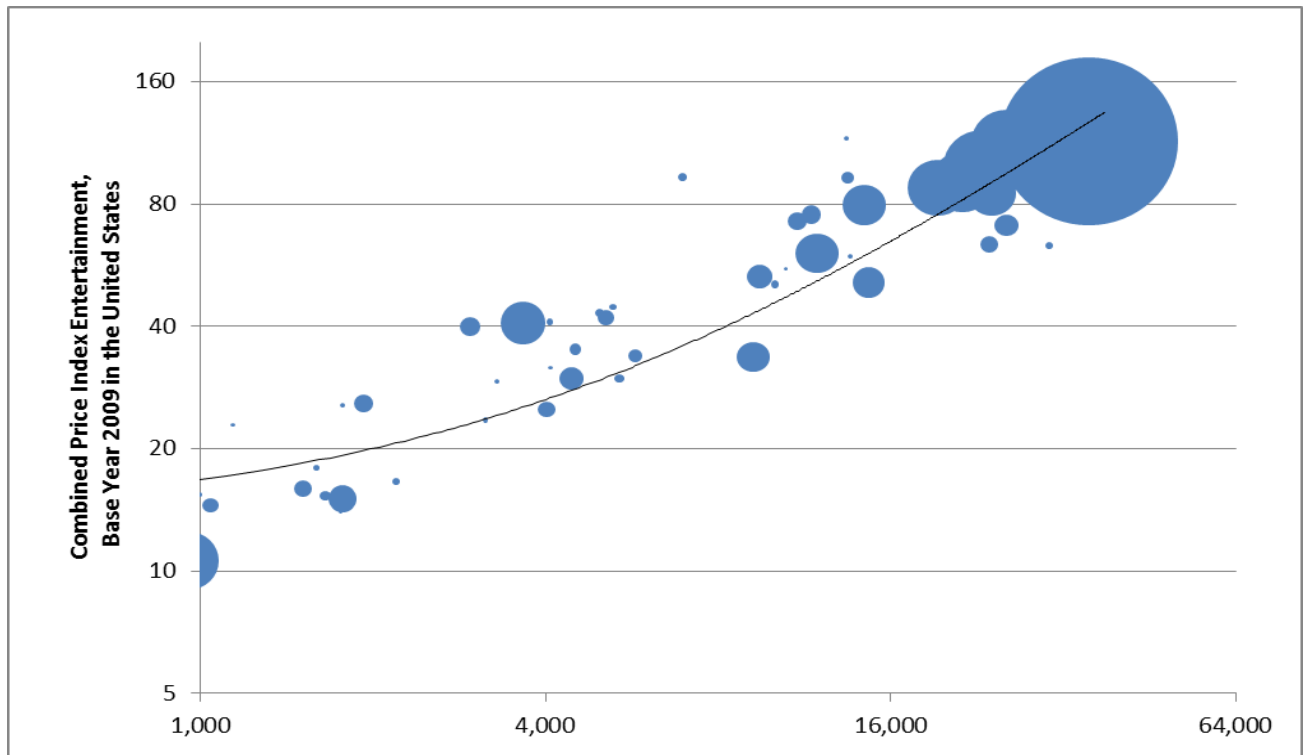


Figure 20: Entertainment Prices vs. Nominal GDP per Capita in 2010

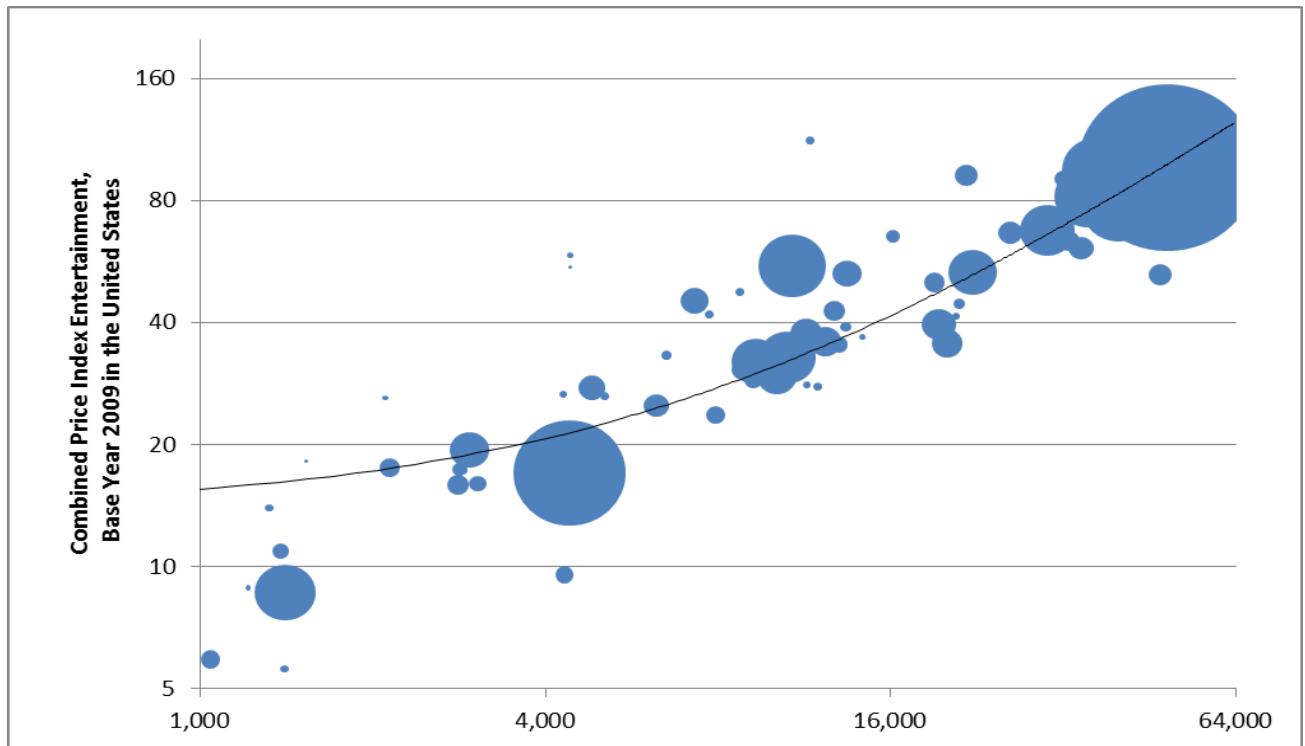
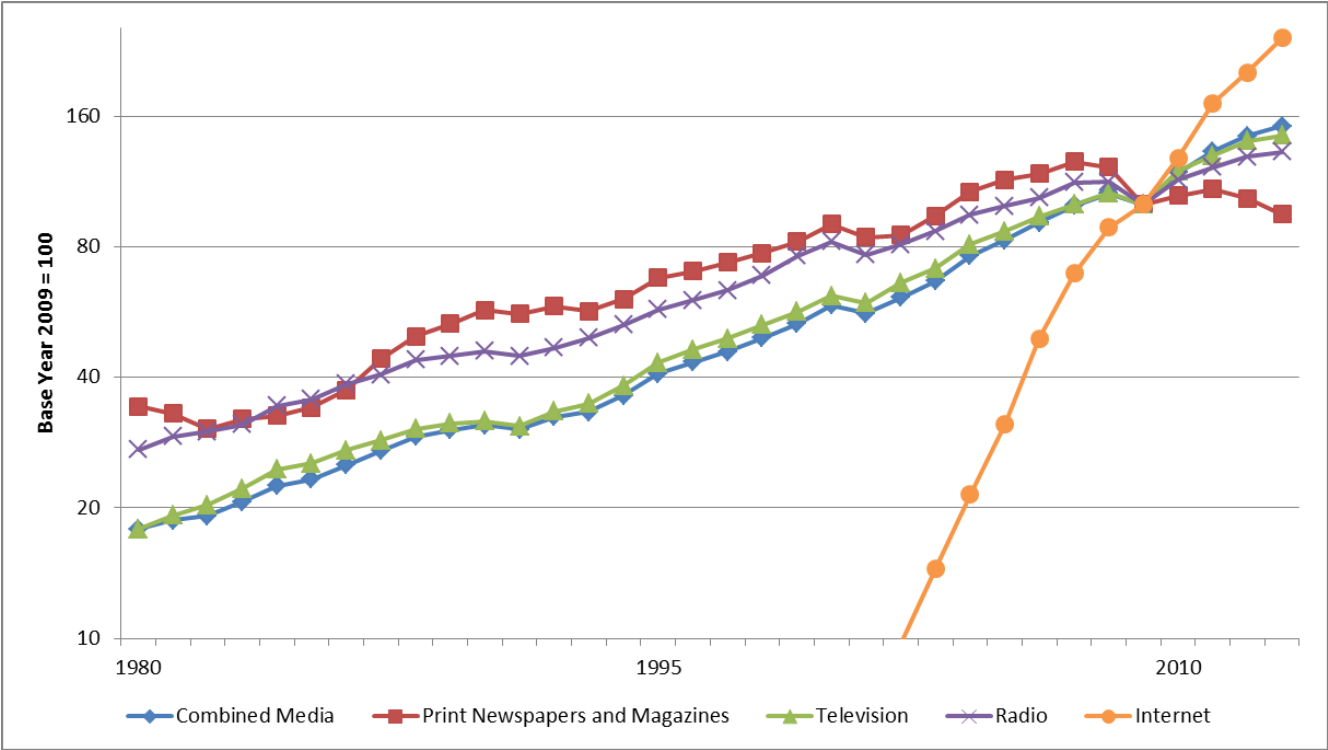


Figure 21: Global Quantity Indexes for Advertising-Supported Entertainment



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Table 1: Advertising by Country in 2010

Country	Pop.	GDP Per Capita	Nominal Advertising Expenditures Relative to GDP					Media Prices, Relative to U.S.		
			News-papers	Maga-zines	TV	Radio	Internet	Local	Global TV	Global Internet
Algeria	37	4,313	0.03%	0.00%	0.04%	0.01%	0.00%	63	0.8	0.4
Argentina	40	11,386	0.23%	0.03%	0.33%	0.02%	0.03%	66	19.9	7.6
Australia	22	50,000	0.32%	0.08%	0.37%	0.09%	0.19%	144	99.1	111.4
Austria	8	45,294	0.52%	0.15%	0.23%	0.06%	0.09%	132	54.4	49.7
Bahrain	1	20,775	0.28%	0.08%	0.15%	0.01%	-	62	16.5	24.1
Belgium	11	43,119	0.17%	0.08%	0.28%	0.08%	0.09%	124	64.1	43.3
Bosnia and Herzegovina	4	4,420	0.11%	0.06%	2.19%	-	-	68	51.5	0.0
Brazil	195	10,769	0.09%	0.05%	0.47%	0.03%	0.07%	118	27.2	19.1
Bulgaria	7	6,490	0.09%	0.07%	0.66%	0.02%	0.02%	59	22.9	2.4
Canada	34	47,059	0.21%	0.07%	0.24%	0.10%	0.14%	131	60.6	65.8
Chile	17	12,791	0.14%	0.01%	0.26%	0.03%	0.03%	95	18.0	8.0
China	1,340	4,403	0.11%	0.01%	0.17%	0.03%	0.08%	48	4.0	9.9
Colombia	46	6,250	0.08%	0.02%	0.18%	0.08%	-	72	6.0	4.7
Costa Rica	5	7,709	0.26%	0.10%	0.36%	0.12%	-	84	14.6	5.1
Croatia	4	13,356	0.07%	0.07%	0.25%	0.03%	0.05%	90	17.8	9.7
Cyprus	1	27,729	0.04%	0.03%	0.34%	0.04%	0.01%	116	50.3	3.0
Czech Republic	11	19,048	0.09%	0.06%	0.24%	0.03%	0.16%	83	24.1	45.8
Denmark	6	55,879	0.23%	0.07%	0.13%	0.01%	0.19%	164	38.5	97.2
Egypt	78	2,817	0.26%	0.02%	0.34%	0.03%	-	36	5.1	6.1
Estonia	1	14,270	0.13%	0.03%	0.15%	0.05%	0.07%	92	11.2	11.5
Finland	5	44,748	0.33%	0.09%	0.16%	0.03%	0.13%	149	38.9	59.0
France	65	40,000	0.11%	0.09%	0.20%	0.04%	0.11%	129	41.6	43.3
Germany	82	40,342	0.25%	0.10%	0.17%	0.03%	0.14%	127	37.5	58.3
Ghana	24	1,317	0.05%	-	0.23%	0.13%	-	63	1.6	2.2
Greece	11	25,893	0.12%	0.22%	0.24%	0.03%	0.04%	118	33.1	17.1
Guatemala	14	2,867	0.19%	0.02%	0.14%	0.01%	-	58	2.1	7.2
Honduras	8	2,099	0.58%	0.03%	0.62%	0.07%	-	60	6.9	6.7
Hong Kong	7	32,744	0.54%	0.25%	0.62%	0.07%	0.07%	59	108.6	25.4
Hungary	10	13,000	0.09%	0.11%	0.20%	0.04%	0.10%	73	14.0	17.4
India	1,210	1,405	0.12%	0.01%	0.11%	0.01%	0.01%	41	0.8	2.1
Indonesia	241	2,946	0.23%	0.02%	0.36%	-	-	45	5.6	0.0
Ireland	5	46,051	0.26%	0.01%	0.18%	0.06%	0.07%	137	43.8	43.8
Israel	8	30,169	0.12%	0.02%	0.19%	0.03%	0.07%	129	30.8	27.5
Italy	59	35,413	0.09%	0.06%	0.30%	0.03%	0.07%	129	56.8	36.5
Japan	127	43,307	0.12%	0.05%	0.34%	0.02%	0.13%	137	77.9	60.5

Jordan	6	4,301	0.47%	0.03%	0.05%	-	-	56	1.2	9.9
Kazakhstan	16	9,202	0.03%	0.01%	0.28%	0.02%	-	62	13.9	16.5
Kenya	41	782	0.26%	0.02%	0.66%	1.00%	-	54	2.7	0.8
Korea, Republic	49	22,267	0.19%	0.02%	0.26%	0.01%	0.15%	89	31.1	30.6
Kuwait	3	40,113	0.41%	0.04%	0.36%	0.01%	-	87	77.0	47.4
Latvia	2	11,442	0.04%	0.03%	0.16%	0.04%	0.05%	82	9.8	7.0
Lebanon	4	8,754	0.16%	0.13%	0.83%	0.02%	-	60	38.7	0.0
Lithuania	3	11,946	0.06%	0.04%	0.16%	0.03%	0.03%	78	10.1	4.5
Macedonia	2	4,424	0.13%	0.06%	2.64%	0.07%	0.01%	59	62.2	0.5
Malaysia	28	8,834	0.39%	0.02%	0.31%	0.04%	0.02%	51	14.4	3.6
Malta	0	19,782	0.14%	0.07%	0.12%	0.03%	0.02%	95	12.9	5.0
Mexico	118	9,322	0.03%	0.01%	0.28%	0.04%	0.02%	79	13.8	6.7
Morocco	32	2,826	0.10%	0.02%	0.26%	0.07%	-	63	3.8	3.9
Mozambique	24	388	0.03%	-	0.22%	0.02%	-	65	0.5	1.2
Netherlands	17	46,988	0.19%	0.09%	0.15%	0.04%	0.18%	124	37.2	74.5
New Zealand	4	32,052	0.32%	0.11%	0.31%	0.12%	0.13%	128	53.3	48.2
Nicaragua	6	1,528	0.16%	0.00%	0.51%	0.06%	-	60	4.2	0.0
Norway	5	85,903	0.26%	0.05%	0.13%	0.02%	0.17%	191	60.7	129.3
Oman	3	21,051	0.41%	0.01%	0.04%	-	-	63	4.6	40.7
Pakistan	173	1,040	0.04%	0.00%	0.15%	0.01%	0.00%	35	0.8	0.8
Peru	29	5,119	0.06%	0.01%	0.18%	0.04%	0.01%	66	5.0	1.9
Philippines	93	2,141	0.04%	0.01%	0.45%	0.09%	-	50	5.1	0.0
Poland	38	12,304	0.05%	0.06%	0.26%	0.04%	0.10%	72	17.2	20.4
Portugal	11	21,698	0.15%	0.13%	0.81%	0.06%	-	115	93.5	26.4
Qatar	2	74,298	0.28%	0.01%	0.01%	0.00%	-	87	3.0	66.3
Romania	20	7,921	0.05%	0.05%	0.21%	0.04%	0.02%	62	8.7	3.0
Russia	142	10,563	0.05%	0.05%	0.27%	0.02%	0.06%	72	15.1	15.2
Saudi Arabia	27	19,414	0.16%	0.01%	0.01%	0.00%	-	68	0.9	28.5
Serbia	7	5,074	0.15%	-	0.35%	0.03%	0.03%	69	9.4	3.9
Singapore	5	47,275	0.21%	0.03%	0.16%	0.05%	0.03%	67	40.1	16.7
Slovak Republic	5	16,137	0.09%	0.08%	0.78%	0.07%	0.05%	84	66.9	12.2
Slovenia	2	22,942	0.14%	0.11%	0.17%	0.04%	0.07%	110	21.0	19.8
South Africa	51	7,269	0.26%	0.10%	0.50%	0.14%	0.02%	81	19.2	8.4
Spain	47	30,043	0.11%	0.04%	0.23%	0.05%	0.08%	118	37.4	30.5
Sweden	9	49,050	0.26%	0.06%	0.17%	0.02%	0.17%	152	45.1	80.1
Switzerland	8	70,288	0.23%	0.11%	0.12%	0.02%	0.09%	170	44.1	57.3
Taiwan	23	20,086	0.11%	0.03%	0.19%	0.02%	-	55	20.8	27.6
Tanzania	44	528	0.05%	0.00%	0.13%	0.13%	-	48	0.4	2.5
Thailand	66	4,819	0.18%	0.06%	0.60%	0.06%	0.03%	48	15.4	6.8
Tunisia	11	4,190	0.03%	0.01%	0.10%	0.05%	0.00%	67	2.2	0.2
Turkey	72	10,125	0.08%	0.01%	0.18%	0.01%	0.05%	80	9.9	13.0

Uganda	34	471	0.18%	0.01%	0.21%	0.65%	-	49	0.5	0.5
Ukraine	46	3,050	0.05%	0.07%	0.27%	0.02%	0.03%	55	4.4	3.1
U.A.E.	8	34,354	0.32%	0.07%	0.05%	0.01%	-	96	9.4	30.2
United Kingdom	63	36,624	0.22%	0.07%	0.29%	0.04%	0.28%	124	56.3	100.6
United States	309	48,544	0.16%	0.09%	0.39%	0.10%	0.18%	100	100.0	100.0
Uruguay	3	11,566	0.27%	0.05%	2.62%	-	-	103	161.7	6.1
Venezuela	29	13,448	0.16%	0.05%	0.21%	0.07%	0.04%	120	15.1	15.7
Vietnam	87	1,381	0.06%	0.03%	0.41%	0.00%	-	37	3.0	0.0
Yemen	23	1,404	-	-	0.02%	-	-	46	0.1	8.1
Zambia	13	1,212	0.06%	-	0.08%	0.03%	-	66	0.5	1.6

Table 2: Advertising by Country in 1980

Country	Population	GDP Per Capita	Nominal Advertising Expenditures Relative to GDP				Media Prices, Relative to U.S.	
			Newspapers	Magazines	TV	Radio	Local	Global TV
Austria	8	10,729	0.26%	0.05%	0.13%	0.05%	120.12	36.68
Belgium	10	13,185	0.18%	0.12%	0.03%	0.00%	121.55	9.89
Canada	25	10,976	0.39%	-	0.23%	0.13%	105.14	66.15
Denmark	5	13,664	0.56%	0.11%	-	-	157.72	8.62
Finland	5	11,089	0.41%	0.11%	0.10%	-	142.00	29.94
France	55	12,500	0.10%	0.14%	0.05%	0.04%	128.11	17.61
Germany	78	11,750	0.37%	0.23%	0.08%	0.03%	126.00	24.13
Greece	10	5,600	0.00%	0.00%	0.01%	0.00%	106.00	1.90
Italy	56	8,156	0.03%	0.07%	0.03%	0.01%	121.99	7.09
Japan	117	9,402	0.26%	0.05%	0.27%	0.04%	110.05	68.51
Netherlands	14	12,676	0.53%	0.19%	0.06%	0.01%	118.09	19.76
Norway	4	15,665	0.57%	0.11%	-	-	166.56	3.40
Portugal	10	3,276	0.01%	-	0.02%	0.01%	103.57	1.68
Spain	37	6,150	0.07%	0.04%	0.08%	0.03%	109.49	13.19
Sweden	8	15,642	0.54%	0.10%	0.00%	0.00%	143.71	1.49
Switzerland	6	17,406	0.59%	0.22%	0.08%	0.00%	148.12	34.76
United Kingdom	56	9,591	0.46%	0.20%	0.27%	0.02%	123.58	68.11
United States	227	12,775	0.51%	0.21%	0.30%	0.12%	100.00	100.00

Table 3: Advertising in the United States from 1980 to 2013

Year	Real Advertising Expenditures, 2009 U.S. \$						Media Prices (Base, 2009 U.S.)		
	Newspapers	Magazines	TV	Radio	Internet	Total	Newspapers/ Magazines	TV/Radio	Internet
1980	16.7	6.8	12.5	5.3	-	41.3	89	68	-
1981	17.0	7.0	13.7	5.8	-	43.5	97	71	-
1982	16.0	6.6	14.8	6.2	-	43.6	107	74	-
1983	18.6	6.9	16.7	6.7	-	48.8	114	77	-
1984	19.3	7.4	19.0	7.7	-	53.4	122	80	-
1985	20.0	7.5	19.6	8.1	-	55.3	126	82	-
1986	20.8	7.5	20.7	8.5	-	57.5	130	84	-
1987	23.2	8.0	21.3	8.5	-	61.1	127	87	-
1988	24.9	8.7	22.1	8.9	-	64.7	125	90	-
1989	25.9	9.6	22.5	9.0	-	67.0	125	95	-
1990	25.9	9.8	21.8	8.9	-	66.4	124	99	-
1991	24.2	9.5	20.6	8.5	-	62.8	125	103	-
1992	24.4	10.1	21.9	8.6	-	65.1	126	103	-
1993	24.6	10.6	22.8	9.4	-	67.4	126	103	-
1994	26.5	11.0	24.7	10.3	-	72.5	129	105	-
1995	28.1	11.9	27.4	10.9	0.0	78.4	128	107	-
1996	29.8	12.7	29.5	11.6	0.1	83.7	128	109	209
1997	32.6	13.8	31.1	12.7	0.5	90.8	127	109	187
1998	35.6	15.0	34.9	14.4	1.2	101.1	123	107	166
1999	38.8	14.1	38.1	16.7	3.0	110.7	119	109	153
2000	42.2	15.8	41.6	18.4	5.5	123.5	115	111	147
2001	39.5	15.2	39.4	17.0	5.1	116.3	112	111	139
2002	39.8	14.9	43.5	18.1	4.6	120.9	111	110	132
2003	41.5	15.2	44.9	18.4	5.8	125.8	108	109	125
2004	44.2	16.4	49.4	19.0	8.0	136.9	106	109	120
2005	45.8	17.8	51.1	19.2	11.0	144.9	103	108	114
2006	45.6	18.7	53.6	19.4	15.3	152.6	102	107	110
2007	41.5	19.2	54.4	19.1	19.9	154.2	102	105	107
2008	34.4	18.0	55.7	17.6	22.7	148.5	101	103	104
2009	24.8	13.8	51.5	14.6	23.0	127.8	100	100	100
2010	24.1	14.1	60.4	16.0	26.9	141.4	99	96	98
2011	22.2	14.2	62.9	16.3	33.2	148.8	97	94	96
2012	20.4	13.1	69.3	16.8	38.2	157.9	97	92	96
2013	18.8	12.5	70.1	16.9	44.8	163.1	96	90	96

Table 4: Global Advertising from 1980 to 2013

Year	Real Advertising Expenditures, 2009 U.S. \$						Mean Media Prices (Base, 2009 U.S. \$)			Share of Global Advertising Imputed
	Newspapers	Magazines	TV	Radio	Internet	Total	Newspapers/Magazines	TV/Radio	Internet	
1980	31.8	13.2	45.7	15.5	-	106.2	92	34	-	15%
1981	30.3	12.5	48.8	16.8	-	108.4	99	34	-	16%
1982	27.8	11.6	52.4	18.0	-	109.9	109	35	-	15%
1983	30.4	11.6	59.9	19.8	-	121.7	115	35	-	13%
1984	30.9	12.2	67.0	22.7	-	132.9	123	35	-	12%
1985	32.8	12.5	69.5	23.8	-	138.6	126	36	-	12%
1986	36.4	13.7	77.0	25.0	-	152.0	133	39	-	11%
1987	45.0	16.6	87.8	26.4	-	175.9	132	43	-	6%
1988	50.6	18.8	94.4	27.8	-	191.5	131	46	-	6%
1989	53.6	20.3	95.8	27.9	-	197.6	129	48	-	7%
1990	57.2	22.2	97.1	27.6	-	204.2	129	52	-	7%
1991	55.9	21.9	95.6	26.3	-	199.7	131	55	-	7%
1992	58.6	23.4	106.2	27.0	-	215.2	131	57	-	6%
1993	57.0	22.5	108.6	28.8	-	216.9	129	55	-	7%
1994	61.5	23.5	120.4	31.2	-	236.5	132	56	-	6%
1995	68.3	26.5	136.6	33.8	-	265.3	132	58	-	6%
1996	71.7	28.0	151.6	37.0	-	288.6	130	56	190	4%
1997	74.9	29.9	158.9	39.8	0.1	304.1	127	55	138	5%
1998	79.2	32.0	171.6	44.5	0.7	329.0	124	53	125	4%
1999	84.9	31.9	182.1	50.5	4.6	354.0	120	52	112	4%
2000	94.3	35.1	202.1	55.3	10.7	397.5	114	53	91	2%
2001	87.6	33.7	193.9	52.6	11.0	378.8	110	51	80	3%
2002	88.8	33.7	215.9	57.9	11.2	407.6	108	49	74	2%
2003	98.7	37.3	235.7	60.9	16.4	449.0	105	49	67	2%
2004	111.2	42.0	267.7	65.1	24.5	510.5	103	50	64	3%
2005	118.1	46.2	288.6	68.3	35.6	556.9	100	49	63	3%
2006	121.5	48.5	312.9	71.8	55.8	610.4	99	48	62	3%
2007	127.7	52.5	341.2	74.8	79.0	675.2	97	48	61	2%
2008	123.1	52.7	366.0	74.4	100.7	717.0	96	47	57	2%
2009	101.6	41.2	346.8	66.8	113.3	669.7	93	45	52	2%
2010	106.7	42.8	418.3	75.6	145.0	788.3	91	43	49	2%
2011	110.5	44.2	455.9	79.3	193.9	883.7	89	42	46	2%
2012	104.3	41.0	491.2	84.8	227.7	949.0	86	40	45	2%
2013	96.5	38.0	506.7	87.2	273.8	1,002.2	86	39	44	2%