IJEFI

INTERNATIONAL JOURNAL OF
ECONOMICS AND FINANCIAL ISSUES

EconJournals
ISSN: 2146-4138

EJ EconJournals

An Analysis of Reciprocal Influence between Advertising Expenditures and Gross Domestic Product

Zeynep Bayazit[1]*, Elif Guneren Genc[2]

[1]Department of Business Administration, Istanbul Commerce University, Istanbul, Turkey, [2]Department of Banking and Finance, Istanbul Commerce University, Istanbul, Turkey. *Email: zbayazit@ticaret.edu.tr

ABSTRACT

In today's interconnected global economy, advertising plays a crucial role. Advertising, as the most effective marketing communication tool, generates informative value, consumer demand, company visibility, awareness to public, clear market positioning and economic vitality. According to most literature, a company which doesn't neglect marketing obligations and specifically advertising, tends to protect and gain market share and creates a positive brand image and reputation. The present study has explored the relationship between gross domestic product (GDP) and advertising expenditures (ADspend) according to the development levels of countries. This relation has inspected with using Panel Granger Causality Test, which reformed by Dumitrescu and Hurin (2012). After that, the study has focused on establishing whether there is a cointegration relationship between GDP and ADspend in the selected groups of countries with different types of development levels.

Keywords: Advertising, Advertising Expenditures, Panel Data Models
JEL Classifications: M37, O57, C23

1. INTRODUCTION

Most companies spent billions of dollars to advertising across all industries and media environments. As any company may expect, advertising to provide information, stimulating purchasing behavior, changing the spending among substitute products, encouraging greater economies of scale in the production, creating profitability by influencing market share and adopting to new technologies timely. Advertising also boosts competition, raises innovation for higher quality outputs and it accelerates the growth of businesses. Notwithstanding, advertising's role has also been criticized for ineffectiveness, wastefulness for inflating prices paid for goods, encouraging nonessential investment, helping leading companies to maintain their market position and reinforcing social and psychological problems (Pollay, 1986; Bughin and Spittaels, 2012).

Among all positive and negative factors, general belief of most scholars is that advertising generates new business activities which has exalted considerable percentage of growth in gross domestic product (GDP). Since, Jones (1985) and Chang and Chan-Olmsted (2005), find a positive but not flawlessly correlated relationship between GDP and advertising expenditures (ADspend), it is rational to point that GDP goes shoulder to shoulder with rising ADspend but varies upon factors especially how developed a country is. Advertising embraces a major part of the economy. In the United Stated (US) it is estimated to be >2% of GDP, and in other developed countries this account of advertising intensity is not less than US (Driver, 2017). According to Deloitte (2017) the economic benefit of advertising is: "Every euro spent on advertising is approximately adds an additional seven Euros to GDP" (Deloitte, 2017).

2. LITERATURE REVIEW

A country's level of economic development is an important factor for marketers to adjust their strategies accordingly. Advertising-

as a tool of marketing communication factor - is a valuable marketing input for companies. Advertising commonly influences the price elasticity of a given good, creating a proliferative consumption effect. The fundamentals to define advertising are that is (1) paid, (2) non-personal, (3) has an identified sponsor, and uses, (4) mass media and new technologies, and, (5) intend to persuade or influence (Richards and Curran, 2002). Companies that declare a market share from the growing pie of the economy, most commonly spend a fixed percentage of sales in advertising and other communicative tools to inform customers, to stimulate demand, to differentiate products and services and to lead consumers to purchase.

Pesavento and Marques, (2016); Guenther and Guenther (2018); Belch and Belch (2011) underline the economic benefit of advertising as: The advertising increases the consumption and promotes the economic growth. Advertising also develops a competitive environment between the producers and improves the life standards.

According to Advertising Forecast (2016), microeconomic theory suggests that if all other factors to be equal, it is expected that the increase in national income will lead to an increase in marketing expenditures, including advertising. Most academic studies suggest that the relationship between GDP growth and ADspend varies across countries, market orientation, media and time Chang and Chan-Olmsted (2005); Hyman and Marthur (2005); Kopf et al. (2011); Ozturan et al. (2014) (Austin et al., 2016). Since, Wurff et al. (2008) point that GDP goes hand to hand with rising ADspend that when ADspend in the economy increases as the national income increases, this leads to higher economic growth supported by higher level of advertising Kopf et al. (2011); Wurff et al. (2008). Thus, increased level of advertising not necessarily increase the GDP growth due to the use of advertisement resources. ADspend is a gross dimension of all media ADspend in a specified country such as radio, print media, television, outdoor and Internet-traditional displays (such as banners), online video and social media are the driving forces of Internet ADspend - (Kopf et al., 2011. p. 9); (Barnard, 2018).

According to Zenith Media report, in 2017 internet advertising caught up advertising on traditional television and it estimates approximately 37.6% of total global ad expenditure. By 2020, Internet ads are expected to account 44.6% of the global ADspend (Barnard, 2018). Timeless online ability encourages consumers to access online contents more frequently through mobile devices rather than desktops. This substantial increase in smartphone usage becomes a primary point of access to all digital services, content but especially display advertising. Greenstein (2017) states that although it has commonly assumed that the rise of Internet technology has improved GDP, its rigidity is especially about free services. He discusses that if any online service or application lacks a price, it is hard to estimate its worth. So, anything with no price produces no revenues therefore as value nothing contributes to GDP. Although there is challenge of free economy versus traditional economy, the increase in advertising revenue triggers the economic production which supports the living of humanity doesn't change much. The bottom line is, findings of scholars show

that from broadcast radio to television ad revenues have risen and fallen, with cable tv to online advertising ad revenues have risen enough to generate economic growth in total. Nevertheless, online and offline advertising create a synergy in between to make them complement (Lambert and Pregibon, 2008).

According to Wurff et al. (2008), there is a natural tendency between ADspend and high income economies. ADspend are related to the size of economy that in high income economies ADspend is tended to be larger. They also conclude that especially newspaper ADspend depend more strongly on economic development than other media. Their study confirmed that radio, television (and cinema) advertising spends are relatively insensitive to economic change. Zentner (2012) examines whether the Internet reduces ADspend for traditional media outlet. His study indicates that Internet doesn't a threat to all traditional media but, it does reduce the expenditures on newspaper, magazines and television (Zentner, 2012). Digital media, as an advertising category, has expanded recently that it is considered to be less expensive than the traditional media. Companies, with innovative vision, are more attracted to online channels because recent surveys' findings confirm that they are more effective than traditional media (Bughin and Spittaels, 2012). Specifically, the shift of consumer's interest to online media especially for news and entertainment has affected the companies advertising strategies. Kopf et al. (2011) focus on advertising spending with a different approach. According to them, advertising is used to introduce new innovative products and hence level of ADspend may be a variable and a significant effect for innovations in an economy. Their study contributes to literature that ADspend are related to economic growth and also, they bring economic growth (Srinivasan et al., 2009).

Some scholars have discussed that in an economic instability environment, the companies which increase their ad spending experience higher sales, market share and earnings rather than the companies which cut back on advertising costs to survive the economic turbulence. (Picard, 2001); (Tellis and Tellis, 2009); (Deleersnyder et al., 2004). Park and Jang, (2015) implicate that in economic contraction periods, both short and long-run advertising has more effective than in expansion periods. The growth of sales of a company might increase in economic turbulence depending on maintained or increased advertising activities. For example, during the 2001 economic crisis in Turkey (as one of the developing countries), Procter and Gamble (P and G) reduced their packaging costs to increase profit. The company decided to share the profit with consumers through price reductions. And they supported their packaging action strategy with heavy advertising. This susceptive behavior of the brand to economic challenge has led a rapid growth in their market share (Ozturan et al., 2014). The distinction of advertising-as-expense versus advertising-as-investment influences brand managers' perception of advertising's role depending on company's market orientation. Market orientation directs managers more in creating and maintaining value for customers. Therefore, in market-oriented view, managers' use of effective advertising strategies lead sustainable positive company performance which occasionally a reason to an increased GDP (Kumar et al., 2011).

3. DATA AND ECONOMETRIC METHODS

In the study, GDP and ADspend of 71 countries have complete data from 2004 to 2017 period[1]. Since developed and developing countries have differences in the sense of especially economic size, their total advertisement expenditures would be different as well. Therefore, countries were grouped as "high income", "upper-middle income" and "low income" based on the country classification of World Bank. All analyses were done separately for 39 countries which are included in high income country class, 22 countries in upper-middle income country class and 10 countries in low income country class, their status were put forward neatly according to income groups and the differences were tries to be understood. Descriptive statistics which were made through logarithmic of variables can be seen in Table 1 (Appendix I).

When Table 1 is analyzed it was determined that the highest GDP and ADspend value belongs to USA for the year 2017 (13.28, 5.29) from high-income country group, the highest ADspend value belongs to China for the year 2017 (4.93) from upper-middle country group, the lowest ADspend value belongs to Moldova for the year 2014.

The study was carried out with panel data set since different country groups were analyzed between 2004 and 2017. One of the panel data model assumptions is cross-section dependence. Cross-section dependence is commonly observed in panel data sets in which countries are especially analyzed because a shock for any of the countries has impact on other countries as well. Friedman (1937), Frees (1995, 2004) and Pesaran (2004) tests were used to test cross-section dependence in panel data sets. Pesaran (2004) and Friedman (1937) test can be used for N>T while Frees (1995, 2004) can be used for any occasion. Since there are 39 countries in high income country class, 22 countries for upper-middle income country class and 10 countries in low income country class and 14 years (T) covering 2004-2017 years, only Frees (1995, 2004) test was used for the country group included in low income class.

The conclusion with respect to the existence or not of cross-sectional dependence in the errors is not altered. The results show that there is enough evidence to reject the null hypothesis of cross-sectional independence this is shown in Table 2.

---

1   GDP data were taken from World Bank's "World Development Indicators" database, total advertisement expenditures (ADspend) data were taken from "Advertising Expenditure Forecasts" formed by Zenith The ROI Agency (Austin et al., 2016).

Table 1: Descriptive statistics of variables

Countries	Obs	Mean	Standard error	Min	Max
High income					
LGDP	546	11.49	0.67	10.08	13.28
LADspend	546	3.13	0.86	1.01	5.29
Upper middle income					
LGDP	308	11.21	0.71	9.55	13.07
LADspend	308	2.9	0.72	1.21	4.93
Low income					
LGDP	140	11.01	0.74	9.41	12.38
LADspend	140	2.55	0.76	0.77	3.94

LGDP: Logarithmic gdp, LADspend: Logarithmic total advertising expenditure

Since the assumption that these three country groups have cross-section independent distribution is rejected, Cross-Sectionally Augmented Dickey-Fuller (CADF) stationarity test Pesaran (2004, 2007) was used which is in general factor model form and which is among 2. Generation unit root tests considering cross-section dependence test. CADF test considers spatial auto-correlation, it can use lag cross-section averages of ADF regression and its extended version and in this way the first difference of regression is to eliminate correlation between units.

CADF regression can be explained as,

$$\Lambda y_{it} = \alpha_i + \rho_i^* y_{it-1} + d_0 \overline{y}_{t-1} + d_1 \Lambda \overline{y}_t + \sum_{j=0}^{p} d_{j+1} \Lambda \overline{y}_{t-j} + \sum_{k=0}^{p} c_k \Lambda \overline{y}_{\dot{Y},t-k} + \varepsilon_{it}$$

(1)

Here, $\overline{Y}_t$ is the average of all N observations according to time t. Delayed cross-sectional averages and existence of first-order calculates correlation between units through a factor structure. If there is auto-correlation in error term or factor, regression was extended by including first-order delayed differences of y_{it} and $\overline{Y}_t$ if when the regression is univariate.

Extension degree can be chosen with a criteria of knowledge through successive tests.

Table 3 consists of Pesaran CADF test results for LGDP and LADspend variables for all groups of countries. According to t-bar and Z(t-bar) statistics, these variables fail to reject zero hypothesis for stability thereby the variable aren't stable on surface however when the first differences were analyzed, they considered to be stable.

In causality literature there are four panel causality tests proposed for Panel VECM (2008), Coining and Pedroni (2004), Emirmahmutoglu and Kose (2011), Dumitrescu and Hurlin (2012). Causality tests proposed by Dumitrescu and Hurlin (2012) and Emirmahmutoglu and Kose (2011) considers cross-sectional dependence. When heterogeneity is not considered, results taken from causality analysis can be misleading. In the panel causality test proposed by Emirmahmutoglu and Kose (2011), variables can be stationary at different levels (Emirmahmutoglu and Kose, 2011). In the panel Granger causality test proposed by Dumitrescu and Hurlin (2012), variables should be stationary at the same degree (Dumitrescu and Hurlin, 2012, s. 1452). Also Dumitrescu ve Hurlin (2012) have shown that the test exhibits very good finite sample properties, even with both T and N small (Lopez and Weber, 2017).

In the study panel Granger causality Dumitrescu and Hurlin (2012) test was used which was developed for heterogeneous data models since there is cross-sectional dependence for both LGDP and LADspend variables and variables are stationary at the same degree.

In Table 4, the results of Dumitrescu and Hurlin (2012) panel Granger causality test were given. There was a bivariate causality

Table 2: Cross-sectional dependence test results

Countries	LGDP		LADspend	
	Fix effect	**Random effect**	**Fix effect**	**Random effect**
High income				
Friedman (1937)	316.474***	322.033***	77.201***	108.462***
Frees (1995, 2004)	15.048***	15.542***	9.444***	10.230***
Pesaran (2004)	67.152***	66.281***	12.418***	18.351***
Upper middle income				
Friedman (1937)	81.751***	80.374***	60.421***	58.416***
Frees (1995, 2004)	5.810***	5.798***	5.158***	4.933***
Pesaran (2004)	15.862***	14.461***	7.906***	7.591***
Low income				
Friedman (1937)				
Frees (1995, 2004)	1.825***	1.744***	1.432***	1.580***
Pesaran (2004)				

***,** and *indicates significance at 1%, 5% and 10% statistical levels respectively

Table 3: CADF second generation panel unit root test results

High income	LGDP		LADspend	
	Constant	**Constant/trend**	**Constant**	**Constant/trend**
Level				
t-bar	−1.328	−1.752	−1.106	−2.021
Z (t-bar)	2.248	2.857	3.520	1.344
1st diff.				
t-bar	−2.808***	−2.703***	−3.055***	−3.454***
Z (t-bar)	−6.236***	−2.642***	−7.649***	−6.718***
Upper middle income				
Level				
t-bar	−1.814	−2.137	−1.648	−1.521
Z (t-bar)	−0.399	0.513	0.305	3.095
1st diff.				
t-bar	−3.005***	−2.697**	−3.331***	−3.480***
Z (t-bar)	−5.481***	−1.829**	−6.869***	−5.108***
Low income				
Level				
t-bar	−1.670	−2.380	−1.106	−1.409
Z (t-bar)	0.116	−0.370	1.754	2.395
1st diff.				
t-bar	−3.058***	−2.759*	−3.933***	−3.770***
Z (t-bar)	−3.912***	−1.449*	−6.448***	-4.439***

***,** and * indicates significance at 1%, 5% and 10% statistical levels respectively

Table 4: Dumitrescu and Hurlin (2012) panel causality test

Countries	Null hypothesis		
High income			
High income	LGDP does not Granger-cause LADspend	W-bar	3.551
		Z-bar	11.259***
		Z-bar tilde	6.637***
	LADspend does not Granger-cause LGDP	W-bar	1.841
		Z-bar	3.716***
		Z-bar tilde	1.706*
Upper middle income	LGDP does not Granger-cause LADspend	W-bar	6.356
		Z-bar	10.216***
		Z-bar tilde	3.901***
	LADspend does not Granger-cause LGDP	W-bar	1.598
		Z-bar	0.983
		Z-bar tilde	0.754
Low income	LGDP does not Granger-cause LADspend	W-bar	3.026
		Z-bar	4.531***
		Z-bar tilde	2.594***
	LADspend does not Granger-cause LGDP	W-bar	0.855
		Z-bar	−0.323
		Z-bar tilde	−0.576

***,** and * indicates significance at 1%, 5% and 10% statistical levels respectively. Delay lengths were determined according to AIC criteria

relation between GDP and total ADspend of 39 countries which are in high income country group. The null hypothesis that total ADspend of 22 countries in upper-middle income country group and 10 countries in low income country group is not a reason of GDP was accepted but it was concluded that total ADspend was a reason of GDP.

When the difference between development levels of countries are analyzed, it is observed that total ADspend is one of the reasons of economic size in developed countries. Yet the process is different both for developing and under-developed countries. In these two country groups, ADspend are not regarded as a reason of economic size. As the development level increases, it was determined that ADspend get to have impact on economies of countries in time.

In the study, in relation with the result that total ADspend by which countries are grouped according to economic level between LADspend and LGDP is a reason for GDP; cointegration tests were used in order to analyze the balance relation in long-term despite shocks. Some of the tests are based on group-mean estimates, others on pooled estimates. Some take into account cross-sectional dependencies, while others do not. We will apply one representative panel cointegration tests: Test by Westerlund (2007). Westerlund (2007. p. 737) analyzed the existence of cointegration theory through four error correction (EC)-based statistics which enable heterogeneity and unbalanced panel structure in flexible, short and long term parameters, and work with standard errors which are resistant against correlation between units (Westerlund 2007).

According to causality relation between LGDP and LADspend, Gt, Ga, Pt and Pa test statistical values, z values probability values were given in Table 5. Ho hypothesis was rejected according to statistics apart from Ga, therefore there is cointegration relation between LADspend and LGDP.

Pesaran et al. (1999) proposed "pooled mean group estimation" (PMG) method in order to estimate both long and short term parameters together. Assuming that ε_{it} has a normal distribution, they followed maximum likelihood estimation (ML) approach. While PMG method proposed by Pesaran et al. (1999) fix long-term parameters, it enables evaluation of short-term parameters and error variance according to units. First of all probabilities are calculated for each group and panel data probabilities are formed. Then EC coefficients specific for long term with ML estimators and for groups with maximizing the concentrated log likelihood function.

T=1,2,….,T and groups i=1,2,…,N; and the dependent variable y is:

$$\Lambda y_{it} = \varnothing_i y_{i,t-1} + \beta_i' x_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Lambda y_{i,t-j} +$$

$$\sum_{j=0}^{q-1} \gamma_{ij}' \Lambda x_{i,t-j} + \mu_i + \varepsilon_{it} \qquad (2)$$

There exists a long-run relationship between y_{it} and x_{it} which is defined by:

where is the k ×1 vector of the long-run coefficients and η_{it} s are stationary with possibly non-zero means (including the fixed effects). Hence, Equation (2) can be written as:

$$y_i t = \theta' x_{it} + \eta_{it} = 1, 2, \cdots \cdots \cdots N; t = 1, 2, \cdots \cdots \cdots T \qquad (3)$$

where $\eta_{i,t-1}$ is the EC term given by Equation (3) and thus $\varnothing_i$ is the EC term coefficient measuring the speed of adjustment towards the long-run equilibrium.

When Table 6 is analyzed, it is seen that in the models formed for high income, upper middle income and low income countries; EC parameters (−0.264, −0.277, −0.377) which represent balance speed of short term deviations in further period which results from unstable series are negative and statistically significant. According to EC, unbalances formed in one period will be corrected in 26.4% for high income countries, 27.7% for upper middle income countries and 37.7% for low income countries and it will approximate to long term balance.

Long term parameters of GDP is 0.378 for high income countries, 0,877 for upper middle income countries and 0.844 for low income

Table 5: Westerlund panel cointegration test result

Countries	LADspend	
	Value	**Z-value**
High income	−4.628	−19.916***
	−4.952	2.592
	−10.672	−1.444*
	−5.313	−1.302*
Upper middle income	−8.543	−35.614***
	−7.190	0.010
	−11.489	−4.514***
	−9.103	−4.853***
Low income	−7.221	−19.307***
	−9.716	0.071*
	−3.505	1.143
	−12.084	−5.326***

***,** and * indicates significance at 1%, 5% and 10% statistical levels respectively. Optimal lag/lead length determined by AIC with a maximum lag/lead length of 3. Width of Bartlett-kernel window set to 3. We allow for a constant, deterministic trend in the cointegration relationship

Table 6: PMGE result

Countries	LADspend	
High income		
EC	−0.264***	(0.040)
Long-run coefficients	0.378***	(0.031)
Short-run coefficient	0.517***	(0.082)
Constant	−0.294***	(0.050)
Upper middle income		
EC	−0.277***	(0.065)
Long-run coefficients	0.877***	(0.045)
Short-run coefficient	0.293***	(0.102)
Constant	−1.925***	(0.468)
Low income		
EC	−0.377***	(0.107)
Long-run coefficients	0.844***	(0.071)
Short-run coefficient	0.353	(0.391)
Constant	−2.247***	(0.699)

***,** and *indicates significance at 1%, 5% and 10% statistical levels respectively. Figures beside estimated coefficients in parenthesis are standard errors, EC: Error correction

countries which is positive and statistically significant. Together with the increase in GDP, the country group which causes the highest increase in total ADspend is upper middle countries. When short term parameter is analyzed, while it is positive and significant for high and upper middle countries (0.517, 0.293), it was determined not to be a statistically significant parameter for low income countries.

4. CONCLUSION

To conclude, in order to shape a country's consumption future and GDP, the governments should form supportive policies, encourage regulatory systems, and acknowledge today's communication technologies, companies should develop innovative business models and construct an effective communication plan especially an efficient advertising budget. As countries move from industrial to information and knowledge age, it is important to understand the fundamentals of this new age for to stay ahead of the game. In most countries where consumer spending determines the future of the economy then advertising stimulates the economic growth. The most common way for a company to gain a competitive advantage in reaching the public and awaking their attention towards their products is through doing a sufficient advertising. According to the levels of development of countries, the market conditions, consumerism capacity, instability, political challenges, trading capabilities and structural shifts become prime features that have a direct effect on companies' advertising planning. Furthermore, advertising generates business activities which will continue to make a substantial contribution to the nation's economic activity. Companies who properly analyze competitive landscape and their initial position within the industry should easily turn any economic condition into their advantage. Thus, the level of ADspend is relatively correlated to how economically developed a country is. In developing countries optimal advertising level is hard to decide rather than in the developed countries. Regardless of development level of the countries, the importance of advertising is clear in their economic developments. In all conditions, it was determined that country economies have direct relationship with ADspend yet the rate of the effect might be different on country basis.

According to Dumitrescu ve Hurlin (2012) panel Granger casuality test results, our findings confirmed that there is a significant bidirectional casuality relationship between GDP and ADspend in the developed countries. The meaning of this result is as follows: Any change in GDP induces a change in ADspend as well as any change in ADspend induces a change in GDP. However, this relation results differently in the developing and undeveloped countries. The results show that, in those countries, a change in GDP induces a change in ADspend but, any change in ADspend doesn't have an impact on GDP. With the rise in development levels of countries, companies' market-oriented approach come into prominence and gaining profit with advertising is adopted as a fundamental tool of growth that their impact and importance in GDP are recognized and accepted.

According to development levels of countries and cointegration results, when the EC is analyzed, it is determined that the group of the country with the most attack in the long run balance approach from a deviation in the short term is the undeveloped countries, later developing countries and then developed countries respectively. This clarifies the fact that the developing countries have a higher rate of adaptation, while developed countries behave slower towards to market dynamics and economic changes. With respect to long term coefficient, it is determined that the countries where the change in the GDP of the countries is most effective in the long term are the developing countries. It can be said that all the dynamics affecting the economy in the developing countries have a great influence on ADspend. Regardless of any countries' levels of development, most countries clearly demonstrate the importance of advertising in their economic growth. In all cases, it is clearly defined that the country's economies are related to ADspend, but the effect ratio of a percentage varies from one to another.

Our findings may contribute valuable evidence and may serve for future researches for brand managers and scholars whose goal is to gain insights for the benefits of how to increase ADspend to generate economic growth or how to increase economic growth to give a rise to ADspend in any type of country.

REFERENCES

Austin, A., Barnard, J., Hutcheon, N. (2016), Advertising Expenditure Forecast. Zenith Optimedia.

Barnard, J. (2018), Advertising Expenditure Forecasts March. Zenith Media.

Belch, G., Belch, M. (2011), Advertising and Promotion: An Integrated Marketing Communications Perspective. New York: McGraw-Hill Higher Education.

Bughin, J., Spittaels, S. (2012), Advertising as an Economic Growth Engine: The New Power of Media in the Digital Age. Brussels: McKinsey and Company.

Chang, B., Chan-Olmsted, S. (2005), Relative constancy of advertising spending. A cross-national examination of advertising expenditures and their determinants. Gazette, 67(4), 339-357.

Deleersnyder, B., Dekimpe, M., Sarvary, M., Parker, P. (2004), Weathering tight economic times: The sales evolution of consumer durables over the business cycle. Quantitative Marketing and Economics, 2(4), 347-383.

Deloitte. (2017), The Economic Contribution of Advertising in Europe: A Report for the World Federation of Advertisers. United Kingdom: Deloitte.

Driver, C. (2017), Advertising's elusive economic rationale: Public policy and taxation. Journal of Economic Surveys, 31(1), 1-16.

Dumitrescu, E., Hurlin, C. (2012), Testing for granger non-causality in heterogeneous panels. Economic Modelling, 29, 1450-1460.

Emirmahmutoglu, F., Kose, N. (2011), Testing for granger causality in heterogeneous mixed panels. Economic Modelling, 28(3), 870-876.

Frees, E. (1995), Assessing cross-sectional correlation in panel data. Journal of Econometrics, 69, 393-414.

Frees, E. (2004), Longitudinal and Panel Data: Analysis and Applications in the Social Sciences. Madison: Cambridge University Press.

Friedman, M. (1937), The use of ranks to avoid the assumption of normality implicit in the analysis of variance. Journal of the American Statistical Association, 32, 675-701.

Greenstein, S. (2017), The value of free in GDP. Harvard Business School, 37(2), 106-107.

Guenther, P., Guenther, M. (2018), Isolating the value-relevant part of advertising spending. European Journal of Marketing, 52(7/8), 1625-1650.

Hyman, M., Marthur, I. (2005), Retrospective and prospective views on the marketing/finance interface. Jpurnal of the Academy of Marketing Science, 33(4), 390-400.

Jones, J. (1985), Is total advertising going up or down? Internatonal Journal of Advertising, 4(1), 47-64.

Kopf, J., Torres, I., Enomoto, C. (2011), Advertising's unintended consequence. Journal of Advertising, 40(4), 5-18.

Kumar, V., Jones, E., Venkatesan, R., Leone, R. (2011), Is market orientation a source of sustainable competitive advantage or simply the cost of competing? Journal of Marketing, 75, 16-30.

Lambert, D., Pregibon, D. (2008), Online Effects of Offline Ads. AdKDD/08-Proceedings of the 2nd International Workshop on Data Mining and Audience Intelligence for Advertising. p10-17.

Lopez, L., Weber, S. (2017), Testing for Granger Causality in Panel Data. University of Neuchatel Institute of Economic Research IRENE Working Paper. p1-12.

Ozturan, P., Ozsomer, A., Pieters, R. (2014), The role of market orientation in advertising spending during economic collapse: The case of Turkey in 2001. Journal of Marketing Research, 51(2), 139-152.

Park, K., Jang, S. (2015), The cyclical effect of advertising: Is reducing restaurant advertising appropriate in periods of economic contraction? International Journal of Contemporary Hospitality Management, 27(7), 1386-1408.

Pedroni, P. (2004), Panel cointegration: Asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. Econometric Theory, 20, 597-625.

Pesaran, M. (2004), General Diagnostic Tests for Cross Section Dependence in Panels. Cambridge Working Papers in Economics.

Pesaran, M. (2007), A simple panel unit root test in the presence of cross-section dependence. Journal of Applied Econometrics, 22(2), 265-312.

Pesaran, M., Shin, R., Smith, R. (1999), Pooled mean group estimation of dynamic heterogeneous panels. Journal of the American Statistical Association, 94(446), 621-634.

Pesavento, F., Marques, A. (2016), Advertising expenditures in Brazil and its connection with the international economy. Rebrae, 9(1), 43-61.

Picard, R. (2001), Effects of recessions on advertising expenditures: An exploratory study of economic downturns in nine developed nations. Journal of Media Economizs, 14(1), 1-14.

Pollay, R. (1986), The distorted mirror: Reflections on the unintended consequences of advertising. Journal of Marketing, 50, 18-36.

Richards, J., Curran, C. (2002), Oracles on 'advertising': Searching for a definition. Journal of Advertising, 31(2), 63-77.

Srinivasan, S., Pauwels, K., Silve-Risso, J., Hansses, H.D. (2009), Product innovatios, advertising and stock returns. Journal of Marketing, 62(1), 2-18.

Tellis, G., Tellis, K. (2009), A critical review and synthesis of research on advertising in a recession. Journal of Advertising Research, 49(3), 304-327.

Westerlund, J. (2007), Testing for error correction in panel data. Oxford Bulletin of Economics and Statistics, 6, 709-748.

Wurff, R., Bakker, P., Picard, G. (2008), Economic growth and advertising expenditure in different media in different countries. Journal of Media Economics, 21(1), 28-56.

Zentner, A. (2012), Internet adoption and advertising expenditures on traditional media: An empirical analysis using a panel of countries. Journal of Economics and Management Strategy, 22(4), 913-926.

APPENDIX

Appendix I: Countries included in the analysis

High income countries	High income countries	Upper middle income countries	Low income countries
Australia	Netherlands	Armenia	Egypt
Austria	New Zealand	Argentina	El Salvador
Bahrain	Norway	Azerbaijan	Georgia
Belgium	Oman	Belarus	India
Canada	Poland	Bosnia & Herzegovina	Indonesia
Chile	Portugal	Brazil	Moldova
Croatia	Qatar	Bulgaria	Pakistan
Czech Republic	Saudi Arabia	China	Philippines
Denmark	Singapore	Colombia	Ukraine
Estonia	Slovenia	Costa Rica	Vietnam
Finland	Spain	Hungary	
France	Sweden	Kazakhstan	
Germany	Switzerland	Lebanon	
Greece	UAE	Malaysia	
Hong Kong	United Kingdom	Mexico	
Ireland	USA	Peru	
Israel	Uruguay	Romania	
Italy		Russia	
Japan		Serbia	
Kuwait		South Africa	
Latvia		Thailand	
Lithuania		Turkey	