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The attention of a society towards corporate brand
name and its determinants within the information-
rich economy

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Abstract

Jaroslav Bukovina: The attention of a society towards corporate brand name and its determinants within the information-rich economy

Corporate reputation can be a valuable corporate asset but a complicated concept to measure. Similarly, it is difficult to identify and quantify the determinants of corporate reputation. Considering the information rich economy and cognitive limits of economic agents (limited attention), ability to identify the effective channels of corporate communication can be a significant advantage for a corporation. This paper contributes with the methodology that enables to evaluate the attention of a society towards corporations and its determinants. The paper proposes the Google's search volume for the specific corporation as a proxy for the attention of a society towards that company. To identify determinants of attention, the paper employs qualitative approaches Corporate Reputation Quotient™ and RepTrak®, that defines the dimensions of corporate reputation. Further, the paper employs Bayesian model averaging (BMA) to handle the uncertainty in a choice of particular determinants. Set of variables identified by BMA is estimated in a linear dynamic panel environment. Delivered results enable to evaluate the current channels of corporate communication with customers and its costs.

Key words

corporate reputation, limited attention, information-rich economy, Bayesian model averaging, dynamic panel model

JEL: M21, M29

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Introduction

The paper proposes the Google engine as a novel tool that enables to gauge attention of society towards the corporate brand name. Current literature stresses the need for a strong corporate brand name, necessary for value creation and competitive position at the market (Aaker, 1991; Motameni & Shahrokhi, 1998; Keller & Lehmann, 2006; Hsu et al., 2013). However, there is still missing the generally accepted approach to evaluate and quantify the value of corporate reputation (Yoo et al., 2000; Ambler, 2003; Jia & Zhang, 2013, Huang, 2015). Current literature (Huang, 2015) proposes three approaches to quantify the brand name value. 1. Fundamentals of the corporation. 2. Customers perceptions. 3. The combination of former. This paper enhances the research related especially to customers' perceptions. It proposes to employ the Google's search volume for the name of corporation as an indicator of attention and interest towards the corporate brand name. This indicator cannot provide the direct financial evaluation of corporate brand. However, it enables to track the time trend of customers' perception and measure its determinants.

The paper studies brand name perception in the information rich economy. Such an economy stands for the developed economy where technological development causes an information rich environment with the following economic consequences. Standard economic literature proposes that rational economic agents process all the available information. Further, these agents optimally allocate scarce resources. However, in line with recent knowledge in psychology and behavioral economics, economic agents are not "Homo economicus" but rather real people - Homo Sapiens with the limited cognitive ability to handle all available information (Thaler, 2000; Todd & Gigerenzer, 2003). In the context of the paper, a term "attention" stands for cognitive ability of economic agents. According to Teixeira (2014), the term attention can be described as the allocation of mental resources (visual or cognitive) to visible or conceptual objects (stimuli). Following the rational inattention theory (Sims, 2003; 2006), the attention of economic agents becomes the scarce resource. Therefore, in the information-rich economy, the wealth of information comes with the poverty of attention (Simon, 1971). In such economy, information is generated with minimal costs and attention of the consumers becomes limited with consequences in economic competition (Falkinger, 2008). Corporations became "attention seekers" competing for scarce consumer attention as it is the first level to initiate the communication with customers (Falkinger, 2008). The attention of economic agents is a new "form" of capital or currency (Teixeira, 2014).

Below methodology proposes the empirical set up to identify the determinants of attention and interest. Practical implications are focused on brand name marketing. The AIDA (attention, interest,

desire, action) model or its newer modifications, stress the significance of the attention and interest of the economic agents. Attention is a necessary part of effective advertising (Teixeira, 2014). Given the conditions of information-rich environment emphasized by cognitive constraints of economic agents, attention and interest are becoming even more crucial issues. Therefore, this paper attempts to identify determinants driving the attention of society towards corporations. This information can further serve to focus on areas with the highest impact and evaluate costs of currently employed channels (stimuli) of communication with customer (Teixeira, 2014). Further, following Teixeira (2014), there are two dimensions of attention. Intensity and duration that refers to quality and quantity respectively. The practical contribution of the paper is the recommendation of Google queries as a gauge of the quality of attention and interest that is considerably more complicated to measure in comparison to quantity (Teixeira, 2014). By nature, an economic agent needs to “make an effort” (decision) to search for the specific corporation via web engine. Specifically, this effort (decision) would not be possible if the agent is not paying an attention. This rationale follows the link between attention and effort (Kahneman, 1973). In particular, allocation of agent’s attention (mental resources) to one task reduces its cognitive ability for other tasks. Therefore, choice of an individual to search for specific corporation via Google defines the quality of attention initially driven by some determinant.

Furthermore, the paper enhances the growing research currently devoted to the analysis of online behavior of a society via web or social media data. The aim of such research is twofold. Either better understand the increasing intersections between digital and real economy or study the patterns in behavior of economic agents that were not possible to gauge in past, especially due to missing data. Example of such studies are Tumasjan et al., (2010), Sakaki et al., (2010), Choi & Varian, (2012), Saxa (2014), Siganos et al. (2014) or Sprenger et al., (2014a, b) who study various socio-economic issues varying from presidential elections to capital markets behavior. These studies employ either web searches proxied via Google queries or social media (Twitter or Facebook) feed as explanatory variables that track the behavior of a society. This paper proposes to employ the data of Google engine as the dependent variable due to its feature to represent the information demand or attention of economic agents towards particular information or object (Choi & Varian, 2012; De et al., 2011; Saxa 2014; Bukovina, 2016).

1 Methodology

1.1 Data

The paper studies 48 companies belonging to the list of the largest non-financial corporations according to market capitalization headquartered in the USA. Studied period is 2008 – 2015 on a quarterly basis. The rationale for the sample choice is the following. Largest corporations are well

known in a society. They determine (in/directly) everyday reality via several “channels” e.g. products & services, marketing, capital markets, news or social media. This “set up”, therefore, enables to study various determinants of attention and interest. Further, the USA are considered as the closest proxy to information-rich economy.

The dependent variable is the perception of corporate brand name in society proxied by volume of Google searches (queries) for the company name. Google provides this data in the publicly available database¹ that enables thematically and geographically define the specific query. In the context of the paper, e.g. the query “Coca-Cola”, is thematically defined as a company not the soft drink named as the company. Further, it is the geographically constrained only for the USA. The choice of proper explanatory variables is a considerably more complicated task. There is no generally accepted theory providing a list of determinants influencing the corporate brand. Therefore, to decrease the uncertainty in a choice of variables, the paper employs two qualitative approaches that measure corporate reputation. In particular, corporate reputation quotient™ (CRQ) (Fombrun et al., 2000) and RepTrak® (ReputationInstitute, 2017) provide 6 and 7 dimensions of corporate reputation respectively. These approaches provide a most robust list of dimensions. Table 1 presents these dimensions and variable/s that represents specific dimension. Table 2 further describes the list of employed variables, their description and sources. Not all variables are dimension specific. Variables *gdp_pc* and *users*, control for economic conditions and internet availability, respectively. Variables *industry* and *i_news* represent the “industry effect” to control for attention towards whole industry (e.g. current popularity of Technology sector). Where applicable, variables are expressed as natural logarithms.

Table 1. Dimensions of corporate reputation

| RepTrak® | CRQ™ | Variable |
|--------------------|-----------------------|-----------------------|
| Product & Services | Products & Services | rev |
| Innovation | - | tan_asset; int_asset; |
| Workplace | Workplace Environment | rights |
| Governance | Social responsibility | apay; rights tax; |
| Citizenship | | g_news |
| Leadership | Vision & Leadership | ceo |
| Performance | Financial Performance | mcap; arec; ldebt |
| - | Emotional Appeal | soc_med; bowl |

¹ trends.google.com

Table 2. List of employed variables

| Variable | Description | Source |
|------------------------------|---|---|
| Dependent variable | | |
| brand | Search volume – name of the company | Google trends |
| Independent variables | | |
| gdp_pc | Real GDP per capita | FRED (Database of St. Louis Federal Reserve bank) |
| users | Number of internet users | Worldbank |
| mcap | Market capitalization | |
| rev | Revenues | |
| sell | Operating expenses – selling and promotion costs | |
| tan_asset | Investments to property, plant and equipment | Bloomberg |
| int_asset | Investments to intangible assets | (Balance sheet; Profit & Loss statement) |
| arec | Accounts receivable | |
| apay | Accounts payable | |
| debt | Long term debt | |
| tax | Paid income tax | |
| c_news | Search volume – news about company | |
| soc_med | Search volume of the company at YouTube (proxy for social media) | Google trends |
| industry | Search volume – industry that company is part of | |
| i_news | Search volume – industry news | |
| ceo | Search volume – name of the CEO | |
| bowl | Superbowl commercial - dummy | Wikipedia |
| rights | Corporate equality index | Human rights Campaign |

1.2 Model

To further handle uncertainty in the choice of variables, the paper employs the Bayesian model averaging (BMA) approach. BMA “defines” the most probable model in the universe of models given the information in the employed variables. Specifically, BMA handles the model uncertainty via estimate of N candidate models and reporting a weighted average as the estimate of the effect of interest (Chen et al., 2011; Benito, 2015) that can be generally written as:

$$\hat{\beta}_{MA} = \sum_{n=1}^N w_n \hat{\beta}_n, \quad (1)$$

where w_n stands for nonnegative random weights (summed up to one) related to model n . Weights are given as posterior model probabilities of each model (De Luca & Magnus, 2011). Further, following De Luca & Magnus (2011), the paper employs pooled-regression given as:

$$\begin{aligned} brand_i &= \alpha + X_i\beta_i + \varepsilon_i, \\ i &= 1, \dots, N, \end{aligned} \tag{2}$$

where *brand* is the perception of corporate reputation gauged by Google queries, α is model constant and X stands for z explanatory variables given in Table 1. Therefore, X is an $n \times z$ matrix of observations and ε is the vector of disturbances. According to Table 1, there is 19 explanatory variables. Therefore, $N = 2^z$ or 262 144 possible models. The most probable model is a model with the largest posterior model probability (PIP).

The approach of De Luca & Magnus (2011) does not enable to study the dynamic relationship employing the lagged dependent variable within equation 2. Therefore, as the 2nd step, the paper employs dynamic panel linear regression performed via augmented Arellano-Bond estimator (1991), outlined by Arellano and Bover (1995) and fully developed by Blundell and Bond (1998) given in Roodman (2009). The model is defined as:

$$\begin{aligned} brand_{it} &= \alpha + brand_{it-1}\beta_1 + X_{it}^{PIP>0.66}\beta_2 + \varepsilon_i, \\ i &= 1, \dots, N; \quad t = 1, \dots, T \end{aligned} \tag{3}$$

where $brand_{t-1}$ is lagged dependent variable, X^{PIP} is $n \times z$ matrix consisting of estimates of explanatory variables in equation 2 where PIP is higher than 0.66. De Luca & Magnus (2011) suggest the PIP values larger than 0.5. The author follows a bolder threshold employed in Schneider & Yaşar (2014) that defines only regressors with odds of inclusion 2:1.

2 Results

Table 3 provides the BMA results for the full, B2B and B2C sample. Explanatory variables with $PIP > 0.66$, following the Schneider & Yaşar (2014), are employed in the estimation of the dynamic linear panel regression model. The inclusion probability of a regressor are 1 or close to 1 for the majority of variables. This pattern might be caused by missing lag of dependent variable in model specification and presence of endogeneity that is further handled via linear dynamic panel regression. Further, the BMA results imply the differences between B2B and B2C channels of communication. For B2B sample, majority of statistically significant variables is related to economic and financial performance (e.g. fundamentals). On the contrary, except economic and financial proxies, also “soft factors” like social media (*soc_med*) or CEO are statistically significant at the level of B2C sample.

Table 4 provides the results of linear dynamic panel regression given in equation 3 for the full, B2B and B2C sample. In comparison with Table 3, only few explanatory variables are significant. The author considers this to be the effect of lagged dependent variable that is significant in every studied sample.

Moreover, the estimation of equation 3 without the lagged dependent variable by fixed effects estimator provides the results similar to Table 2. These estimates are not presented in the paper due to the presence of endogeneity within the model that is appropriately handled via GMM estimator.

Table 3. Bayesian model averaging results

| brand | All | | B2B | | B2C | |
|-----------|------------------------|-------------|------------------------|-------------|------------------------|-------------|
| | Coef. | PIP | Coef. | PIP | Coef. | PIP |
| cons | -0.63 (2.06) | 1.00 | 16.97 (4.47) | 1.00 | -1.19 (3.89) | 1.00 |
| users | 0.00 (0.01) | 0.15 | 0.01 (0.01) | 0.84 | 0.00 (0.01) | 0.17 |
| gdp_pc | -0.03 (0.21) | 0.05 | -1.64 (0.44) | 1.00 | 0.10 (0.36) | 0.12 |
| mcap | 0.10 (0.04) | 0.95 | 0.01 (0.02) | 0.17 | 0.00 (0.01) | 0.07 |
| rev | 0.41 (0.05) | 1.00 | 0.20 (0.03) | 1.00 | 0.30 (0.05) | 1.00 |
| sell | 0.01 (0.02) | 0.19 | 0.09 (0.02) | 1.00 | -0.01 (0.02) | 0.14 |
| tan_asset | 0.03 (0.03) | 0.66 | -0.03 (0.01) | 0.89 | 0.08 (0.02) | 0.99 |
| int_asset | -0.13 (0.01) | 1.00 | -0.13 (0.01) | 1.00 | -0.16 (0.01) | 1.00 |
| arec | -0.07 (0.02) | 0.97 | -0.07 (0.02) | 1.00 | 0.00 (0.01) | 0.06 |
| apay | -0.16 (0.02) | 1.00 | -0.11 (0.01) | 1.00 | -0.19 (0.02) | 1.00 |
| debt | -0.05 (0.01) | 1.00 | 0.03 (0.01) | 1.00 | -0.01 (0.02) | 0.30 |
| tax | -0.11 (0.02) | 1.00 | 0.00 (0.00) | 0.06 | 0.00 (0.01) | 0.12 |
| c_news | 0.06 (0.01) | 1.00 | 0.03 (0.01) | 0.99 | 0.08 (0.01) | 1.00 |
| soc_med | 0.06 (0.01) | 1.00 | 0.00 (0.00) | 0.16 | 0.27 (0.02) | 1.00 |
| industry | 1.60 (0.11) | 1.00 | 1.21 (0.07) | 1.00 | 1.03 (0.15) | 1.00 |
| i_news | -0.16 (0.04) | 1.00 | 0.12 (0.09) | 0.73 | -0.27 (0.03) | 1.00 |
| ceo | 0.39 (0.03) | 1.00 | 0.00 (0.01) | 0.09 | 0.50 (0.05) | 1.00 |
| bowl | 0.00 (0.02) | 0.06 | 0.03 (0.05) | 0.32 | 0.00 (0.01) | 0.04 |
| rights | 0.00 (0.00) | 0.90 | 0.00 (0.00) | 1.00 | 0.00 (0.00) | 0.09 |

Note: Estimation of the equation 2 for the full, B2B and B2C samples. The probability of variable inclusion is given by PIP. Only PIP > 0.66, following the Schneider & Yaşar (2014), are employed in further regressions. Values in parentheses stand for standard errors.

Table 4. Linear dynamic panel model regression results

| brand | All | | B2B | | B2C | |
|----------------------|--------------------------|-----------------|--------------------------|-----------------|--------------------------|-----------------|
| | Coef. | p-value | Coef. | p-value | Coef. | p-value |
| brand _{t-1} | 0.867 (0.066) | 0.000*** | 0.561 (0.088) | 0.000*** | 0.875 (0.051) | 0.000*** |
| users | | | 0.049 (0.003) | 0.057* | | |
| gdp_pc | | | -0.364 (0.296) | 0.219 | | |
| mcap | -0.320 (0.142) | 0.024** | | | | |
| rev | 0.129 (0.193) | 0.505 | 0.012 (0.042) | 0.773 | 0.263 (0.201) | 0.191 |
| sell | | | 0.036 (0.022) | 0.104 | | |
| tan_asset | | | 0.008 (0.016) | 0.628 | 0.040 (0.109) | 0.717 |
| int_asset | 0.104 (0.087) | 0.235 | -0.053 (0.021) | 0.013** | 0.076 (0.068) | 0.262 |
| arec | 0.032 (0.086) | 0.705 | 0.022 (0.026) | 0.401 | | |
| apay | -0.005 (0.132) | 0.969 | -0.051 (0.019) | 0.006*** | -0.112 (0.175) | 0.523 |
| debt | -0.081 (0.068) | 0.235 | 0.010 (0.007) | 0.143 | | |
| tax | 0.176 (0.111) | 0.113 | | | | |
| c_news | 0.072 (0.043) | 0.092* | 0.010 (0.003) | 0.007*** | 0.023 (0.044) | 0.603 |
| soc_med | -0.070 (0.056) | 0.212 | | | -0.070 (0.035) | 0.044** |
| industry | 1.725 (0.934) | 0.065* | 0.574 (0.126) | 0.000*** | 1.292 (0.741) | 0.081* |
| i_news | -0.098 (0.132) | 0.458 | 0.098 (0.056) | 0.084* | | |
| ceo | 0.202 (0.097) | 0.039** | | | 0.185 (0.092) | 0.045** |
| rights | -0.002 (0.003) | 0.593 | -0.001 (0.000) | 0.071* | | |
| cons | 1.277 (1.053) | 0.225 | 3.726 (3.171) | 0.240 | -2.410 (1.253) | 0.054** |

Note: Equation 3 estimates of the full, B2B and B2C sample. Values in parentheses stand for standard errors. Set of explanatory variables varies across samples given the estimates in Table 3. Dynamic panel data estimation (one-step system GMM with robust standard errors). Instruments of lagged dependent variable capped to $t-4$ to limit the over-identification given too many moment conditions. AR(1), AR(2), Sargan and Hansen test provide for all samples reasonable values. Statistical significance given by ***/**/* stands for 1%, 5% and 10% respectively.

In the context of the information-rich economy and cognitive limits of economic agents, the results in Table 4 might imply interesting implications for the management of corporate reputation. In particular, across all samples, variables like *c_news*, *i_news* and especially *industry* are significant with considerably high coefficients. On the contrary, expected variables like selling and promotion (*sell*) expenses are not even part of the model according to BMA results for the full and B2C sample. Variable *sell* for B2B sample was significant according to BMA results but no longer in a dynamic panel environment. A similar effect occurs at the level of investment to tangible (*tan_asset*) or intangible (*itan_asset*) assets that are not significant with exception of B2B model for intangible assets. Therefore, one can argue that major part of corporate reputation is without the direct control of a company given by external factors like industry development and media activity. The rest of economic implications varies across the samples. For B2B companies, part of the variation in search volume is explained by the number of internet users. The interesting result is a negative coefficient of intangible assets. However, as B2B sample consists of large oil or construction companies, the negative perception in a society might be the result of their negative environment impacts. The negative sign related to accounts payable coefficient reflects that growing volumes of liabilities result in a negative perception. Regarding the work environment at B2B companies, negative sign of *rights* variables is not consistent because growing position of the particular company within the index should be related with a positive perception. Regarding the B2C companies, there is no statistically significant variable related to fundamentals. However, corporate perception is influenced by relatively less expensive factors (in monetary terms) like employment of social media or CEO. However, while CEO estimate has a considerably large positive impact the effect of social media is minor and negative.

Conclusions

This paper proposes the empirical set up to measure the concept of corporate reputation, define and evaluate its determinants. The paper proposes the volume of searches via Google as a tool that tracks the attention of society towards corporation and its quality. To identify the set of potential determinants that drives the attention of a society, the paper employs qualitative approaches CRQ™ and RepTrack® that provide the dimensions of corporate reputation. To further define the set of determinants, the paper employs BMA method. Set of variables estimated via BMA is further modeled in a linear dynamic panel environment that enables to handle for the lags of corporate reputation and the presence of endogeneity. The delivered results imply that current corporate reputation of well-known companies is the reflection of its historical trend. Further, a significant impact on corporate reputation is given by factors that are out of control of the particular company. Especially the perception of the industry strongly relates to the perception of the corporations. Regarding the B2B

companies, the impact of other variables is minor. An interesting result is given by negative relationship between investments in intangible assets and current corporate reputation that might reflect negative environment impact as the sample of B2B companies includes oil or construction corporations. Regarding the B2C companies, practical implication should be focused on public CEO activities that strongly drives the attention of a society.

References

- AAKER, D., 1991: *Managing Brand Equity: Capitalizing on the Value of a Brand Name*. New York: Free Press.
- AMBLER, T., 2003: *Marketing and the bottom line: the marketing metrics to pump up cash flow*. Ft Press, Prentice Hall.
- ARELLANO, M. and BOND, S., 1991: Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies* 58: 277-97.
- ARELLANO, M. and BOVER, O., 1995: Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics* 68: 29-51.
- BENITO, M. E., 2015: Model Averaging in Economics: An Overview. *Journal of Economic Surveys* 29(1): 46-75.
- BLUNDELL, R., and BOND, S., 1998: Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics* 87: 115-43.
- BUKOVINA, J., 2016: Social media big data and capital markets – An overview. *Journal of Behavioral and Experimental Finance*. 11(2016): 18-26.
- CHEN, H., MIRESTEAN, A. and TSANGARIDES, G. C., 2011: Limited Information Bayesian Model Averaging for Dynamic Panels with an Application to a Trade Gravity Model. *IMF Working Paper* 11/230.
- CHOI, H. and VARIAN, H., 2012: Predicting the present with Google Trends. *Economic Record*. 88(2012): 2-9.
- DA, Z., ENGELBERG, J. and GAO, P., 2011: In search of attention. *Journal of Finance*, 66(5): 1461–1499
- DE LUCA, G. and MAGNUS, R. J., 2011: Bayesian model averaging and weighted-average least squares: Equivariance, stability, and numerical issues. *Stata Journal* 11(4): 518-544.
- FALKINGER, J., 2008: Limited Attention as a Scarce Resource in Information-Rich Economies. *The Economic Journal*. 118(532): 1596-1620.
- FISKE, S. and TAYLOR, S., 1991: *Social cognition*. (2nd. ed.). McGraw-Hill, New York.
- FOMBRUN, J. C., GARDBERG, A. N. and SEVER, M. J., 2000: The Reputation QuotientSM: A multi-stakeholder measure of corporate reputation. *Journal of Brand Management* 7(4):241-255.
- HSU, J. F., WANG, Y. T. and CHEN, Y. M., 2013: The impact of Brand Value on Financial Performance. *Advances in Management & Applied Economics* 3(6): 129-141.
- HUANG, J., 2015: A Review of Brand Valuation Method. *Journal of service science and management*, 8(1): 71-76.
- JIA, Y. and ZHANG, W., 2013: Brand Equity Valuation: an Optimized Interbrand Model which is Based on the Consumer Perspective, *International Academic Workshop on Social Science*, Atlantis Press
- KAHNEMAN, D., 1973: *Attention and effort*. Prentice-Hall.
- KELLER L. K. and LEHMANN R. D., 2006: Brands and branding: Research findings and future priorities, *Marketing Science*, 25(6): 740-759.
- MOTAMENI, R. and SHAHROKHI, M., 1998: Brand equity valuation: a global perspective. *Journal of product & brand management*, 7(4): 275-290.
- REPUTATIONINSTITUTE, 2017: Stakeholder Measurement. <https://www.reputationinstitute.com/reputation-measurement-services/reprak-framework> (accessed, January 21, 2017).

- ROODMAN, D., 2009: How to Do xtabond2: An Introduction to "Difference" and "System" GMM in Stata. *Stata Journal* 9(1): 86-136.
- SAKAKI, M., OKAZAKI, M. and MATSUO, Y., 2010: Earthquake shakes twitter users: real-time event detection by social sensors. In: *International Conference on World Wide Web* (2010): 851-860.
- SAXA, B., 2014: Forecasting Mortgages: Internet search data as a proxy for mortgage credit demand. *CNB Working Paper Series* 14/2014.
- SCHNEIDER, A. P. M. and YAŞAR, Y., 2014: Revisiting Inequality as a Determinant of Mortality: A Bayesian Model Averaging Approach. Working Paper.
- SIGANOS, A., VAGENAS-NANOS, E. and VERWIJMEREN, P., 2014: Facebook's daily sentiment and international stock markets. *Journal of Economic Behavior and Organization*, 107(2014): 730-743
- SIMON, H. A., 1971: Designing organizations for an information-rich world, In. (M. Greenberg, ed.), *Computers, Communications, and the Public Interest*, 38-52, Baltimore: John Hopkins Press. (Cited after reprint in (H.A. Simon, 1982), *Models of Bounded Rationality*, 2. Behavioral Economics and Business Organization, Cambridge MA: MIT Press).
- SIMS, C. A., 2003: Implications of rational inattention. *Journal of Monetary Economics*. 50(2003): 665-690.
- SIMS, C.A., 2006: Rational Inattention: Beyond the Linear-Quadratic Case. *American Economic Review Papers and Proceedings* 96(2), 158-163.
- SPRENGER, O. T., TUMASJAN, A., SANDNER, G. P. and WELPE M. I., 2014a: Tweets and trades: the information content of stock microblogs. *European Financial Management*. 20(5): 926-957.
- SPRENGER, O. T., SANDNER, G. P., TUMASJAN, A. and WELPE M. I., 2014b: News or noise? Using Twitter to Identify and Understand Company-specific News Flow. *Journal of Business Finance and Accounting*, 41(7): 791-830.
- TEIXEIRA, S. T., 2014: The Rising Cost of Consumer Attention: Why You Should Care, and What You Can DO ABOUT IT. HARVARD BUSINESS SCHOOL WORKING PAPER 14-055.
- THALER, H. R., 2000: From Homo Economicus to Homo Sapiens. *Journal of Economic Perspectives*. 14(1): 133-141.
- TODD, M. P. and GIGERENZER, G., 2003: Bounding rationality to the world. *Journal of Economic Psychology*. 24(2003): 143-165.
- TUMASJAN, A., SPRENGER, T. O., SANDNER, P. G. and WELPE, M. I., 2010: What 140 characters reveal about political sentiment. In: *4th International AAAI Conference on Weblogs and Social Media*.
- YOO, B., DONTU, N. and LEE, S., 2000: An Examination of Selected Marketing Mix Elements and Brand Equity. *Journal of the Academy of Marketing Science* 28(2000): 195-211.