Advertising results in economic growth – A new methodological perspective

Artem Eremin – Ákos Nagy
American University in Bulgaria, University of Pécs

The present research will introduce a new methodology of analyzing advertising's impact on GDP. By juxtaposing the discrepancies in the GDP measurement with the advertising expenditures in the US, the paper will show that there is a significant relationship between GDP's growth and adspend. Granger test of causality will establish the causality running from advertising to GDP. Based on that, it will be argued that advertising should be treated as an investment in both accounting and calculation of GDP by expenditure method.

Keywords: advertising, economic growth, econometric model, Granger test of causality

THE RELATIONSHIP BETWEEN GDP AND ADVERTISING AS EXPENDITURE

Lately, there have been many works questioning the nature of advertising – economic growth relationship. Following Savitt (1988) and Kopf *et al.* (2011), it is possible to distinguish two main realms of thoughts in the field: the activists, or the proponents of marketing as a key component in economic development, and the determinists, or the opponents of the activists. Despite the elaborations of the scholars on the amount of work presented by each realm, it seems that the conclusions that show mixed attitude are the biggest in numbers.

In addition to classification, Kopf et al. (2011) with the help of expanded endogenous growth theory, proposed by Romer (1990), established the existence of a relationship between economic growth and advertising. To prevent any confusion it should be noted here that, in general, advertising in such types of studies, including the present one, refers to advertising expenditures. Among their findings, there was also a theoretical economic framework, explaining the channels in which the relationship can manifest itself. The authors admitted that their work was only the first step and that the relationship should be further analyzed.

The work of van der Wurff *et al.* (2008) goes deeper into the analysis of this relationship. Based on the idea that advertising spending is a function of GDP they examined how the relationship was moderated. Their conclusion was that GDP and advertising do move together. At the same time, their findings do not address the question about the causality of this relationship.

Similar results are common in the field. Ashley *et al.* (1980) showed with the help of Granger test that the null hypothesis of advertising not causing consumption cannot be rejected. Koch (1971) inferred that advertising does not stimulate or impede the growth of an industry. Banks (1986) illustrated that advertising reflects a country's level

of development in addition to the productivity of national marketing infrastructures. Callahan (1986) argued that advertising only influences the distribution of goods within the national economy and there are no effects on the economy as a whole. Borden (1942) and Kopf et al. (2011) indicated that advertising is an engine of innovation, although neither of them attempted to prove the causality. Overall, the study of literature conducted by Bughin and Spittaels (2012) on behalf of McKinsey & Company concluded that in the last thirty years scholars focused more on the impact of GDP on advertising spending, and less on the impact of advertising spending on GDP.

A curious perspective was taken by Chang and Chan-Olmsted (2005). In their study they employed a principle of relative constancy, which postulates that the share of national income spent on advertising remains constant over time. Despite the criticism of the principle (Lacy & Noh 1997), it is worth mentioning that the scholars found relative constancy to hold only in seven countries among the seventy studied. Paradoxically, the principle does not strictly hold, even though the percent of sales is the most widely-used criterion for setting a budget for marketing. This means that the interplay between advertising and economic growth is far more complex.

Apparently, this lack of evident impact of advertising on the economic growth kindled the interest of scholars in the implications of advertising during recessions. For instance, Picard (2001) concluded that the recessions and advertising expenditures were related. Tellis & Tellis (2009) went further and indicated over forty studies on this matter. The authors focused on ten primary empirical studies. Seven of them found the impact of advertising on sales, market share, ROI or earnings. Three studies showed that GDP had an effect on advertising. The difference in the results of various scholars lucidly displays the difficulty of understanding the true effects of advertising. The remaining studies gave a theoretical background on the topic with the opinions ranging from one extreme to another (see Tellis & Tellis (2009) for an eloquent overview).

Nonetheless, there are some scholars who defend, or, at least, point towards the notion of the causality running from advertising to economic growth. For example, the paper published by Nayaradou (2006) examined correlations between the spending on advertising and economic growth in the USA, Japan and major European countries. He concluded that to rapidly develop, an economy needs to have higher expenditures on advertising. A report published by Bughin and Spittaels (2012) reached similar results. Looking at G20 countries, they assert that "advertising contributes significantly more to economic growth than its share of spending" (Bughin and Spittaels 2012, 2). Both works provide empirical evidence to the findings.

Of a particular use for the present research are the mechanisms of how advertising may contribute to economic growth that Nayaradou (2006) describes. Promotion of competition, increase of consumption, acceleration of the spread of innovation, and direct contribution to the GDP dynamics (2006) may seem somewhat intuitive factors. At the same time, statistical evidence, which he attaches to each mechanism, defines them as objective.

Numerous Advertising Associations also managed to capture the significance of advertising in their studies, giving a solid theoretical background with similar channels. For example, the report published for The Advertising Coalition in the US explains that advertising encourages the struggle among various firms for the market share, which induces economic activity that would not take place otherwise (IHS Global Insight, Inc., 2013). Another study stresses the benefits of advertising as a promoter and booster of competition as well as a builder of awareness for consumers (Bughin and Spittaels, 2012). Yet another research claims that advertising communicates information that stimulates the spread of innovation in

an economy (Deloitte LLP, 2013). Together, all of these studies form a strong theoretical background elucidating how advertising may encourage economic growth. Therefore, if any indication of the causality between advertising and economic growth is found, one may explain why and how such causality exists by referring to these mechanisms.

However, the major drawback of the studies on topic lies in their lack of strong empirical support. The models in much of the works that point to advertising's importance in a country's well-being are quite arbitrarily set. The methodologies applied attempt to explain economic growth through its past values in addition to certain indicators, to the selection of which no clear rule seems to be applied. For example, research compiled by Deloitte (see Irish case (2013) study and UK case study (2013)) regresses GDP per capita on the lag of GDP per capita, total hours worked, shares of trade, investment, government spending in GDP and advertising. Although the logic is clear behind such a model, the strength of theoretical background may still be questionable. Other studies that similarly attempt to analyze economic growth are forced to make a number of estimates or do not disclose their methodology altogether. These approaches seem to suffer from a lack of stringency in their methodologies.

In order to further stimulate the discussion in the field the present paper will attempt to analyze the effects of advertising on the economic growth, employing a stricter methodology. Trying to look at the significance of advertising expenditures for the economy as a whole, regardless of a country's economic performance, a new perspective on the analysis of advertising will be defended. The theory behind this approach is that the statistical error caused by the difference in GDP as computed by different methods can be reduced if advertising is explicitly included into the calculation of GDP. More specifically, the inability of current methods to capture the effects of

advertising entirely will be targeted by attempting to find systematics in the error with the help of advertising expenditures. If successful, the reason why advertising reduces the error is that in the present methods of calculations advertising expenses are not fully reflected. The channels that could be overlooked were presented above in the discussion of a theory behind advertising's impact on GDP. In line with this methodological novelty, the following hypothesis was offered: Advertising is a significant element of the investment expenditures in the economy and thus should be incorporated into both firm-specific accounting and nation-wide income computation.

MEASURING ADVERTISING AS AN INVESTMENT – INITIATIVE THOUGHTS FOR A NEW APPROACH

Unlike the other research in the field, data from only one country – the United States of America – will be used. The practical reason is the availability of data for a long period of time. Annual data from 1960 to 2012 is used in the present paper. Nonetheless, the expectations that the most curious occurrences will be happening particularly in the USA due to its economic development, and proper corporate attention to advertising are key reasons for the narrowness of the scope.

As one possibility of analyzing the collected data, the Structural Equation Modeling (SEM) was considered. However, despite its increasing popularity, particularly in the field of marketing, the model could not be applied for the present research. The main reason for that is the ambiguity of the cause-effect relationships. Raykov and Penev (2001) mention that SEM models have many potential alternatives. As noted by Nachtigall et al. (2003, 6), this implies that "testing the fit of SEM is not a test of causality". Such a limitation on research, where causal relationships are crucial, cannot be permitted. Furthermore, SEM requires big sample size (Lei & Wu 2007). This requirement is not met by the data of the present paper. It is worth noting

that SEM seems to be a useful tool for the confirmation of results of the present paper in later research with larger sample sizes.

These limitations commanded a different approach. The starting point for this new approach was a definition of an investment. The most appropriate specification for the present research was offered by Corrado *et al.* (2004). In the conference paper focused specifically on the role of the intangibles in economy as a whole, the researchers concluded: "Any use of resources that reduces current consumption in order to increase consumption in the future qualifies as investment" (Corrado et al. 2004, 32). It is important to note the causality which is implied in this definition: the future increase in consumption must be caused by the present reduction.

Based on that, in order to establish that advertising is an investment, three hypotheses need to be proved:
(Hyp. a) Advertising reduces current consumption;
(Hyp. b) Advertising increases consumption in the future;
(Hyp. c) The reduction induced by advertising must have caused the increase.

DOES ADVERTISING RESULT IN ECONOMIC GROWTH?

Proving (Hyp. a) is a straightforward task. Advertising is not free. Waterson (1992) showed that advertising expenditure (adspend) equals to around 1 percent of the GDP in the developed countries. In a more up-to-date study, O'Donnovan *et al.* (2000) indicate the importance of advertising through the cost that it brings which is reflected in the national income. Additionally, the reality of the costs associated with advertising can be demonstrated through the works criticizing high costs of advertising. For instance, Blankley (2007, 98) argues that higher spending on advertising, in comparison to research and development spending – which is another important intangible – can result in a "generation of sales rather than knowledge". Kopf *et al.*

(2011) distinguish another two broad groups of skeptics: those who believe that advertising inflates the prices; and those who think that it causes non-negligible psychological costs. Borden (1942) gives a summary of the costs associated with the advertising and its effects on prices. In any case, it is clear that advertising employs resources which could be used to consume. One may conclude that (Hyp. a) is proven here.

To prove (Hyp. b), a model was developed using multivariate linear regression analysis.

The model focused on six variables: consumption expenditure, investment expenditure, government spending, net exports, GDP and advertising spending. The former four represent the monetary expenditures by four major groups in the economy: households, businesses, foreigners and the government. The latter two apply to the gross domestic product as measured by expenditure approach and total adspend in the US, respectively. Data on each variable was taken from: Federal Reserve Economic Data (Gross Private Domestic Investment (GPDIA), 2013; Personal Consumption Expenditures (PCE), 2013; Federal Government Expenditures & Gross Investment (FGCEA), 2013), World Bank (2013), Statistical Abstracts of the United States in 1979, 1990, 2000 and 2012 (United States Census Bureau, 2012) as well as U.S. Historical Statistics, Colonial Times to 1970 (United States Bureau of the Census, 2011).

The nucleus of the study originates from the idea that computing GDP by expenditure method should give results closely approximating GDP as measured by production method. The GDP as measured by expenditure method can be defined as (E1):

$$Y_t^E = C_t + I_t + G_t + NX_t, \quad (E1)$$

where Y_t^E is GDP as measured through expenditure approach; C is consumption expenditure; I is investment expenditure; G is government spending; and NX is net exports with subscript t representing the given year.

A proviso should be made with respect to the data. Firstly, the data on advertising spending was taken from the US Bureau of Census. Adspend refers to all types of advertising: from outdoor through broadcast to print and digital. Secondly, because the discrepancies between two approaches to measuring GDP play a determining role in the present research, it is crucial to underline that the left-hand side of E1 should be approximately equal to GDP, as measured by production method (GDP.P); whereas the right-hand side equals to GDP, as measured by expenditure method (GDP.E). The data for the former was taken specifically from the website of the World Bank; the latter is calculated with the help of E1. All of the data was presented in billions of current US dollars.

Due to statistical errors, it is unlikely that GDP.P will equal GDP.E. This practical inequality among the different approaches to measuring GDP is an issue for the national statisticians without any clear answer as to how to make the numbers match in the end. Nonetheless, the present research will try to find some systematic discrepancies, which can be explained by advertising. This implies the following (E2):

$$Y_t^P = Y_t^E + \varepsilon_t, \qquad (E2)$$

where P and E denotes the approach used to calculate GDP.

Plugging in E1 (E3):

$$Y_t^P = C_t + I_t + G_t + NX_t + \varepsilon_t. \qquad (E3)$$

Additional modifications were needed in order to build the model in accordance with the proper econometric assumptions.

In similar types of investigations it is a common practice to express variables in natural logarithms. At the same time, NX can take on negative values, which renders the transformation impossible. To deal with this problem and maintain uniform definition of variables, a value of $780.7 billion was added to both sides of the equation E3.

As for the advertising variable, a special note is in order. It is certain that there are two elements in total advertising expenditures. One part of those has long-term effects and is thus a stock with a positive effect on GDP. The other part is everything else – the cost of that investment. This is a share of national income that could be spent on something else (or saved). This dual nature of advertising expenditures speaks in favor of (Hyp. a) and (Hyp. b) as long as each part is non-negligible. Yet, it is difficult to approximate the shares of those elements and they may change over time. Hence, the variable of advertising expenditures in its entirety was included in the model. This provided a control for advertising expenditures in all of the investigated variables. The ultimate effect on the economic growth is therefore a net of the two opposing effects just described.

The logarithms of each variable were then converted into a stationary form by taking their first differences. Stationarity was ensured by appropriate Augmented Dickey-Fuller tests, performed with the help of STATA (StataCorp., 2011). To control for the lagged effects, the significant lags of the dependent variable were included. Importantly, all the significant lags of advertising were also added to the model to enable future analysis. At the same time, the lags of C, I, G and NX were not included. According to E3, the lags of Y_t^P must already contain each of these four variables.

Furthermore, the lags of Y_t^P include the error term. Due to that, the statistical significance of any other variables in the model is adjusted for the discrepancies between Y_t^P and Y_t^E in the previous periods. In other words, this enables one to avoid the uncertainty about including the advertising into the previous calculations of Y_t^P. An example explains this logic. If advertising is a significant component in the calculation of GDP – a statement, whose validity can only be checked by the final model – one would need to include advertising into the lags of Y_t^P. This would distort the model that

showed that advertising had to be included. So, one would encounter a loop in the methodology. Nevertheless, the inclusion of the error term presupposes that in the calculation of the Y_t^P all the relevant information about Y_{t-1}^P is employed, regardless of the ways it was approximated in the previous periods. Consequently, this strategy enables control over the last discrepancies in measurements, leaving only the error caused by the approximation in the given interval t as the error term. Finally, the trend term t was included to capture overall tendency of variables to grow. All of these adjustments resulted in the final equation E4 of a general form:

„Based on the results, it can be concluded that there is a positive statistically significant relationship between the change in adspend in the previous year and the change in Y_t^P (economic growth) in the given year controlling for the factors suggested by the macroeconomic model E1 (p-value=0.000)."

$$\ln \frac{Y_t^P + 780.7}{Y_{t-1}^P + 780.7} = b_0 + b_1 * \ln \frac{C_t}{C_{t-1}} + b_2 * \ln \frac{I_t}{I_{t-1}} + b_3 * \ln \frac{G_t}{G_{t-1}} + b_4 * \ln \frac{NX_t + 780.7}{NX_{t-1} + 780.7} + \sum_{i=0}^{t-1} b_{5,i+1} *$$
$$\ln \frac{Y_{t-i}^P + 780.7}{Y_{(t-1)-i}^P + 780.7} + \sum_{i=0}^{t-1} b_{6,i+1} * \ln \frac{A_{t-i}}{A_{(t-1)-i}} + b_7 * t + \varepsilon_t \tag{E4}$$

where subscript i is used to aggregate all statistically significant lags.

The results of the regression model are presented in Table 1. The selection of the model was based on the principles of parsimony and generosity as well as the following statistics: F-statistic, (adjusted) R-square, Akaike (AIC) and Schwarz (BIC) information criteria. Despite their statistical insignificance, G and NX were kept because they are suggested by E4. The proper tests were conducted and the necessary adjustments were applied to ensure the absence of the multicollinearity and heteroscedasticity problems.

Based on the results, it can be concluded that there is a positive statistically significant relationship between the change in adspend in the previous year and the change in Y_t^P (economic growth) in the given year controlling for the factors suggested by the macroeconomic model E1 (p-value=0.000). Although no claims are made about causality yet, it is worth noting the lagged nature of the relationship, where advertising is the lagging variable. The positivity of the relationship suggests that higher adspend corresponds to, or is corresponded by (depending on the causality), higher economic growth. The bridge between the

Table 1: STATA-generated statistics for the first model

Variable	First-differenced logged consumption	First-differenced logged investment	First-differenced logged government spending	First-differenced logged adjusted net exports	Time Variable	First lag of first-differenced advertising spending	Second lag of first-differenced GDP
T-statistic	3.56	4.97	0.69	-0.3	3.43	4.07	3.26
P-value	0.001	0.000	0.494	0.762	0.001	0.000	0.002

Source: Own model with StataCorp., 2011 to approximate regression parameters

economic growth and consumption is clear (E5):

$$C_t = C_A + mpc * Y_t^D, \qquad (E5)$$

where C_A is autonomous consumption, mpc is marginal propensity to consume, and Y_t^D is disposable income, which, of course, is related to Y_t^P. Together, the movements of adspend and GDP in the same direction, along with E5, and the lagged nature of the relationship build a strong case for accepting (Hyp. b).

Nevertheless, to finalize the proof of (Hyp. b), (Hyp. c) needs to be proven first. The series were shown to be cointegrated by Johansen cointegration test using STATA with the stationarity of the first differences and non-stationarity of the levels being ensured by the ADF tests. The presence of cointegration implies a long-term relationship between variables (Johansen & Juselius 1990). As mentioned elsewhere, cointegration distorts the results of the vector autoregression models in levels (Toda & Yamamoto 1995). Additionally, the Wald statistic under cointegration has a "nonstandard asymptotic distribution" (Toda & Phillips, 1993). That is why for the tests of the short-term relationships the variables were first-differenced.

To establish causality, Granger test was applied with the help of STATA. Preceding the test, autoregressive models were constructed for both first-differenced logarithm of Y_t^P and first-differenced logarithm of adspend. Because the long-term effects were checked before, the loss of valuable long-term information caused by first-differencing can be considered minimal. The optimal number of lags was defined by Akaike, Schwarz's Bayesian and Hannan and Quinn information criteria. The adjustment for small sample size was applied. The Wald statistics for the causality test are shown in Table 2, along with their p-values.

The autoregressive model did not control for the effects of four other variables: C, I, G, NX. The reason for that was discussed in the context of the linear regression model. The lags of first-differenced GDP.P include the lags of the first differences of these, as suggested by E1 and E2. Furthermore, the lags of GDP.P include exact statistical discrepancy from the previous periods ensuring the inclusion of all relevant information about factors not captured by E3. This reduces the crowdedness of the model while still exercising necessary controls.

The results of the test enable one to reject the null hypothesis that first-differenced adspend does not Granger cause first-differenced GDP (see Table 2). Combining this conclusion with the findings from the linear regression model yields an inference that, indeed, increases in advertising expenditures cause (in fact, Granger-cause – see Granger (1969) for author's explanation of the difference) faster economic growth. In fact, what this illustrates is that an estimate of GDP.P in period *t* using only the data on GDP.P in previous periods is worse than an estimate of GDP.P based on those lags *and* advertising expenses. In other words, the predicting power of GDP.P can be enhanced with the help of advertising. This note is made in order to show that the inclusion of advertising ameliorates both GDP.E (by reducing statistical error) and GDP.P (by increasing its predicting abilities). Returning to the results of the test, one can set a causal direction in the relationship exhibited by the multivariate linear regression model.

Table 2: STATA-generated statistics for Granger test

Investigated Causality	Wald Statistics	P-value
First-differenced logged adspend → First-differenced logged GDP.P	7.9042	0.0012
First-differenced logged GDP.P → First-differenced logged adspend	0.03931	0.9615

Source: Own model with StataCorp., 2011 to approximate statistics

With this, the increases in adspend, indeed, result in the economic growth. Using E5, one can see that increased adspend also increases consumption by increasing the disposable income. This proves (Hyp. b), whereas Granger test itself proves (Hyp. c).

The question may arise why the causality was not tested against consumption directly. The rationale for the avoidance is the effects which would be ignored in this case. There need not be a relationship only between consumption and advertising. Rather, advertising may have effects on, or be caused by, I, G and NX. Firms are interested in advertising because it influences their sales. Sales, in turn, have an impact on the investment money of businesses. Similarly, advertising may influence government spending because the government advertises, too. Finally, the globalization of the markets has led to international advertising, which, undoubtedly, impacts NX. These relationships may have a significant effect. Instead of looking at them separately, they were bundled to understand the overall importance of advertising.

Because at this point premises (Hyp. a), (Hyp. b) and (Hyp. c) can be considered proven, advertising qualifies as an investment. There are two major implications of this finding. Firstly, from the accounting perspective advertisement should be viewed as an investment, rather than an expense. Although studies showed earlier that advertising has an impact on sales, they were heavily related to advertising during a recession and the benefits of advertising because the others are advertising less (see, for instance, Tellis & Tellis (2009) or Blankley (2007)). The present work draws a conclusion about the entire economy. In the USA, advertising brings about economic growth. Secondly, advertising should be included in the calculation of GDP. If advertising, indeed, is treated as investment in the accounting, it will automatically imply that advertising should become a part of the investment component in the GDP, as measured by expenditure method. Never-theless, not only GDP.E can be improved by advertising. As suggested by Granger test, the predictive power of GDP.P, too, can be improved with the help of advertising.

CONCLUSIONS AND FURTHER RESEARCH QUESTIONS

The present research took a fresher perspective on the relationship between advertising and economic growth. By analyzing the statistical error between GDP as measured by different approaches, a strict empirical model with a strong theoretical background was developed. Based on this model, advertising was shown to be an investment that contributes to economic growth.

Hence, the economic health of an entire nation may be influenced through advertising. It appears, then, that advertising is another point where the interests of separate participants are weighed against the interests of the aggregation of these participants. Unlike other points, nonetheless, advertisement carries a substantial psychological aspect with it. Continuous irritating repetition, despite the general aversion, is an investment into people's well-being, not only into a good it aims to promote.

At the same time, the present research focuses only on the United States of America. This narrow scope allowed establishing an example of the significance of advertising. However, one case is definitely not enough to validate the hypothesized concept. Future investigation should thus include other countries with mature and maturing economies. The implications of the present paper should be tested against other nations. It is important to include long-term data for the research, too, to ensure that the effects do not coincide with technological advances which may be indirectly reflected through advertisement spending. Investigation of additional countries would also allow establishing at which stage of economic development advertising plays the most important role.

Especially curious may be the topic of the effect of global advertising on global

economic growth. Because the US has been an engine of the world development over the last decades, it may be expected that lately there has been a similar relationship in the whole world. However, this relationship may be more useful, if the effects of advertising are weighed against a country's GDP. This would enable one to capture psychological effects of advertising: Does continuous repetition of information indeed kindle favorable economic moods worldwide?

Finally, scholars can focus on computing the actual returns on advertising. It may appear problematic to create appropriate methodology for such research. Nevertheless, if the returns on advertising are clearly detected, the whole strategy of advertising would have to be re-evaluated.

REFERENCES

Ashley, R., Granger, C. W., & Schmalensee, E. (1980), "Advertising and Aggregate Consumption: An Analysis of Causality", *Econometrica*, **48** 5, pp.1149-67

Banks, S. (1986), "Cross-national analysis of advertising expenditures: 1968-1979", *Journal of Advertising Research*, **26** 2, pp.11-24

Blankley, W. (2007), "Correlations between advertising and R&D expenditures: dealing with important intangibles", *South African Journal of Science*, **103** 3/4, pp.94-8

Borden, N. H. (1942), "Findings of the Harvard Study on the Economic Effects of Advertising", *Journal of Marketing*, **6** 4, pp.89-99

Bughin, J., and Spittaels, S. (2012), *Media Entertainment and Information: Advertising as an Economic-Growth Engine*. Retrieved January 5, 2014, from McKinsey&Company: http://www.mckinsey.com/locations/Belux/~/media/Belux/FinalAdvertising.ashx

Callahan, F. X. (1986), "Advertising and economic development", *International Journal of Advertising*, **5** 3, pp.215-24

Chang, B.-H., & Chan-Olmsted, S. M. (2005), "Relative Constancy of Advertising Spending: A Cross-National Examination of Advertising Expenditures and Their Determinants", *International Communication Gazette*, **67** 4, pp.339-57

Corrado, C., Hulten, C., & Sichel, D. (2004), *Measuring Capital and Technology*, Retrieved March 15, 2014, from The Federal Reserve Board of Governors in Washington DC.: http://www.federalreserve.gov/pubs/feds/2004/200465/200465pap.pdf

Deloitte LLP. (2013). *Advertising Pays: How Advertising Fuels the UK Economy*. London: The Advertising Association

Deloitte LLP. (2013). *Advertising: An Engine For Economic Growth*. Dublin: Core Media Communications SJRQ

Granger, C. W. (1969), "Investigating Causal Relations by Econometric Models and Cross-spectral Methods", *Econometrica*, **37** 3, pp.424-38

IHS Global Insight, Inc. (2013). *The Economic Impact of Advertising Expenditures in the United States 2012-2017*. The Advertising Coalition.

Johansen, S., & Juselius, K. (1990), "Maximum Likelihood Estimation and Inference on Cointegration--With Applications to the Demand for Money", *Oxford Bulletin of Economics & Statistics*, **52** 2, pp.169-210

Koch, J. V. (1971), "Advertising and Economic Growth", *Journal of Advertising Research*, **11** 4, pp.36-9

Kopf, D. A., Torres, I. M., & Enomoto, C. (2011), "Advertising's Unintended Consequence", *Journal of Advertising*, **40** 4, pp.5-18

Lacy, S., & Noh, G.-Y. (1997), "Theory, Economics, Measurement, and the Principle of Relative Constancy", *Journal of Media Economics*, **10** 3, pp.3-16

Lei, P., & Wu, Q. (2007), "Introduction to Structural Equation Modeling: Issues and Practical Considerations", *Educational Measurement: Issues And Practice*, **26** 3, pp.33-43

Nachtigall, C., Kroehne, U., Funke, F., & Steyer, R. (2003), "(Why) Should We Use SEM? Pros and Cons of Structural Equation Modeling", *Methods of Psychological Research Online*, **8** 2, pp.1-22

Nayaradou, M. (2006), *The Value of Advertising*. Retrieved December 31, 2013, from World Federation of Advertisers: http://www3.wfanet.org/valueofadvertising/documents/WFA-UDA_Advertising&Economic_Growth.pdf

O'Donnovan, B., Rae, D., & Grimes, A. (2000), "Determinants of advertising expenditures: aggregate and cross-media evidence", *International Journal of Advertising*, **19** 3, pp.317-34

Picard, R. G. (2001), "Effects of Recessions on Advertising Expenditures: An Exploratory Study of Economic Downturns in Nine Developed Nations", *The Journal of Media Economics*, **14** 1, pp.1-14

Raykov, T., & Penev, S. (2001), "The Problem of Equivalent Structural Equation Models: An Individual Residual Perspective" In Marcoulides & Schumacker (Eds.), *New Developments and Techniques in Structural Equation Modeling*, Abingdon: Psychology Press, pp.297-321

Romer, P. M. (1990), "Endogenous Technological Change", *Journal of Political Economy*, **98** 5, pp.71-102

Savitt, R. (1988), "The State of the Art in Marketing and Economic Development", *Research in Marketing*, **4** 4, pp.11-37

Tellis, G. J., & Tellis, K. (2009), „Research on Advertising in a Recession: A Critical Review and Synthesis", *Journal of Advertising Research*, **49** 3, pp.304-27

Toda, H. Y., & Phillips, P. C. (1993), "Vector Autoregressions and Causality", *Econometrica*, **61** 6, pp.1367-93

Toda, H. Y., & Yamamoto, T. (1995), "Statistical inference in vector autoregressions with possibly integrated processes", *Journal of Econometrics*, **66** 1-2, pp.225-50

United States Bureau of the Census. (2011), *Historical statistics of the United States, colonial times to 1970, Volume 2*. Retrieved December 20, 2013, from Department of Commerce; Bureau of the Census: http://www2.census.gov/prod2/statcomp/

United States Bureau of the Census. (2012). *US Census Bureau Publications - Statistical Abstract*. Retrieved December 27, 2013, from US Department of Commerce; Bureau of the Census: http://www.census.gov/prod/www/statistical_abstract.html

van der Wurff, R., Bakker, P., & Picard, R. G. (2008), „Economic Growth and Advertising Expenditures in Different Media in Different Countries", *Journal of Media Economics*, **21** 1, pp.28-52

Waterson, M. J. (1992), "International advertising expenditure statistics", *International Journal of Advertising*, **11** pp.14-67

World Bank. (2013). *Data*. Retrieved March 1, 2014, from World Bank: http://data.worldbank.org/indicator/NY.GDP.MKTP.CD

Artem Eremin, Postgraduate Student

artem0eremin0@gmail.com
American University in Bulgaria, Blagoevgrad

Nagy Ákos tanársegéd

nagya@ktk.pte.hu
Pécsi Tudományegyetem
Közgazdaságtudfományi Kar
Gazdálkodástudományi Intézet