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The condition of economies. Do most valuable global brands matter?

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Keywords: *GDP; brand value; spatial regression; spatial cross-regressive model; spatial statistics; country of brand origin*

Abstract

Research background: Brands are considered to be the most valuable asset of a company. Some of them achieve spectacular global results. The significance of global brands is proved by the fact that their value is often greater than the sum of all company's net assets.

Purpose of the article: The aim of this article is to highlight that brand value does not only create company's value, but also leverages economies. The Authors claim that even though global brands are sold worldwide and are a part of "global factories", they strongly relate to the development of economies in the countries where these brands' headquarters are located.

Methods: Based on 500 Brandirectory, the Most Valuable Global Brands ranking powered by Brand Finance, an analysis of spatial autocorrelation of brand values, GDP per capita was performed and also the interdependency between them was illustrated with the use of the spatial cross-regressive model (SCM). The SCM approach allowed us to include spatial effects of brand values into the final form of the estimated equation. The empirical analysis was performed for 33 countries in 2014.

Findings & Value added: Findings confirm the hypothesis that there is a highly statistically significant relationship between brand value and GDP per capita and, what's more, it is observed that spatial dependencies matter for brand values. The evidence is based on the results of spatial cross-regressive model (SCM).

Introduction

Brands are considered to be the most valuable asset of a company (Kamakura & Russel, 1993, pp. 9–22; Barwise *et al*., 1990, pp. 43–59). Some of these brands achieve spectacular global results. Referring to the 500 Brandirectory 2016, the most Valuable Global Brands ranking powered by Brand Finance, ex. the value of No 1: Apple, is: $145,918 m. The significance of global brands is proved by the fact that their value is often greater than the sum of all the company's net assets (Barwise *et al*., 1989, pp. 34). The meaning of brands for businesses, companies, and corporations is evident (Zéghal & Maaloul, 2011, pp. 262–274; Belo *et al*., 2014, pp. 150–169).

The concept of brand equity was created in the late eighties of the previous century in the USA. The idea was motivated by the need to separate the short-term sales effects of marketing activities from the effects of giving a long-term competitive advantage, which in turn translated into profit (Kucharska, 2016, pp. 134–142). This concept has completely changed the role of brand managers, who became a financial value producers of intangible asset stored in human's minds. Brands are defined as general impressions, associations, opinions and values, in an ideological sense, related to a particular trademark (Aaker 1991; Keller 1993, pp. 1–22). Considering the specific nature of brand equity, it's a resource generated by a company, but accumulated and stored outside of it, and it's a result of intellectual capital related to the company and localized in the particular country of brand origin.

According to Kucharska (2016, pp. 134–142), the most popular methodologies of brand valuation base on three fundamental steps: STEP1— calculating accounting value (cash flow or revenue method of setting financial value multiplied by future revenue estimation index forecasted by respected institution such as Bloomberg or Thomson Reuters), STEP2 — calculating brand contribution index such as market share, price level, distribution level, convenience and brand strength influence someone's purchase decisions. The index is created, depending on an industry, based on historical data and market research. STEP3 — brand value is set up by multiplying financial and accounting value by brand contribution index. The result of this methodology allows to assess the final brand performance according to the particular period.

However, several antecedents can affect brand value, such as product quality (Dimitrova *et al*., 2017, pp. 377–402), brand awareness (Smaoui *et al.*, 2016, pp. 148–159) and marketing communication around the brand (Keller & Lehmann, 2006, pp. 740–759). In addition to the more explored

variables that influence brand value, a key influence is the country of origin (COO) — the country in which the brand owner's headquarters are located (Papadopoulos, 1993).

Therefore, the research question is: do global brands only create company's value, or do they also leverage countries' economies? Namely, is there a relation between the particular global brand value (global position) and the condition of the economy of the country of brand origin?

The knowledge-based 'network economy' has contributed greatly to economic growth in recent years (Malik *et al.*, 2014, pp. 32–48). According to Nakamura (2010, pp. 135–155), intangible investment expenditures have risen from roughly 4% of U.S. GDP in 1977 to 9–10% in 2006. Referring to World Bank estimates (Hamilton *et al*., 2005, pp. 61–70), approximately 78% of the world's wealth is attributed to intangible capital. In developing nations, intangible capital accounts for 59% of the wealth, while in OECD countries this share is approximately 80%. Intangible capital is an important argument of a nation's wealth. The 'new economy' is underpinned by intangible capital (De, 2014, pp. 25–42) such as brands. Brand builders are the new primary producers in our so-called knowledge economy' (Bisett, 2000, p. 196). Thus, we have decided to examine how global brands performance relates to the performance of countries where these brands' headquarters are located. The Authors start with the current literature review looking for the research gap identification.

Literature review

Only a few scientific articles correspond with our research question. Perhaps the reason is that the answer requires multidisciplinary research at the intersection of Management, Marketing, Economics and Statistics. Referring to Pike (2009, pp. 190–213; 2013, pp. 317–339), the conclusion about brands and branding geographies is that they have the potential to stimulate a novel approach to addressing spatial questions at the intersections of economic, social, cultural, political and ecological geographies. Particularly, referring to Pike (2015, pp. 40–53), one of the most important approaches of branding geographies is spatial circuits of brand value and meaning and uneven development. Referring to this field, one of the most interesting papers was written by Ferilli *et al.* (2016, pp. 62–75), who examined the correlation between the Top 100 Most Valuable Global Brands positioning and positioning of the corresponding countries in terms of quality perceptions. Their findings suggest that although the correlation between positioning of a country and positioning of corporate brands exists, it strongly de-

pends on particular categories and economy sectors which present different levels of representativeness of the country's most typical attributes. These findings supported the study by Pappu *et al.* (2006, pp. 696–717), which examined the relationships between the country of origin and multidimensional consumer-based brand equity. Their findings confirmed that the image of the country of origin (COO) affects the equity of a brand but significantly varies by product category. They further established that respondents are more loyal towards a brand made in a country with strong associations with the particular product category. Although the presented results display a strong connection between the most valuable brands and their countries of origin, there is no evidence supporting the existence of a connection between brand value and a particular country's economic condition. Thus, the Authors have decided to examine how global brands relate to the level of economies development.

Referring to Wang *et al.* (2015, pp. 93–102), Gross Domestic Product (GDP) is widely accepted among several social-economic indicators as the most efficient indicator of economic condition. This is why it has been decided to choose the GDP as an indicator of the economy's performance. To authors knowledge, this study is the first that examines the potential interdependency between brand values and GDP of the countries where these brands' headquarters are located.

Summarizing, the Authors have identified the research gap: the lack of the evidence supporting the existence of a connection between brand value and a particular country's economic condition. Thus, the next section describes the method of the research employed to achieve the aim of this study to fulfill the gap and to verify the hypothesis that the most valuable global brands and conditions of economies of their country of origin are spatially correlated.

Research methodology

The empirical analysis was performed in a few stages. In the first of them we made a preliminary assessment of statistical significance of the relationship and spatial autocorrelation for brand values and GDP per capita, which constituted the basis for selecting the final form of regression model. Next, coefficients of the linear and cross-regressive forms of spatial regression model was estimated for GDP per capita (its natural logarithm). The brand value data was selected on the basis of the yearly published ranking of brand value Brandirectory 500 top global brands 2014 ranking powered by Brand Finance (Brandirectory, 2014). The analyses were performed for 33

selected countries, which are not in every case reciprocal neighbors. Thus, the spatial weights matrix based on inversed distances (Anselin, 2002, pp. 247–267) was constructed.

In ordinary least squares (OLS) regression it is assumed that the modeled phenomena or processes are independent of their location, so there is no interaction between the two objects. This assumption is not always suited to the analysis of socio-economic phenomena in spatial terms. According to the so-called "first law of geography" formulated by Tobler (1970, pp. 234–240) all objects in space (observation units) interact, and spatial interactions are the greater, the smaller the distance between objects. Thus, in the analysis and modeling of data located, we must take into account the spatial interactions, which may relate to both the dependent variable and the random component. In a situation where the value of the dependent variable in a given location affect the value of this variable from other locations, there is the so-called spatial autoregression. On the other hand, a case where certain spatially autocorrelated variables are omitted or cannot be taken into account relates to spatial autocorrelation of the random component (Rogerson, 2001, pp. 215–227). Interdependence of spatial data makes the assessment of the coefficients of regression function estimated with OLS inaccurate (Longley *et al*., 2005, pp. 86–107). This means that the t-Student statistics obtained when testing the statistical significance of the independent variables of the OLS model may be only seemingly important. Consequently, there is a risk that the results of statistical inference will be wrong. The use of spatial regression modeling enables the elimination of the negative impact of spatial effects. In case of spatial relationships, more appropriate is the use of autoregression models and spatial autocorrelation (Rogerson, 2001, pp. 215–227).

The basis for the selection of the most accurate form of the regression model is the analysis of spatial autocorrelation. It is defined as the degree of correlation of observed values of the variable at its different locations. This means that the value of the modeled variable is related to values of the same variable in other locations, and the degree of relationship in accordance with Tobler's rule (closer objects are more relevant than distant) affect the relative position of objects and their geographical (or economic) distance. We can take into account the specific relationship between the observation units (resulting from their location) thanks to the design of spatial weights matrix (Anselin, 2010, pp. 1–17). It is a square matrix with n×n dimensions, which elements reflect the existing spatial structure. Specification of that matrix belongs to arbitrary decisions taken by a researcher and a choice of the alternative method of weighing is often due to the knowledge of the spatial structure of the phenomenon and links between

units. It is assumed that links of spatial entities are positively affected by mutual proximity and negatively by shared distance. Spatial weights matrix is a structure whose elements obtain value equal to 0 when two objects *i* and *j* are not neighbors, and 1 otherwise. In order to construct a matrix of spatial weights based on inversed distances, the Euclidean distance between those objects is computed and then truncated to the binary value.

Specification of spatial weight matrices is a prerequisite and the first step in the analysis of spatial autocorrelation. Among many measures used for spatial relationships testing the most commonly used is Moran's I statistic (Longley *et al*., 2005, pp. 86–107). This statistic is calculated based on the formula:

$$I = \frac{n\sum_{i=1}^{n}\sum_{j=1}^{n}(z_i-\bar{z})(z_j-\bar{z})}{\sum_{i=1}^{n}\sum_{j=1}^{n}w_{ij}\sum_{i=1}^{n}(z_i-\bar{z})^2}, \quad (1)$$

where:
n – number of observations (locations),
z_i – the observed value of the z variable for all n observations (locations),
w_{ij} – weight of spatial interactions (connections) between observations (locations) i and j.

The statistical significance of spatial autocorrelation measured by Moran's I statistic assuming null hypothesis of a random distribution of z-values (lack of spatial autocorrelation) is verified with the standardized Z_I statistic:

$$Z_I = \frac{I-E(I)}{\sqrt{Var(I)}}, \quad (2)$$

where $E(I) = -\frac{1}{n-1}$ stands for the mean and Var(I) for the variance of its distribution. Evaluation of the degree of spatial autocorrelation is made on the basis of Moran's I value and Z_I test of significance. The spatial autocorrelation is positive when revealed similarity in terms of the analyzed variable between adjacent objects produces value $I > -\frac{1}{n-1}$ and $Z_I > 0$. Otherwise, ($I < -\frac{1}{n-1}$) I statistic indicates a negative autocorrelation (high values are adjacent with low). On the other hand, $I = -\frac{1}{n-1}$ (close to zero) and $Z_I \approx 0$ mean that the values of the considered variable are randomly distributed in space.

Due to the fact that in the considered research sample spatial interactions (defined by the spatial weights matrix) were detected only for the explanatory variable — brand value (see Table 1.), the Authors were forced to assess the SCM (Spatial Cross-regressive Model). In SCM models, similarly to the models with distributed lags in the analysis of time series, it can be assumed that there is an influence of both non-lagged and also spatially lagged variables. Thus, in the last stage of the empirical analysis spatial cross-regressive model for GDP per capita with explanatory variables: brand value and its first order of spatially lagged values was estimated. The SCM model is formulated in the following equation:

$$y = X\beta + WX\gamma + \varepsilon \tag{3}$$

Therefore, it was assumed that the values of the explained variable y_r depend on the value of the selected variable x_{ir} (i=1, 2, …, k) the given spatial object (e.g. country) and the weighted values of the same variable from neighboring countries: $w_{rs}x_{is}$ $(s \neq r)$ according to the construction matrix of spatial weights (W). Assuming the classical assumptions of stochastic structure $\varepsilon \sim N(0, \sigma^2 I)$, structural parameters of SCM can be estimated with the classic least squares method (Suchecki, 2010, p. 251).

Results

In the first stage of the analysis, the calculations of spatial autocorrelation Moran's measure for brand value and GDP per capita (its natural logarithms) were performed. When spatial autocorrelation statistics are computed for variables, such as GDP per capita or brand value, they are based on the assumption of constant variance. This is usually violated when the variables are for areas with greatly different populations. That is why the Authors implemented here the Assuncao-Reis empirical Bayes standardization to correct it (Assunção & Reis, 1999, pp. 2147–2162). As it was previously mentioned and is shown in Table 1., the highly statistically significant ($p<0.05$) spatial autocorrelation Moran's I coefficient was obtained only for brand values. That is why it is the basis to make the estimation of the structural parameters of SCM model in the next step of the presented analysis (Rogerson, 2001, pp. 215–227). In Table 2, the results of the estimation of linear regression model LM and regression model with spatial effects of explanatory variable — brand value (SCM) are presented. The simple linear model (LM) showed no statistical significance of structural parameters and low goodness of fit (R-squared coefficient). The spatial cross-

regressive model (SCM) however, proved us higher (39.4%) determination coefficient and high statistical significance ($p<0.001$) of coefficients together with lower AIC (Akaike information criterion). The presented fit to the empirical data was achieved mainly due to more complete description of the spatial autocorrelation of brand value. The choice of the final form of the regression model (SCM) caused a further significant improvement of explanatory abilities of the analysis.

Summarising, the presented results support the hypothesis about the existence of a spatial correlation between the brand value and the level of development economies of the countries where these brands' headquarters are located. According to the fact that autocorrelation analysis was performed with EB standardization, the presented results are not biased by population differences resulting in differing domestic market size, which allows inferences to be made about "brand" and its influence on the economy.

Discussion

The results presented above corroborate the assumption made in the introduction regarding the relationship between best global brands and the condition of economies where brand owners are located. It may seem disputable however to what extent it is justifiable to analyze the influence of global brands on economies of countries where these brand owners' headquarters are located if we take into account their global reach. Thus, bearing in mind the fact that global brands are one of the most valuable assets of "global factories" and when global companies invest in brands (Buckeley, 2009, p. 6) they perform constant spatial reorganization, internationalization and integration of all processes connected with brand value creation which make it difficult to assign them to the one separate country. There is no question about the global character of these processes. The question can be asked about the reasons for the decision to examine the problem of spatial dependencies for the investigated relationship between brand value and GDP of the country where the brand owner's headquarters is located. Referring to Buckeley (2009, pp. 131–143), we claim that although "global factories" put a radical shift into generally all economies of all the locations of all their activities, the control or orchestration of these operations remains very firmly within the advanced countries (Buckley & Strange, 2015, pp. 237–249), where the headquarters of the owners of "global factories" are located. Moreover, referring to Kamakura and Russel (1993, pp. 9–22) and Barwise *et al*. (1990, pp. 43–59) we conclude that a brand, being the

key intangible asset of the company, is analogously the key intangible asset of the "global factory". Thus, the assignment of global brands to the "countries of origin" is substantiated.

Moreover, bearing in mind the presented results of our research, it is worth highlighting that the whole set of 500 cases of global brands' value data has been assigned to only 33 countries, 38% of which from the US and 33% to Europe. None of the European brands was assigned to the old ex Eastern Bloc (details included in Table 3.). This situation pictures that regional integration and governance strongly influence, either in a positive or a negative way, both: brands and economies. Taking into consideration all the above, let us summarize: global brands and economies are strongly related, and they constitute an interesting area for research which should be continued. The interesting question for the further research is: how does this relation change in time? Does it become each year stronger or rather opposite? The estimation of panel data regression model would establish the full picture of this relation meaning for economies.

The main limitation of the presented survey is that, because of data accessibility, only 33 countries have been examined, and only one indicator of a particular economy's condition was used. It is very likely that a deeper examination will provide us with more complex conclusions.

Conclusions

The spatial autocorrelation analysis of this paper confirms a positive association between the GDP of the country where the brand owner's headquarters is located and the brand value, as was emphasized in the introduction. The presented results lead to the conclusion that global brands can strongly leverage economies. However, in our study we did not compare global brands' influence on other drivers of countries' economies. It would be interesting to examine and compare results of the relationship of brand value with other economic indicators referring to the condition of economies. Correlation analysis of the dynamics in time of this relationship could also result in reaching a thought-provoking conclusion. The presented findings prove that having strong global brands is positive for economies, hence governments should create favorable conditions for the development of global brands. It not only leverages economies but, referring to Ferilli *et al*. (2016, pp. 62–75), builds a positive image of the country where the brand originates. However, global brands these days are often subject to international transactions. For example, only recently China came to appreciate the significance of global brands. In October 2014 the Chinese global

concern Lenovo bought Motorola from Google. The total purchase price at close was approximately US$ 2.91 billion.

This is why the condition of global brands and economies constitutes such an interesting research area, especially if we take into account social pro- and anti-globalization trends as well as historical and cultural background. This work draws attention to a strong correlation, supported with empirical studies, between brand value and a country's economic condition, and encourages research in this area.

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Annex

Table 1. Spatial autocorrelation statistic for brand value and logarithms of GDP per capita

Variable / Statistic	Moran's I	E(I)	$\sqrt{Var(I)}$	Z_I	p-value
Brand value	0.175	0.032	0.079	1.875	0.042
Log GDP per capita	-0.032	-0.030	0.018	-0.105	0.491

Table 2. Estimation of LM and SCM models for logarithms of GDP per capita (standard errors in brackets)

Model	LM	SCM
Constant	10.094 *** (0.181)	9.438 *** (0.253)
Brand value	1.987 * (0.827)	3.244 *** (0.770)
Spatially lagged brand value		36.759 *** (7.806)
Adjusted R^2	0.026	0.394
df	31	30
AIC	95.2	83.1

Note: * p<0.05, ** p<0.01, *** p<0.001

Table 3. The most valuable global brands (2014)

Country	item	%
USA	190	38.3
Japan	40	8.1
France	38	7.7
UK	38	7.7
China	33	6.7
Germany	32	6.5
Switzerland	16	3,2
Korea	12	2.4
Canada	10	2.0
Italy	9	1.8
Netherlands	9	1.8

Table 3. Continued

Country	item	%
Russian Federation	9	1.8
Spain	9	1.8
Australia	8	1.6
Sweden	7	1.4
Brazil	5	1.0
India	5	1.0
Denmark	3	0.6
Norway	3	0.6
Austria	2	0.4
Belgium	2	0.4
Chile	2	0.4
Saudi Arabia	2	0.4
Singapore	2	0.4
United Arab Emirates	2	0.4
Colombia	1	0.2
Luxemburg	1	0.2
Malaysia	1	0.2
Mexico	1	0.2
Portugal	1	0.2
South Africa	1	0.2
Taiwan	1	0.2
Thailand	1	0.2

Source: authors' own calculation based on 500 Brandirectory (ranking powered by Brand Finance http://brandirectory.com/).