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Aggregate Advertising Expenditure in the U.S. Economy: Measurement and Growth Issues in the Digital Era

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Aggregate Advertising Expenditure in the U.S. Economy: Measurement and Growth Issues in the Digital Era

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ABSTRACT

The two components of the advertising industry – the creative sector that develops and produces messages, and the communications sector that transmits messages via various media – have each been greatly affected by advances in creative design and communications technologies. As the media composition of advertising has changed in the last century for both local and national advertising – from newspapers, outdoor and radio advertising to network and cable television, and most recently to internet and digital media – so too has been transformed the very concept of advertising, its functionality and its measurement.

*This monograph is dedicated to the memory of Robert J. Coen, Senior Vice-President, Interpublic Group. Mr. Coen was acknowledged to be Madison Avenue's "Chief Forecaster" and admired as the dedicated curator of McCann-Erickson's historical database on U.S. advertising expenditures. Mr. Coen passed away on November 18, 2016.

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We compare four sources of annual nominal U.S. aggregate advertising expenditure data – from the public sector Internal Revenue Service and the U.S. Census Bureau Survey of Service Industries, and the private sector McCann-Erickson and Magna Global advertising agencies – that are available over various time periods. In nominal terms, we estimate the elasticity of advertising expenditures with respect to Gross Domestic Product, and find that this elasticity appears to have increased substantially beginning in the late 1990s – from about 1.4 to 1.9. The timing of this structural break coincides roughly with the decline of print, radio and network and cable television, and the dramatic increase in digital and internet-based advertising.

To understand the forces underlying this structural break in nominal advertising expenditures, data on media-specific advertising prices are needed, thereby converting nominal to real advertising. However, currently annual U.S. Bureau of Labor Statistics Producer Price Index data on digital and many other advertising media prices are only available beginning in 2010. The availability of media-specific quality-constant price indexes would not only enable researchers to trace more completely the recent impact of digital and internet advertising, but would also facilitate contemporary and longstanding issues to be addressed surrounding the measurement of advertising effects, including how variations in the durability of response to advertising across media are related to inter-media price differentials, and why heterogeneity among firms and industries may arise with respect to the procyclicality of advertising policies.[1]

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[1] This is a revision of our earlier paper that appeared under a similar title: Alvin J. Silk and Ernst R. Berndt, "Aggregate Advertising Expenditures in the U.S. Economy: What's Up? Is it Real?" Working Paper 28161, Cambridge, MA., National Bureau of Economic Research, December 2020.

1

Introduction

Appearing at an Interactive Advertising Bureau (IAB) conference in 2005, Bill Gates reportedly was asked "Why is online advertising growing so fast?" In his oft-quoted response, he proclaimed that "Well, when you think about it, the future of the advertising is the Internet."[1] Gates proved to be prescient in the sense that post-2005, total outlays for digital advertising in the U.S. continued to rise at double digit growth rates, with the exception of 2009, the year of the Great Recession. Paradoxically, early in 2014 an article appearing in *Bloomberg News* proclaimed that "Looking at data since the 1920s, the *U.S. advertising industry has always been about 1 percent of U.S.GDP*". The article further maintained that history revealed that new media (radio, television, and the Internet) followed a "predictable" growth pattern: five years of "rapid (but declining) growth rates," after which "growth rates steadied," "matching" that of the U.S. economy. Hence, the *U.S. advertising is an industry where "the pie is not growing . . . The easiest way to make more money is to steal larger slices of the pie."*[2]

[1] See Phillipson (2016).
[2] Chemi (2014). Italics added.

By 2016, digital advertising had supplanted television as the medium with the largest share of U.S. total advertising receipts earned by media suppliers.[3] Nonetheless, later in that same year a report emanating from a Wall St. brokerage firm presented data indicating that total U.S. advertising as a percentage of GDP was declining.[4] More recently, in 2019 it was reported that the "*growth in the U.S. advertising market has been unable to maintain its historical trend of growing in lockstep with gross domestic product, equating to approximately 2% of GDP*".[5] Relating the dramatic growth in digital's market share to growth in the size of the total advertising market, Wieser recently observed that "*Deceleration was always inevitable* for one core reason: there is only so much growth to be had."[6]

Taken together, these periodic reports and observations from a wide variety of sources paint an apparently inconsistent and confusing picture of the evolution of the U.S. advertising and marketing services industry. Perhaps the most puzzling feature of that seemingly disjointed and incomplete view of the industry is the proposition that the rapid growth of digital advertising has occurred over a period during which the share of U.S. economic activity (as measured by GDP) represented by total advertising expenditures has been in decline. Such a development that, if substantiated, would represent a striking departure from what previously had been regarded as a stable, long-term condition. Notably, after reviewing the historical data on U.S. advertising spending 1925–1999, Galibi [2001 and the references cited therein] concluded: "the share of advertising spending in total economic output (GDP) has been roughly constant long term" (p. 1)–"overall US advertising spending as a share of GDP was 2.6% in 1925 and 2.4% in 1998" (p. 7). Earlier, Telser (1968) discussed evidence of the "remarkable stability" of this relationship drawn from both the U.K. and U.S. economies. It bears noting that over the period since the launch of digital media in 1996 through 2018,[7] the U.S. economy has experienced two full business cycles, one of eight

[3] Letang and Leszega (2017), Magna Global (2015).
[4] Juenger *et al.* (2016).
[5] Baine (2019, p. 4). Italics added.
[6] Wieser (2019, p. 1). Italics added.
[7] As noted in Internet Advertising Bureau (2019, p. 11).

months in 2001 and the Great Recession of 18 months in 2008–2009.[8] Moreover, the digital transformation has not only led to an extensive overhaul of the methods used to measure aggregate advertising industry spending, but also to an ongoing program of research and revision of the measurement of GDP, including the treatment of advertising in the U.S. system of national accounts and its representation/inclusion in GDP.[9] If stability in the advertising share of GDP has persisted (in either current or constant dollars), it is truly a remarkable phenomenon. But is such apparent stability a mirage?

The U.S. advertising industry remains in the throes of change as it seeks to adapt to the far-reaching, but still unfolding effects of the digital disruption that has already transformed not only the media habits (Coyle and Nakamura, 2019) and purchasing behavior of consumers (Goldfarb and Tucker, 2019) but also the distribution and advertising strategies firms pursue and how those activities are organized and managed (Burton, 2009, Evans, 2008, 2009).

In light of the set of contradictory considerations recounted above, the fundamental question to be addressed here is: Does the U.S. advertising industry have a growth problem, a measurement problem, or both?[10] To address this question, we assembled a database of time series measures of annual aggregate advertising spending in the U.S. spanning the period 1960–2018. This period encompasses almost six decades of U.S. economic history: 36 years preceding the launch of the digital advertising in 1996 and 22 years of after that event.

The entry of digital advertising into the U.S. market for media advertising in 1996 turned out to be a major discontinuity in the system for tracking aggregate advertising expenditures in the post-World War II U.S. economy and resulted in 2009 in the replacement of the existing system which relied primarily on nominal measures (current $) of advertising expenditures made by firms (i.e., sellers of goods and services) to one that is based on the advertising revenues of media suppliers. The source of both of these time series was McCann-Erickson

[8]National Bureau of Economic Research (2016, p. 1).

[9]On this, see, for example, Diewert and Fox (2020).

[10]This framing of the issue was suggested by the title of the paper by Byrne *et al.* (2016).

(MCE) and later Magna Global (MG), both units of the Interpublic Group of Companies (IPG) which had long served as the official provider of media advertising expenditure for the federal government that was published in the annual editions of the *Statistical Abstract of the United States*.

This shift in the source of the aggregate advertising expenditure data was also accompanied by a difference in the level of prices between what advertisers paid for purchases of media space and time and what prices media suppliers charged intermediaries for media space and time, where the difference represented the commission the intermediary (advertising agency) earned on sales of media space and time to his/her clients, i.e., firms advertising goods and services to target markets. Figure 3.3 plots the time series of nominal aggregate advertising spending measures employed in this study. The separation of the advertisers and media supplier expenditure curves from 1980–2018 serves to highlight the difference between advertiser and media supplier price levels discussed above.

Note that this discontinuity in measurement of aggregate advertising spending occurred in 2009, 13 years after the initiation of digital advertising in the U.S. Fortunately, in launching the media supplier-based measurement system in 2009, the service provider MG also simultaneously released estimates of that series "backcasted" for the preceding period, 1980–2008, thereby establishing an extended time series of observations when the advertiser and media supplier series overlapped, albeit with the former series having been created post hoc. Unfortunately, it turns out that coincidental with the elimination of the nominal advertiser-based aggregate spending data series in 2009, the set of media advertising price indices that had long accompanied the spending data was also terminated, thereby eliminating the source of the information required to adjust nominal advertising expenditures for changes in current media prices and to estimate real advertising outlays, measured in constant dollars. However, in that same year (2009), the Bureau of Labor Statistics (BLS) introduced a set of price indices for various advertising media; these are discussed in Section 4.

By way of a preview of what follows, we find evidence that over the period 2000 through 2018, nominal aggregate advertising spending in

the U.S. as a share of nominal GDP has been falling. This declining share manifests itself in measures of firm advertising expenditure as well as in the advertising revenues of media suppliers (Figure A.1). While the period analyzed precedes the onset of the pandemic (2019), it includes two full business cycles – one of eight months in 2001 and then the Great Recession of eighteen months in 2008–2009. With these conditions in mind, we then proceed to conduct a detailed econometric analysis of the patchwork of nominal measures of aggregate adverting spending and nominal GDP. We find that the elasticity (or sensitivity, measured in percentages) of advertising with respect to nominal GDP appears to have increased substantially beginning in the late 1990s—from about 1.4 to 1.9. We further show that nominal aggregate advertising spending has become more responsive to changes in real GDP and GDP price inflation. As Jorgenson (2001) has documented: "A substantial acceleration in the IT price decline occurred in 1995, triggered by a much sharper acceleration in the price decline of semiconductors in 1994" (p. 1). Finally, we consider the implications of ongoing developments in the management of advertising campaigns and pending public policy issues surrounding controversial digital advertising practices for how advertising's macroeconomic role may evolve in the future. We stress the development of media-specific and aggregate media mix prices indices as being the critical next step in advancing understanding of the sensitivity of aggregate spending on advertising to cyclical and secular shifts in total economic activity and the components thereof.

The monograph is organized as follows. We begin in Section 2 with some historical background on the twin problems of defining advertising in the face of its ever changing boundaries and measuring its output as a service industry. Section 3 sketches the vertical structure of the U.S. advertising industry and describes the set of four time series we have assembled that measure nominal aggregate advertising spending by advertisers and the related revenues of two sectors who function as service providers to advertisers – advertising agencies and media firms. Trends in sector revenues and mix of major advertising media utilized are discussed along with the share of nominal GDP that aggregate advertising spending represents. Section 4 reviews the media price indices available from private sector sources and the BLS.

Section 5 presents the double log constant elasticity model that serves as the conceptual framework underlying our analysis of the relationship of nominal aggregate adverting spending to GDP. Section 6 reports extensive analyses of autocorrelation and partial autocorrelation coefficients calculated in order to assess whether our measures of nominal advertising spending exhibit stationarity and guide our choice of the order of moving average autoregressive function specifications. Section 7 presents our results indicating that a structural shift in the sensitivity of nominal aggregate advertising to GDP occurred around the turn of the century when, in nominal terms, aggregate ad spending became more responsive to not only changes in nominal GDP but also to changes in real GDP and to changes in GDP inflation. Chow tests of the null hypothesis of parameter stability over selected years in the late 20th century and early 21st century are also reported. Section 8 discusses implications of changes in the management of advertising campaigns accompanying the ascendancy of digital media and the resolution of public policy issues surrounding digital advertising practices. Section 9 briefly summarizes our main conclusions.

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