"The use of the "Rational" system of global marketing communications in management of international enterprises"

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BUSINESS PERSPECTIVES

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THE USE OF THE "RATIONAL" SYSTEM OF GLOBAL MARKETING COMMUNICATIONS IN MANAGEMENT OF INTERNATIONAL ENTERPRISES

Abstract

The modern system of global marketing communications is not ideal, that is why management of international enterprises needs to use creativity in their attempts to predict the results of the marketing activities. They often fail in forecasting, because specialists do not have necessary practical models and data.

The article deals with the questions of developing a model of the "rational" system of global marketing communications, which will be ready for the implementation into managerial processes of the Ukrainian firms. The model in the research is based on one-factor and multi-factor equations with calculations on the example of the well-known American company Nike, which works in the segment of apparel and footwear industry and can be a bright example of building a strong marketing communication strategy. Methods of linear and polynomial trends, smoothing average and exponential smoothing were used for the development of the proposed model.

The examination of the correlation between global income, costs on marketing communication activities of the international company and index of satisfaction by this enterprise on the market in the frames of the econometric model's work showed the dependency, which can become a basis for future analysis. The invented model of the "rational" system of global marketing communications shows how managers can calculate the resultativity of specific marketing instruments, which they plan to accept as appropriate. Different indicators can be used in forecasting the effects of global marketing communications on the performance of international enterprises. The article shows that the more indicators are used in the model, the more accurate is the result.

Keywords	global marketing communications, management, rationalism, communicational strategy, business, econometric model, marketing, global income
JEL Classification	G32, D81, M31

INTRODUCTION

Every international company makes a lot of efforts for regulating and combining all the mechanisms, which are necessary for effective business performing. Management responsibility includes control of many spheres of activity, including marketing. Especially it is so for making decisions during communicational and marketing management in the economic environment of the 21st century. In modern society, creating an "ideal" system of global marketing communications, which can suit all the effectiveness requirements and at the same time minimize the marketing risks, is an important element of the work of specialists, because it has never been achieved yet. The search of the individual approach to the target audience, which can satisfy their needs, belongs to the strategic aims of companies. Communication with clients should be conducted on the level, which will provide all the information about the product to them.

However, due to a number of consequences building an "ideal" system of communications is a difficult and a practically impossible task, that is why it becomes advantageous to get deeper into the topic of creating a "rational" system of global marketing communications, which is close to the "ideal" one, but at the same time has an observational error, which allows avoiding the only theoretically possible results.

For managers of large companies, the development of such a model can enrich the business control principles and consequently minimize the risks during the tentative calculation of the results from specific marketing actions. The research is relevant, because the problem of riskiness and uncertainty remains unsolved on the level of international trade and economic relations.

1. THEORETICAL BASIS

The issues of global marketing communications and the creation of the "ideal" system of communications based on them have been previously researched by scientists in the number of academic studies. The "ideal" system of internet marketing was examined by the marketer Spencer Powell in his publications (2015), also similar researches were conducted previously by professional marketers Fill and Jamieson (2006), Markillie (2004) and a technical director of the marketing agency nine 10 Incorporated Podsada (2014). In Ukraine, the research of the theme of global marketing communications was taken by such Ukrainian scientists as Barybina (2015), Skrynkovsky, Bochko, and Haruk (2016), Prymak (2011) and others. However, in Ukraine scientific publications touched the research of creating exactly "ideal" systems of global marketing communications only partly. Moreover, the "rational" system of global marketing communications has not been researched at all.

Speaking about the researches of the communicational management questions made by European and American scientists, this was experienced by Raupp and Hoffjann (2012), Lesko and Hollingsworth (2011), Göransson and Fagerholm (2018), Newman (2016), Shonubi and Akintaro (2016) and others. They examined the problems, in which way is better to organize communicational processes in international companies and organizations and outside of their boundaries. But they didn't touch in their works the process of creating "ideal" or "rational" systems in marketing communications of the local or global size. Most of them at all in their scientific works uncovered the theme of exactly the management of internal communications in enterprises and the external part remained undisclosed. In this case, for exam-

ple, Newman (2016) defined in his article how to plan the communication in such a way that that it would lead the company to significant organizational changes for the better.

According to Shonubi and Akintaro (2016), communication is usually very focused on all the human activities in the frames of the companies. They distinguish among the others David Berlo's Model of Communication (the one where communication goes in the direction from the sender or the source), Harold Lasswell's Communication model (who, about what, by which channel of information, to whom and with what aim performs the communicational process) and the S.M.R.E. Model of Communication. The problem is that all these models of communication are not being analyzed from the point of their possibilities of theoretical approximation to the "ideal".

One of the themes, which is the basis for the creation of the "rational" system of global marketing communications, is a topic of risks minimization in the marketing activity of enterprises. That's why it is logical to research the literature about risk management. The topic is widely highlighted in world scientific journals. It was analyzed by such American, European and Asian scientists as Aven (2015), Iacob (2014), Junior and Carvalho (2013), Bromiley, McShane, Nair, and Rustambekov (2015), Bromiley et al. (2015), Mohammed and Knapkova (2016), Ridha and Alnaji (2015), Gorzen-Mitka (2017), Braumann (2018) and others.

Most of the previous researchers tried to demonstrate, in which way does the influence of risk management on the business productivity take place. They directed their scientific views on risk assessment and risk management studies, which learns the theories of risk appearance and their

elimination in entrepreneurship. On the basis of their work, further scientific generalization can be made, which will lead to obtaining new data about marketing risks of companies. Thus, the preliminary researches of the European and American scholars form the background for constructing actual inferences that are useful for developing a "rational" system of global marketing communications and its use for the effective management of international enterprises.

The aim of the recent research lies in the development of the econometric model of the "rational" system of global marketing communications, which is close to the "ideal".

The main aim is to devise an innovative econometric model for making possible to increase the effectivity of making managerial decisions during global marketing communication in international enterprises.

The scientific methods, which were used for conducting the research, are quantitative, because statistics for creating a "rational" system of global marketing communications is formed from numbers. Quantitative data are more often used for management researches than qualitative, because it has accurate measurement and is better for mathematic analysis, which is required in the process of developing an econometric model. The advantage of quantitative research methods over qualitative in management lies in the field of the wider range of visibility that they bring to the study.

Research strategy in the article includes examining formal theory literature, gathering statistics data, and building an econometric model. This plan builds a clear way for the next gradual development of theoretical and practical approaches to the theme.

Data collection methods for the research included the search of statistics indicators for an American company Nike, which works in the field of the apparel and footwear industries. The list of indicators for Nike used in the research consisted of global income of Nike systematized by years, costs on marketing communication activities named costs on creating demand and index of satisfac-

tion by Nike products on the American market. On the basis of Nike's experience, smaller companies from Ukraine and other countries can transform their communicational strategies in order to improve their business.

The basics of econometric methods included statistics processing and an econometric method of regression analysis. Single-factor and multi-factor models were built with the help of linear and polynomial trends, methods of smoothing average and exponential smoothing, which are indispensable for econometric calculations and evaluation of the received aftereffects.

2. RESULTS

2.1. Management view on the modern system of global marketing communications

Global marketing communications have strongly fixed up in the technology of building an accessible interconnection between international brands and their customers. Management of marketing communications is the main activity that is responsible for creating a strong international brand.

By the definition of Prostova (2012), marketing communications are informational ties of the enterprise with their own surroundings, which should ensure successful solutions to the tasks in the field of marketing. On the other hand, Hmarska (2011) identifies marketing communications as a certainly two-way process: from the one side, the influence on target audience is foreseen, from the other side, obtaining counterinformation about reactions of these audiences on the influence made by the firm.

In the 21st century, there exists a habitual structure of performing global marketing communications, which is usually used by brands in different countries of the world. Marketing strategies differ from each other, but general principles of creativity, truthfulness and completeness of information during the organization of the marketing relations still stay the same. Owing to globalization processes in economy, systems of performing marketing communications in USA, Europe or Australia are

similar to each other. According to the data from the statistic resource Statista (2017), 70% of influential marketing communication occurs in digital kind (this doesn't concern brands, which offer for trade luxury goods, for example, cars). Herewith, an American resource Adweek points out that in the USA after the demonstrations on the screens in cinemas of the film "Three billboards outside Ebbing, Missouri" at the beginning of the year 2018, the whole attention of customers was attracted to billboards as a source of marketing (Monllos, 2018). It influenced the growth of the quantity of outer advertising in the part of distribution channels of marketing communications by international companies.

The questions of the possibility to create an "ideal" system of global marketing communications, how it is better to do and how to rule it in the frames of management of the international company still stay in the field of controversial topics among scientists. Markillie (2004) studied this theme in 2004 in his analytical work for "The Economist". And in the year 2015, the researches were still continued by Powell (2015) who was trying to separate the constituents for receiving the perfect system of internet marketing (Powell, 2015). Markillie (2004) averred in his article "About the ideal market" that the market since the year 2000 (and it was 18 years ago) has fully moved to the internet. By his distribution criterion, people have formed two groups: "those who firstly searched and explored the necessary product in the internet and then bought it in the real shop" and "those who explored and then bought a necessary product in the online-mode". Even in that time it started to arouse the reaction from the side of brands as changes in the marketing strategy of the company. In the year 2015, Powell (2015) has already been mentioning that for creating an "ideal" system of global marketing communications, in his opinion, a company had to use next instruments together: a system of content management, blogger platform for sharing information, mechanisms for search optimization, instruments for monitoring social media and making publications, instruments for email marketing, their own web-site, analytical instruments in the look of special programs and a system of controlling the connection with clients for the automatization of communicational

processes (Powell, 2015). This is actual and now, but still doesn't give the ability to create a fully "ideal" system of global marketing communications, because here the risks, which take place during marketing activity and marketing activity of global size, are not calculated.

But today the usage of previous researches experience made by different scientists and marketers-practitioners to prove the possibility to create an "ideal" global marketing communications system seems to be a more likely task.

In order to consider the system of global marketing communications to be ideal, it is necessary for it to provide maximum rates of performance and effectiveness of marketing communications for further management and delegation of powers. By using the method of induction and by combining the above facts with each other, we get the next definition of the term an "ideal" system of global marketing communications: an "ideal" system of global marketing communications is a complex of communicational processes combined with each other, which were brought to the maximum level of effectiveness of the marketing contact of companies with clients by a natural or non-natural way and at the same time take into account the minimization of possible risks, forecasting the methods to avoid them".

Marketing activity is aimed at determination, analysis and taking into consideration the factors, which influence the processes of manufacturing products and their promotion on the market. In the process of making a decision concerning the choice of the strategy and tactics of development, planning production and sales activities, financial activities there are no reasons to affirm that all the necessary information was analyzed and all the factors were taken into account, which have an influence on the progress of the conjuncture of specific commodity markets. Realization of marketing activities is done in the market environment, the condition of which is continuously changing under the influence of many multidirectional factors, which usually depend not only on the actions of one concrete enterprise. Due to this situation, important marketing decisions are made on the basis of incomplete, inaccurate and contradictory information, in other words, in the conditions

of uncertainty and the risks, which it creates. It is clear that for the rational activity of the subject of decision-making, it is important to avoid the possible unsuccessful management results in perspective.

Here comes a problem of carrying out a detailed qualitative and quantitative risk analysis with further actions regarding its management. The fact that quantitative grade rating is a peculiar "vector", which components reflect its various facets and are formed depending on the aims of the research, available information, attitude of the subject of risk to uncertainty and conflicts, should necessarily be taken into consideration. It requires approach to the justification of rational marketing decision from the position of multicellularity and risk taking.

Modern system of global marketing communications can't be named ideal. It has a number of disadvantages, which are shown in Table 1. It is need-

ed to give a description of every element from this table according to the classification of marketing risks for ostending their significance for the influence on making the "not ideal" system of communications different from the "ideal".

A systemic approach to the solution of marketing issues, which exist today (mentioned in Table 1) has the biggest value for creating an up-to-date system of communications. One solved problem without solving another or several others will not allow achieving the aim of "ideality" in the system of global marketing communications. According to the opinion of Beakbane (2003), for the forthcoming to the "ideal" system of global marketing communications, executives and marketers of the brand need to have a clear vision of how the communicational content on the world level will look like. Without it, it is impossible to deliver your vision to the foreign consumer and to model the necessary reaction from him.

Table 1. Disadvantages and risks of the "unideal" system of global marketing communications from the management point of view

No.	Characteristics of the "unideal" system	Characteristics of disadvantages and risks
	Disadvantages	
I	1. Non-integration of used communication sources	Digital and analogue sources of communication must be necessarily coordinated with each other. If this harmonization is missing, then people who get information from the internet and, for example, from billboards will have dissonance in perception of data. This will minimize effectiveness of marketing activities
	2. Lack of connection between marketing strategies of different products in one company	This disadvantage is the continuation of the previous one. It means that not all global enterprises count the common conception of marketing communication. That's why appear such cases when during the creation of the communication strategy for some products in the frames of one company specialists don't take into consideration marketing strategies of other products
	3. Low quality of the marketing content and its visual non-aesthetics	Only people who can aesthetically broadcast information and create highly artistic media works should be responsible for filling official web-resources with content. Bad-quality visuals can spoil the image of the company
	4. Discrepancy in marketing demand and marketing proposition	It is a situation when proposition and style of the information presentation don't suit good the target audience of the brand. In this case, the dissonance of the product-datum perception by potential clients and their expectations from the product happens. Of course, it negatively influences on the sales volume
	Risks	
II	1. The risk of inadequate estimation of market capacity	The risk of the wrong estimation of market capacity means that too large or too small amounts of the goods can be produced for the market, for avoiding it the evaluation of the market capacity precisely is important
	2. The competitive risk	The risk of inaccurate, incomplete or untrustworthy analysis of the market and activities of competitors in the same segment of the market
	3. The risk of non-acceptance of products by consumers	The risk, which includes errors in the analysis and foreseeing the future reactions of the consumers on the goods produced by the firm
	4. The risk of making incorrect marketing decisions	People who work in the department of marketing communications, even professional specialists, can make mistakes – risk of the human factor
	5. The risk coincided with changes of the market situation in the terms between its analysis and making marketing decisions based on this analysis	The risk, which describes the always-changing economic environment of the market. The changes can come in very small amounts of time, even in the terms between the moments of making the analysis of the market and making marketing decisions a little bit later

It is logical to distinguish the concept of the "real" system and "ideal" system of global marketing communications in the modern competitive environment. "Ideal" systems in practice are an infrequent phenomenon. Such simulated systems usually have a mainly analytical value for the development of science, not influencing the market position and practical realization. The example of it can be found in the analysis of the economic term "perfect competition", which exists only in economic theoretical materials.

It is possible to prove the probability of creating an "ideal" system of global marketing communications using three rules:

• relative features determine "ideality" of the communicational system;

• there exists a list of recommendations using which in this or that amount it is possible to achieve the real creation of the "ideal" system of global marketing communications. Among them exploitation of integrated marketing communications, formation of collaborations with famous artists and ambassadorship, taking into consideration linguistic colloquialism, creativity of advertising ideas;

• an ideal complex of marketing communications can be checked by effectiveness, which it brings in comparison with other brands and other settlement periods of the company, regardless of financial investments into it.

In the realities of the 21st century, the "ideal" system of global marketing communications is still not implemented in practice. But during its further study it is possible to move to it very closely, what is an urgent aim of communicating with local and foreign clients by global brands. An "ideal" system now has a theoretical significance and is depicted as a perfect variant of the real situation, which should be gained for the achievement of the highest level of productivity.

2.2. "Rational" system of global marketing communications

For the impact exploration of the "ideal" system of global marketing communications on practice,

it is real to build a model of the "rational" system of global marketing communications, the one, which will be as close as possible to the "ideal" example. It can be done with the help of the creation of several regression single-factor models and one multi-factor model. Forecasted numbers of the explanatory variables in models should be done by smoothing methods. The more deficiencies can be foreseen, and the lower marketing risks are, the closer to the ideal becomes the "rational" system of global marketing communications.

So, it can be said that a "rational" system of global marketing communications is an as close as possible to the "ideal" set of global marketing communications, in which the marketing risks are minimized, all the possible disadvantages that can affect the productivity of the marketing campaigns are taken into the account and the counter-measures are developed for the cases when the risky events still occur during the implementation of the global marketing strategy of the firm. At the same time, it is not one hundred percent ideal, but tries to get to this mark very closely. The rational system has not been precisely researched before and this topic can become a scientific discovery for companies, which try to build their brands in the global society nowadays.

The apparel and footwear industries are influenced by the use of marketing communications in modern society, because people choose what to wear according to the brand popularity as one of the indicators. Nike, Adidas and Puma companies are the representatives of businesses which work in this field, so they can be used as an example of successful implementation of the effective communicational policies.

At the same time, Nike, Adidas and Puma with their long-term experience can work as a behavioral pattern, which can be adopted by Ukrainian companies and also companies from other countries, which are on the way of their development. The first reason of it is the possibility to use the already existing techniques, which help in building a powerful system of global marketing communications in the company without inventing them personally. Secondly, the use of Nike, Adidas and Puma is supported with the accessibility of the data needed for
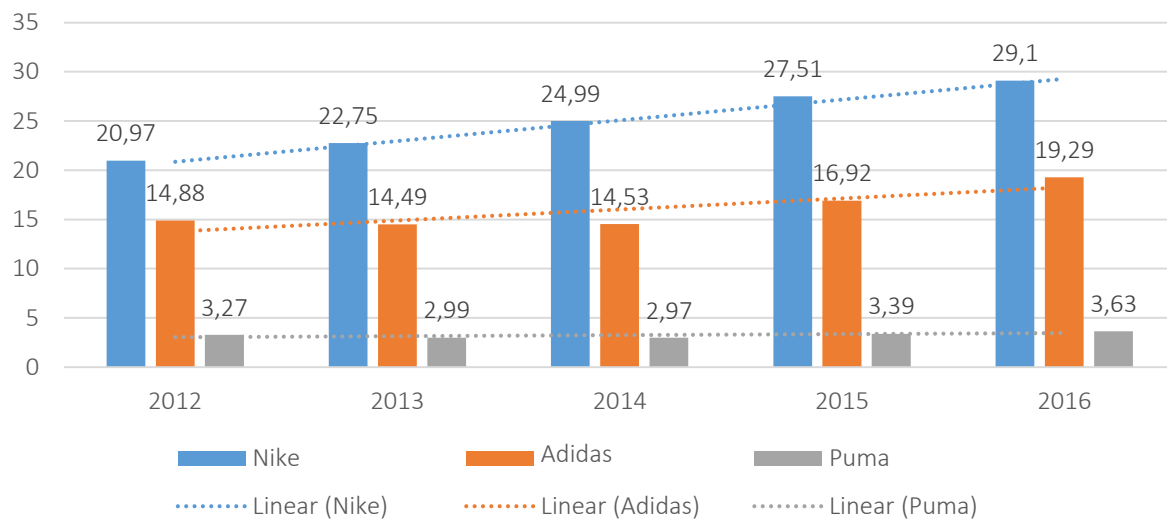
Figure 1. Global incomes of Nike, Adidas and Puma, 2011–2016, in billions of euros

the research. And thirdly, the traditional view on marketing communications which is mixed with fresh ideas in the communicational policies of these companies gives an area for further development of contemporary approaches to the researched question.

Statistic data from the Figures 1, 2, 3 show the real indication of the actual performance for companies Nike, Adidas and Puma. Let's build the single-factor and multi-factor econometric models — for doing this, we use the index satisfaction of American consumers with sports footwear companies, the size of the company's expenses for the creation of demand (in billion dollars) and the income of companies (in billion euros). It is log-

ical to prove the dependence of the index of satisfaction of American consumers from the costs of these enterprises on creating demand and from their income.

2015 is the last year in the statistics, on which the information from the web-resource Infogram ends. According to official financial reports of the company Nike, which are shown publicly every year, in 2016 the costs on creating demand were 3,3 billion dollars (Investors, 2016). Compared to the previous year, it meant the growth for 2%. It reflected the investments into direct marketing (DTC marketing), organization of events and sports marketing, which were compensated by partly lower costs on advertising.

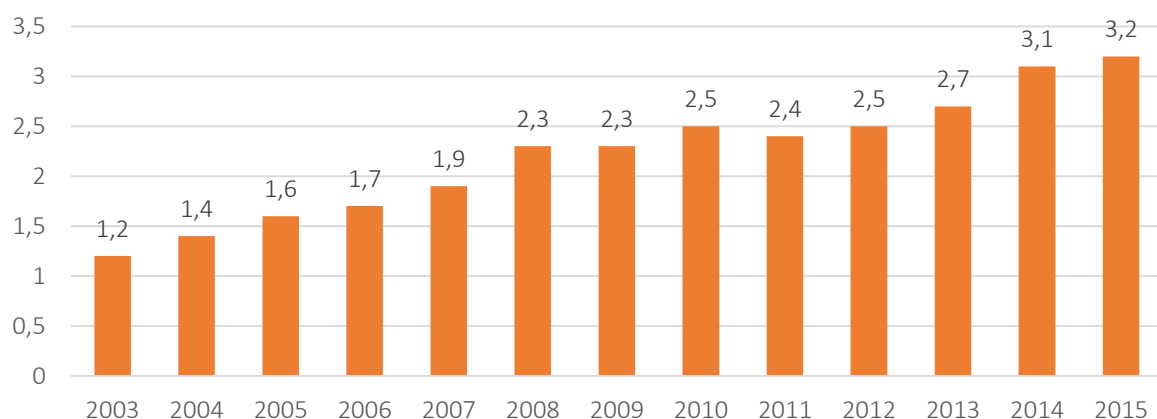**Figure 2.** Costs of the company Nike on creating demand, 2003–2015, in billions of dollars
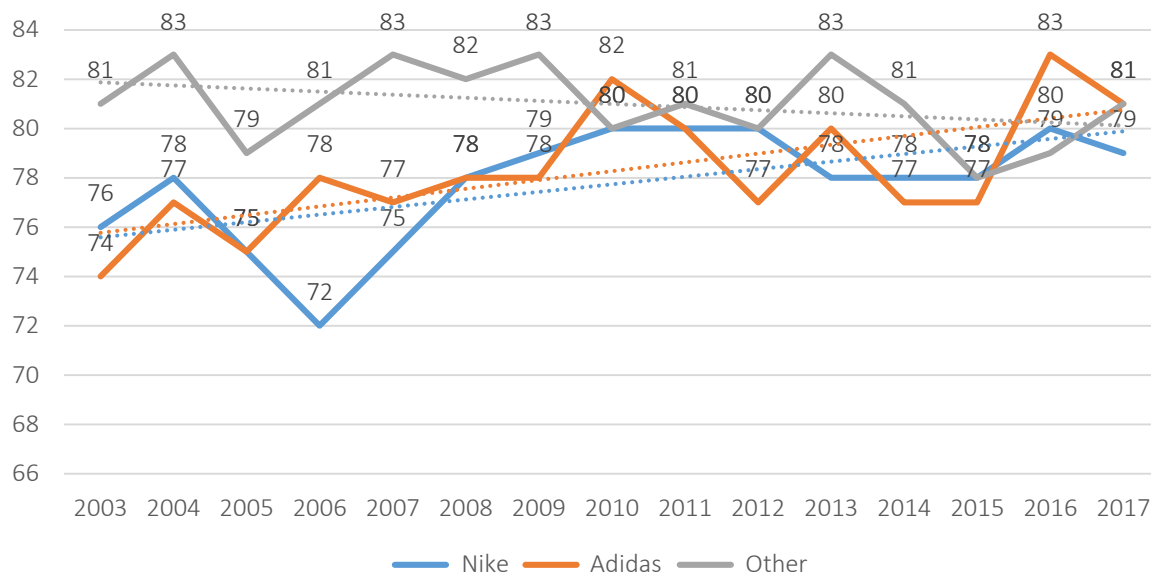
Figure 3. The index of satisfaction of American consumers
by the companies of sports footwear in the USA, 2003–2017

Let's take the index of satisfaction of American consumers by the company Nike as Y. Then we obtain at first two single-factor regressive models:

$$Y = f(X_1) \text{ and } Y = \varphi(X_2),$$

where X_1 – marketing costs of the company Nike on creating demand, in billions of USA dollars, X_2 – incomes of the company Nike, in billions of euros.

The econometric multi-factor model will have a look of the multiple regression equation, in which the average expected value of the regression Y is a linear combination of several factors X_j:

$$Y = a_0 + a_1 X_1 + a_2 X_2 + u,$$

where u is the value of the random (stochastic) factor.

In this equation, each coefficient $a_j (j \neq 0)$ is a partial regression coefficient that characterizes the sensitivity of the value of Y to the change in factor X_j – the effect of an increase on one unit in the value of the variable X_j to the change of the conditional mathematical expectation Y (in certain units of measurement), when all other variables are considered to be constant.

Partial coefficients of elasticity characterize the influence of individual factors: on how much % will the regression Y change, if the value of one of the factors X_j grows on 1% in the conditions of the invariance of another factor. So, it becomes possible to determine the most and least influential explanatory factors, to the change of which among them the dependent factor Y is more sensitive or more stable, inertial.

Determination coefficient R^2 is the main indicator of the quality of the regression equation and determines the nature of the change impact for the values of the factors of the calculated model on the variable Y – on how many percent of the regression equation explains the behavior of the regressant Y and the value $(1 - R^2)$ respectively – how many percent are the factors not taken into account in the model (Vitlinsky & Shatarska, 2012).

Econometric model No. 1. So there are two data sets for research: index of the satisfaction of American consumers and costs of the company Nike on creating demand: $Y = f(X_1)$.

Accurate real statistic is known for the period 2003–2016. Let's build first the correlation field for X_1 and Y, this is made for demonstrating their dependence on each other. This can be seen on Figure 4.
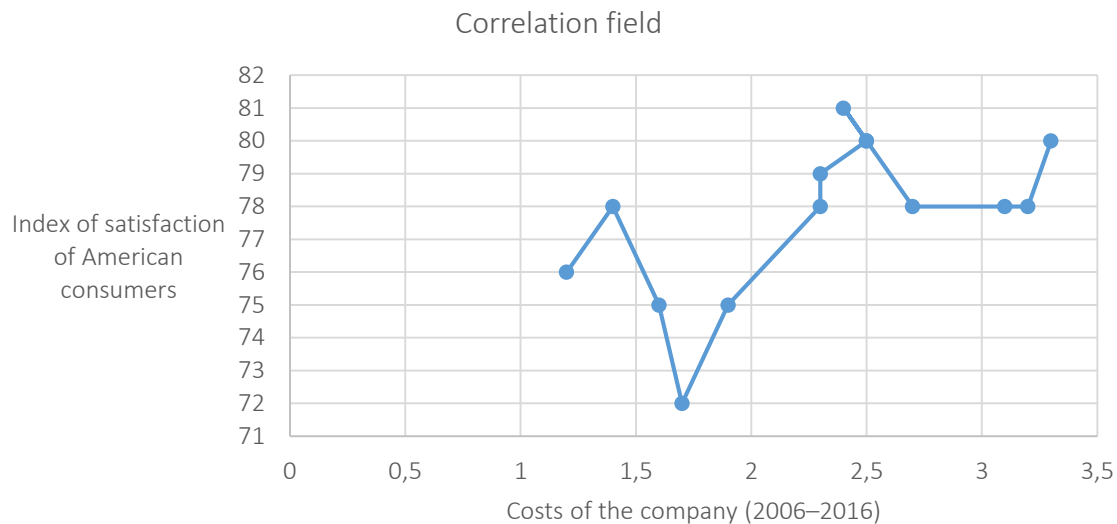
Correlation field

Figure 4. Correlation field for the index of satisfaction
of American consumers and costs on marketing by Nike

Let's build, for example, four lines of trend: linear, polynomial, exponential and power. On their basis, an equation for determining the predictive value of the index can be selected. They can be seen on Figures A1, A2, A3, A4 in Appendix.

We select the linear and polynomial trends for the indicator index calculations, because they have the largest level of reliability R^2:

• forecast for a linear trend: $Y = 79,70481$;

• forecast for a quadratic trend: $Y = 79,24768$.

In this case, the value $\left(1 - R^2\right)$ shows that more than 60% percent of the model go to the not taken into the account factors, in other words, the statistical significance of the received predictions is not high and relying only on them in the process of developing a strategic decision means to be exposed to high risk.

Econometric model No. 2. We select two sets of data for the research of their connection: index of satisfaction of American consumers by the footwear of the company Nike and income of the company from the year 2006 to the year 2017:
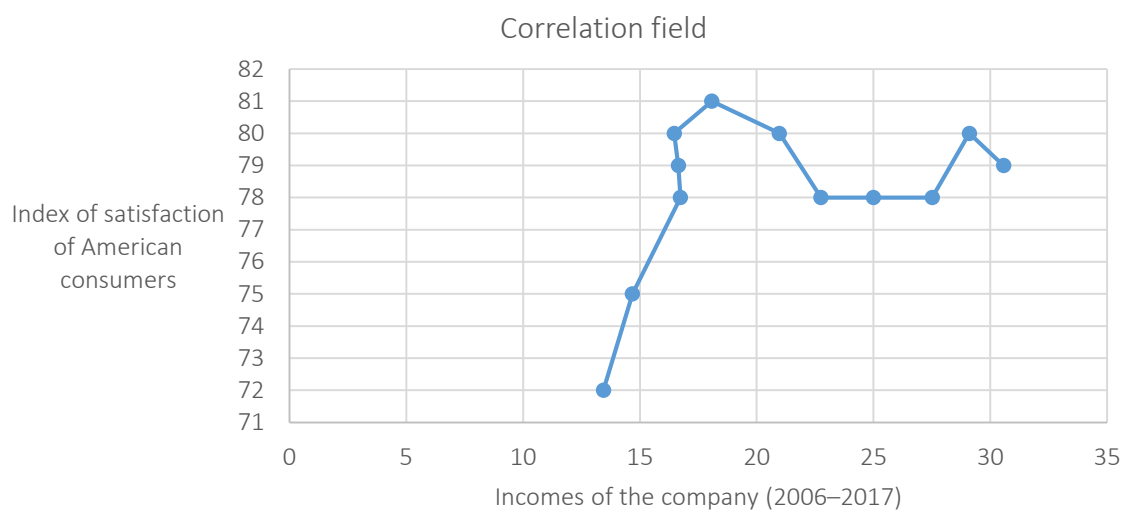
Correlation field

Figure 5. Correlation field of interconnection of the index of satisfaction of American consumers with
the company Nike and its incomes, in the period 2006–2017

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$$Y = \varphi(X_2).$$

$$E_{Y/X_1} = 0.3428,$$

$$E_{Y/X_2} = -0.19672.$$

Using the same scheme as for the model No. 1, we build graphs of the correlation field and trends: linear and polynomial. The two other trends will also not be used for the calculations of the forecast values of the index. The value of the index we take from Figure 3 and the values of the incomes of the company Nike we take from Figure 1.

The value of the determination coefficients R^2, as of the main indicator of the reliability of the regression equality, built trends of the variable Y, are different in a quit substantial way. That's why such a discrepancy exists in the calculated with the help of linear and quadratic trends values of forecasts of consumer satisfaction index.

- forecast by the linear trend: $Y = 80,1736$;

- forecast by the quadratic trend: $Y = 76,757$.

Econometric model No. 3. Multi-factor regression model: $Y_3 = F(X_1, X_2)$.

Due to the fact that there are only two known factors in the case of this concrete statistic, the model of theoretical multi-factor linear regression for Nike will have the look:

$$Y = a_0 + a_1 X_1 + a_2 X_2 + u,$$

The calculated dependency model:

$$Y = 66.68 + 10.554 X_1 - 0.763 X_2, \quad R^2 = 0.53,$$
$$F = 4,5815.$$

According to this model with two factors, the behavior, the change of values of the regressant Y by 53% is formed by the change in regressor's values. If for other companies we increase the number of factors, then the behavior of the variables will be forecasted even more. So, the model in this situation will come even closer to the "ideal" one.

By the way, according to the calculated values of the coefficients of elasticity the factor $\mathbf{X}_1$, which is marketing costs of the company Nike for creating demand in billions of dollars, happens to be a more influential as a factor.

We found that the growth of the costs of company Nike on creating demand by 1% increases the index of satisfaction of American consumers by 0.34%. And the growth of the income of Nike by 1% reduces the index of satisfaction of consumers by 0.2% (which is negligible). If the necessary statistical data for companies Adidas and Puma were available, it would be possible to calculate the analogous econometric models.

The prediction of the index of satisfaction of American consumers with sport footwear of the company Nike will be based on this model, using the smoothing methods, named as sliding average and exponential smoothing, for possible future values of regressors X_1 and X_2.

Method of sliding average $MA(m)$ is one of the easiest methods of forecasting and has become widespread for short-term forecasting:

- smoothing with the help of sliding average is based on the idea that in the average values the random deviations are mutually extinguished;

- the trend got with the help of the sliding average doesn't have a quantitative expression, in other words, the speed of change of the range is unknown;

- the predicted value of f_n (1) for one period of prepossession is responsible the last smoothed value of $\hat{y}_{n-k}$, which was calculated as a sliding average of m order in m last data of the time range.

The method of exponential smoothing gives a possibility to describe such a development process, when the largest weight is given to the last observation and the weight of the remaining observations decreases geometrically. Calculated in the result of this mathematical mean more characterizes the value of the process in the end of the interval of smoothing, than at its beginning and is known as an exponentially weighed average.
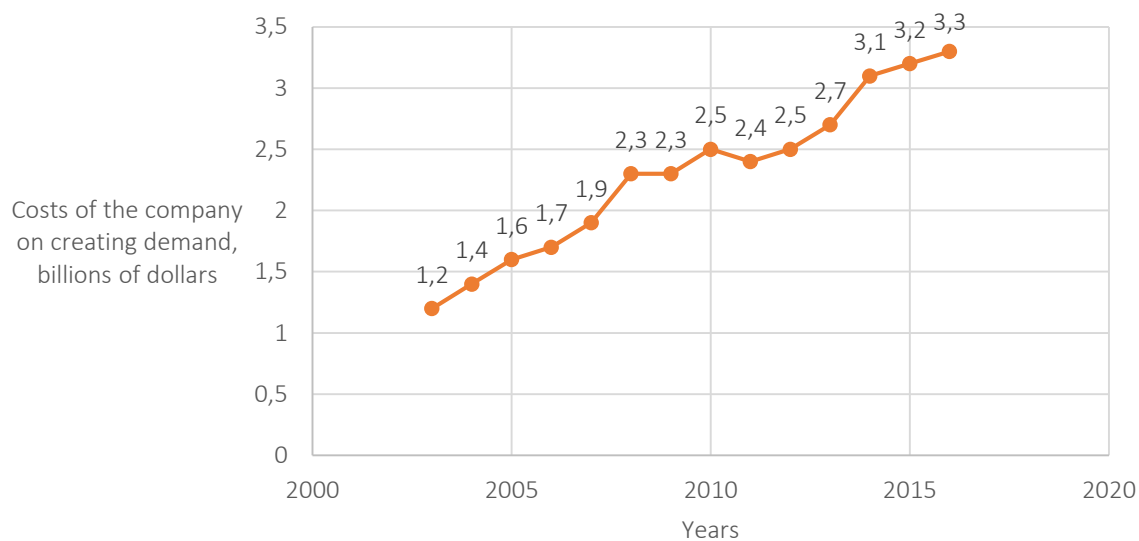
Figure 6. Costs on creating demand by the company Nike, in billions of dollars

- the practical calculation of the exponential average is done by the recurrent formula:

$$\hat{y}_{t+1} = \alpha y_t + (1-\alpha)\hat{y}_t \text{ or } \hat{y}_{t+1} = \hat{y}_t + \alpha(y_t - \hat{y}_t),$$

in other words, in the calculation of the new exponential average the previous exponential average and the fraction α from the difference between the previous observation and its smoothed value are used, that means the errors $u_t = y_t - \hat{y}_t$. Thus, with the arrival of the new observation y_n, the forecast $f_n(1)$ is being made as an exponential average $\hat{y}_{n+1}$ of the next value y_{n+1}, and the parameter α is chosen from the condition of the minimum observational error of the forecast (In the calculations the parameter $(1-\alpha)$ is a "factor of attenuation").

- the mathematical expectations of the time range y_t and the exponentially smoothed range $\hat{y}_t$ are the same, and the variance of the smoothed levels becomes smaller than the variance of the starting range of observations;

- the exponential average plays the role of the filter, which absorbs the oscillation of the time range.

Next, we calculate the predictive values for each indicator Y, X_1, X_2 using the methods of smoothing average and exponential smoothing. After this, it will be necessary to select the most perspective values of the model.

By the method of smoothing average, the forecasted value $Y = 79.5\%$.

Mean squared error of the forecast (RMSE) = 0.79.

By the method of exponential smoothing with attention factor 0.9, the forecasted value $Y = 77.86108\%$.

Mean squared error of the forecast (RMSE) = 1.6601.

By the method of exponential smoothing with attention factor 0.1, the forecasted value $Y = 79.08$.

Mean squared error of the forecast (RMSE) = 1.2426.

As we see in Figure 6, with every year the size of costs of the company Nike on creating demand are growing gradually from year to year.

By the method of smoothing average, the forecasted value $X_1 = 3.25$ billions of US dollars.

Mean squared error for the forecast (RMSE) = 0.05.

Also, by the method of smoothing average, the forecasted value $X_1 = 3.2$.

Mean squared error for the forecast (RMSE) = 0,2317.

By the method of exponential smoothing, the forecasted value $x_1 = 3.2886$.

Mean squared error of the forecast (RMSE) = 0.2648.

Also, by the method of exponential smoothing, the forecasted value $x_1 = 2.2412$.

Mean squared error of the forecast (RMSE) = 1,1969.

By the method of smoothing average, the forecasted value $X_2 = 29.835$.

Mean squared error of the forecast (RMSE) = 0.766.

By the method of exponential smoothing, the forecasted value $X_2 = 30.4043$.

Mean squared error of the forecast (RMSE) = 2,1504.

So, we get the best forecasts using the multi-factor econometric model:

$$Y = 66.68 + 10.554 \cdot X_{1\,forecasted} - 0.763 \cdot X_{2\,forecasted}.$$

Index forecast

$$Y_{forecasted} = 66.68 + 10.554 \cdot 3.23 - 0.763 \cdot 30.1 = 77.8031\,(\%)$$

$$X_{1\,forecasted} = 3,25 \text{ billions of dollars,}$$

$$\tilde{O}_{2\,forecasted} = 30,4043 \text{ billions of euros,}$$

$$Y_{forecasted} = 79.5\%, \text{ using the methods of smoothing.}$$

After building the single-factor and multi-factor econometric models on the example of the company Nike, it can be confidently said that with the increase of factors from one to two the power of the model and its reliability have increased. A small number of factors was used because of the secrecy of Nike's business statistics and the lack of many statistic data in open access. With the further increase of the factors X_m it will become possible to bring the power of the model to more than 90%.

In practice, firms, which will be using the model of the multi-factor linear regression, will be able to substitute all existing in their financial reports data into it and will be able to change the influence of the econometric model to maximum indicators of effectiveness. The more factors will be used in the model, the smaller will be the risk. Also, the more factors will be calculated in the econometric model the closer "rational" system of global marketing communications will become to the "ideal".

Based on the mathematical researches, made above it can be affirmed that the model of the "rational" system of global marketing communications can be built with the equation:

$$Y = a_0 + a_1 X_1 + a_2 X_2 + \ldots + a_m X_m + u,$$

where $X_1, \ldots X_m$ – statistical values of factors mainly of the marketing nature, which are taken into consideration and affect the development of the company, u – value of the random (stochastic) factor.

Deviation of the "rational" system of global marketing communications from the "ideal" should not exceed 10%, so that level of rationality was able to remain high.

The main meaning of this model lies in the thought that it is necessary not only to minimize the risks. It is unreal to get rid of them completely, that's why companies should know how to forecast them. If the economically unwanted events still happen, then the counter-measures are required. One can draw an analogy with the seismological situation in Japan, where earthquakes are a regular event. It is impossible to get rid of this natural phenomenon on that geographical territory, but fast reacting and minimization of the consequences of the disaster – it is still real. The same can be said about the negative occurrences in conducting marketing activity by companies.

The usage of the founded model doesn't depend on the country, in which the enterprise is situated, or on the economic situation in this country. It makes this model's usage possible both in developed countries of Europe, Asia, America and Australia and in economically unstable states,

such as Ukraine. The significance of the model lies in the fact that with its help in every country of the world company will be able to select the priority directions for the amplification of its marketing communication and will be able to create its own unique set of rational factors for coming closer to the "ideal" system of global marketing communications.

Thereby, it will be possible to choose what channel of marketing communications is the most significant, in the condition if accurate statistic data of its usage by the company is available. The fact that the model can be applied in different states, which are not similar to each other in the ways they conduct business and in common marketing strategies for international firms, makes it universal. Countries differ from each other cultural traditions and economic situations, but due to the facts that various factors can be included to the model and that they can be replaced, in the result of the econometric research an effective means of the synergic organization for communicational activities was received. This approach involves combining the influence of different factors on the general object of consideration. In this case it is the impact of diversified types of marketing activity and reduction of the riskiness of the process of entrepreneurship in order to have an effect on the performance of business by individual global companies.

All the required data for such analysis with the usage of the developed model can be obtained in the financial statements of enterprises.

3. DISCUSSION

The significance of the received results lies in the direction of continuing the development of the theoretic background for the creation of the better working conditions for European and American enterprises, including companies from Ukraine. The improvements to the ideas of previous researchers include the systematization of their knowledge, formulation of the definition for the "rational" system of global marketing communications and the explanation of its difference from the "ideal" system. It also opens new possibilities for the scientific generalization in the field of risk preventing.

The perspectives of further research of this topic are in the studying of the impact, which "rational" system of global marketing communications, as a transitional unit to the "ideal" system, will bring to international marketing and international economy. With a detailed approach to analytics application of the econometric model of the "rational" system of global marketing communications can do a breakthrough in the development of international companies with the use of real minimization of marketing risks.

CONCLUSION

The use of the "rational" system of global marketing communications for Ukrainian enterprises would simplify the identification of risks and matching the performed work with resultativity, which it brings. Due to the fact that the structure of communications management is unstable and irregular in Ukraine, the usage of the model can increase quickly the effectiveness of the communicational activity and bring the existing system of global marketing communications closer to the "ideal" one. The creation of the "ideal" system of global marketing communications is impossible, but the "rational" model can help to achieve the results which are close to the perfect match.

For marketing management and its control, the "rational" system of global marketing communications opens the ability to accurately calculate the effectivity of separate components in the general process of creating the reputation of the brand. This method of risk minimization is affordable if the information about the necessary factors exists. Management of global marketing communications in international enterprises with the use of the "rational" system occurs in the most effective way, because the elimination of the potential disadvantages becomes real.

The econometric models which describe the "rational" system of global marketing communications can be used in future by real companies conducting trading activity on the international arena. In the case of the internal data from business reports possession, one can combine various factors in the multifactor model and create a system of communications approximated to the "ideal". The more factors are taken into account during the analysis, the larger is the chance to benefit from all the available resources for the fabrication of the most "rational" system of global marketing communications. The model should work as the mechanism of checking which factors can be destructive for the development of the company and which can be successful. All the other components of marketing should be used simultaneously with it.

REFERENCES

1. Aven, T. (2016). Risk assessment and risk management: review of recent advances on their foundation. *European Journal of Operational Research, 253*(1), 1-13. https://doi.org/10.1016/j.ejor.2015.12.023

2. Babatunde, O. (2015). Importance of Effective Communication in Public Organisations. *Issues in Social Science, 3*(2), 78-89. https://doi.org/10.5296/iss.v3i2.8596

3. Barybina, Y. O. (2015). Комунікаційна політика крупноформатних підприємств торгівлі [Komunikatsiina polityka krupnoformatnykh pidpryiemstv torhivli]. *Economic Forum, 2,* 173-180. Retrieved from http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?I21DBN=LINK&P21DBN=UJRN&Z21ID=&S21REF=10&S21CNR=20&S21STN=1&S21FMT=ASP_meta&C21COM=S&2_S21P03=FILA=&2_S21STR=ecfor_2015_2_30

4. Beakbane, T. (2003). *Preparing the Perfect Communications Brief* (Beakbane Marketing Inc.). Retrieved from http://www.beakbane.com/wp-content/uploads/2014/02/OriginalBriefing.pdf

5. Braumann, E. C. (2018). Analyzing the Role of Risk Awareness in Enterprise Risk Management. *Journal of Management Accounting Research, 30*(2), 241-268. http://dx.doi.org/10.2308/jmar-52084

6. Brayant, A. (2014). Nike's Demand Creation, In Billions. *Infogram. Com*. Retrieved from https://infogram.com/nikes-demand-creation-in-billions-1gk92edx5vlnp16

7. Bromiley, P., McShane, M., Nair, A., & Rustambekov, E. (2015). Enterprise Risk Management: Review, Critique and Research Directions. *Long Range Planning, 48*(4), 265-276. https://doi.org/10.1016/j.lrp.2014.07.005

8. Fill, C., & Jamieson, B. (2006). *Marketing Communications*. Great Britain: Edingburgh Business School, Heriot-Watt University. Retrieved from https://www.ebsglobal.net/EBS/media/EBS/PDFs/Marketing-Communications-Course-Taster.pdf

9. Göransson, K., & Fagerholm, A-S. (2018). Towards Visual Strategic Communications: An Innovative Interdisciplinary Perspective on Visual Dimensions Within the Strategic Communications Field. *Journal of Communication Management, 22*(1), 46-66. https://doi.org/10.1108/JCOM-12-2016-0098

10. Gorzen-Mitka, I. (2017). The Evolution of Risk Management Research: Changes in Knowledge Maps. *Problems of Management in the 21st Century, 12*(2), 106-121. Retrieved from https://www.scientiasocialis.lt/pmc/?q=node/154

11. Handley, L. (2017). *While the Advertising World Goes Digital, Some Brands Are Still Sticking to Analogue Ads*. Retrieved from https://www.cnbc.com/2017/04/18/the-advertising-world-goes-digital-but-luxury-brands-spend-on-print.html

12. Hmarska, I. A. (2011). Сутність та значення комплексу маркетингових комунікацій підприємств [Sutnist ta znachennia kompleksu marketynhovykh kommunikatsii pidpryiemstv].

Visnyk Khmelnytskoho Natsionalnoho Universytetu, 6(2), 114-118. Retrieved from http://journals.khnu.km.ua/vestnik/pdf/ekon/2011_6_2/114-118.pdf

13. Iacob, V.-S. (2014). Risk Management and Eveluation and Qualitative Method Within the Projects. *Ecoforum Journal, 3*(1), 60-67. Retrieved from https://ideas.repec.org/a/scm/ecofrm/v3y2014i1p10.html

14. Investors (2016). *NIKE, INC. Reports Fiscal 2016 Fourth Quarter and Full Year Results*. Retrieved from http://investors.nike.com/investors/news-events-and-reports/investor-news/investor-news-details/2016/NIKE-Inc-Reports-Fiscal-2016-Fourth-Quarter-and-Full-Year-Results/default.aspx

15. Ionescu, A., & Dumitru, N. R. (2011). Global Communication Techniques to be Applied By Multinational Companies. *Romanian Economic and Business Review, 6*(4), 84-92. Retrieved from https://econpapers.repec.org/article/raujournl/v_3a6_3ay_3a2011_3ai_3a4_3ap_3a84-92.htm

16. Junior, R. R., & Carvalho, M. M. (2013). Understanding the Impact of Project Risk Management on Project Performance: An Empirical Study. *Journal of Technology Management & Innovation, 8,* 64-78. https://doi.org/10.4067/S0718-27242013000300006

17. Leppaniemi, M. (2008). *Mobile Marketing Communications in Consumer Markets*. Department of Marketing, University of Oulu. Retrieved from http://jultika.oulu.fi/files/isbn9789514288159.pdf

18. Lesko, C. Jr., & Hollingsworth, Y. A. (2011). A New Approach to Communications Management Planning Through 3D Web and Semantic Web Technologies. *Journal of Management and Strategy, 2*(3), 25-34. https://doi.org/10.5430/jms.v2n3p25

19. Markillie, P. (2004). A Perfect Market. *The Economist*. Retrieved from https://www.economist.com/node/2646107

20. Mnkandla, E. (2013). A Review of Communication Tools and Techniques for Successful ICT Projects. *The African Journal of Information Systems, 6*(1), 1-8. Retrieved from https://www.researchgate.net/publication/259716668_A_review_of_Communication_Tools_and_Techniques_for_Successful_ICT_Projects

21. Mohammed, H. K., & Knapkova, A. (2016). The Impact of Total Risk Management on Company'S Performance. *Social and Behavioral Sciences, 220,* 271-277. https://doi.org/10.1016/j.sbspro.2016.05.499

22. Monllos, K. (2018). The Billboard Industry Thanked '3 Billboards' Using '3 Billboards-Inspired Billboards. *Adweek. Com*. Retrieved from http://www.adweek.com/brand-marketing/the-billboard-industry-thanked-3-billboards-using-3-billboards-inspired-billboards

23. Newman, A. (2016). Communication Planning: A Template for Organizational Change. *Cornell Hospitality Report, 16*(3), 3-6. Retrieved from https://scholarship.sha.cornell.edu/chrreports/5/

24. Podsada, R. (2014). *Employee Recruitment: Branding and Marketing Isn'T Just for Sales.*

25. Powell, S. (2015). *What Does the Perfect Internet Marketing System Look Like for Remodelers?* Retrieved from https://www.remodelersadvantage.com/perfect-internet-marketing-system-remodelers/

26. Prostova, O. I. (2012). Інноваційні методи маркетингових комунікацій та перспективи їх використання в політичній практиці [Innovatsiini metody marketynhovykh kommunikatsii ta perspektyvy ikh vykorystannia v politychnii praktytsi]. *Naukovi Pratsi Chdu im. P. Mohyly, 185*(197), 28-32. Retrieved from http://politics.chdu.edu.ua/article/download/75700/71247

27. Prymak, T. O. (2011). Маркетингові комунікації: особливості підготовки фахівців [Marketynhovi komunikatsii: osoblyvosti pidhotovky fakhivtsiv]. *Marketynh v Ukraini, 4,* 46-52. Retrieved from http://nbuv.gov.ua/UJRN/Mvu_2011_4_10

28. Raupp, J., & Hoffjann, O. (2012). Understanding Strategy in Communication Management. *Journal of Communication Management, 16*(2), 146-161. https://doi.org/10.1108/13632541211217579

29. Ridha, M. B., & Alnaji, L. (2015). Analysis and Measurement of Risks in Business: A Case Study on The Jordan Valley Authority. *European Journal of Business and Management, 7*(9), 9-20. Retrieved from https://www.semanticscholar.org/paper/Analysis-and-Measurement-of-Risks-in-Business%3A-A-on-Ridha-Alnaji/77474988c9310645b03ad8da9542dbcd58353436

30. Shonubi, A. O., & Akintaro, A. A. (2016). The Impact of Effective Communication on Organizational Performance. *The International Journal of Social Sciences and Humanities Invention, 3*(3), 1904-1914. Retrieved from https://www.academia.edu/33261912/The_Impact_Of_Effective_Communication_On_Organizational_Performance

31. Skrynkovsky, R. M., Bochko, O. Y., & Haruk, K. B. (2016). Практичне застосування інтерактивних маркетингових комунікацій підприємствами [Praktychne zastosuvannia interaktyvnykh marketynhovykh komunikatsii pidpryiemstvamy]. *Globalni Ta Nazionalni Problemy Ekonomiky, 10,* 512-515. Retrieved from http://global-national.in.ua/archive/10-2016/106.pdf

32. Statista (2017a). *Adidas, Nike, & Puma Revenue Comparison 2006–2017*. Retrieved from https://www.statista.com/statistics/269599/net-sales-of-adidas-and-puma-worldwide/

33. Statista (2017b). *Customer Satisfaction Athletic Shoes (Adidas, Nike Etc.) in the U.S.A. from 1997 to 2018*. Retrieved from https://www.statista.com/statistics/195009/customer-satisfaction-with-us-athletic-shoes-since-1997

34. Statista (2019). *Digital Advertising*. Retrieved from https://www.statista.com/outlook/216/100/digital-advertising/worldwide#market-revenue

35. Stelmah, O. O. (2006). *Інтерактивні маркетингові комунікації в менеджменті підприємства [Interaktyvni marketynhovi kommunikatsii v menedzhmenti pidpryiemstva]* (Ph.D.). Donetsk State University of Economics and Trade named after M. Tugan-Baranovskiy.

36. Tariszka-Semegine, E. (2012). Organizational Internal Communication as a Means of Improving Efficiency. *European Scientific Journal, 8*(15), 86-96. Retrieved from https://eujournal.org/index.php/esj/article/view/232

37. ThanhThuy, N. (2014). *Branding and Integrating Marketing Communications to Strengthen Brand*. Lahti University of Applied Sciences. Retrieved from https://www.theseus.fi/bitstream/handle/10024/72433/Nguyen_Thanh_Thuy.pdf?sequence=2&isAllowed=y

38. Valackiene, A. (2010). Efficient corporate communication: decisions in crisis management. *Engineering Economics, 66*(1), 99-110. Retrieved from http://inzeko.ktu.lt/index.php/EE/article/view/11657

39. Vitlinsky, V. V., & Shatarska, I. F. (2012). *Taking Rational Marketing Decisions Considering Quantitative Evaluation of Risks* (pp. 93-97). Digest of scientific materials of the VI International School Symposium "AMUR-2012".

40. Wissem, E. (2013). Risks Management: New Literature Review. *Polish Journal of Management Studies, 8,* 288-297. Retrieved from https://econpapers.repec.org/article/pczjournl/v_3a8_3ay_3a2013_3ai_3a1_3ap_3a288-297.htm
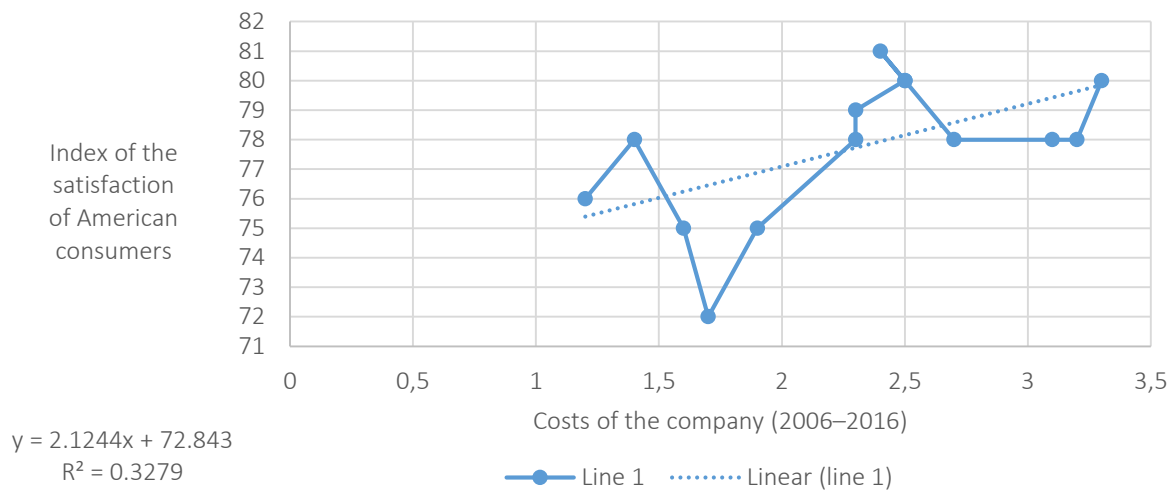
APPENDIX A

$y = 2.1244x + 72.843$
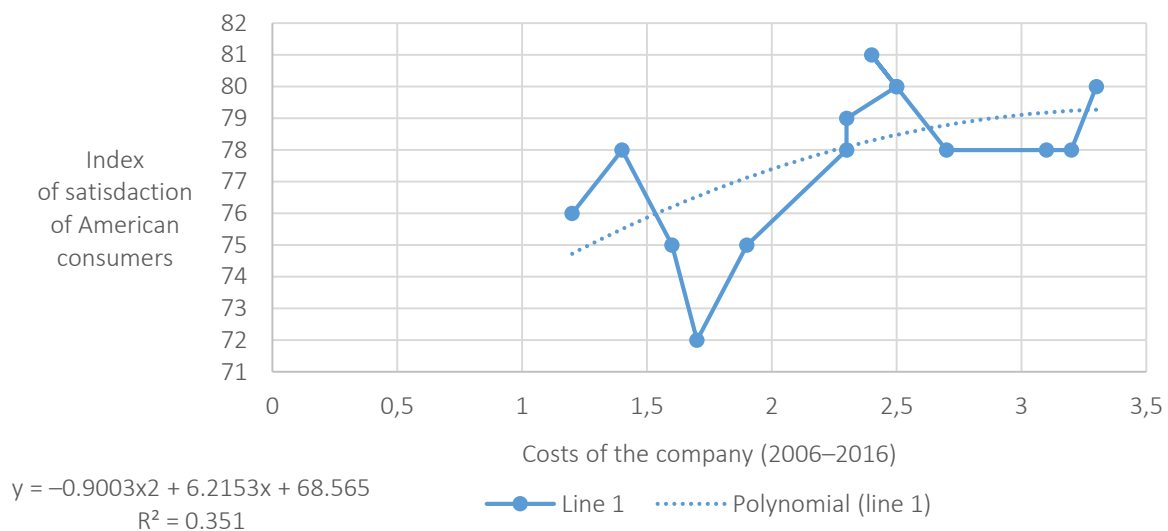$R^2 = 0.3279$

Figure A1. Linear trend for Nike

$y = -0.9003x^2 + 6.2153x + 68.565$
$R^2 = 0.351$

Figure A2. Polynomial line trend for Nike

$y = 72.902e^{0.0277x}$
$R^2 = 0.3268$

Figure A3. Exponential line trend for Nike

y = 74.144x0.0592
R² = 0.331

Figure A4. Power line trend for Nike

y = 0,1778x + 74,434
R² = 0.1783

Figure A5. Linear trend for the company Nike
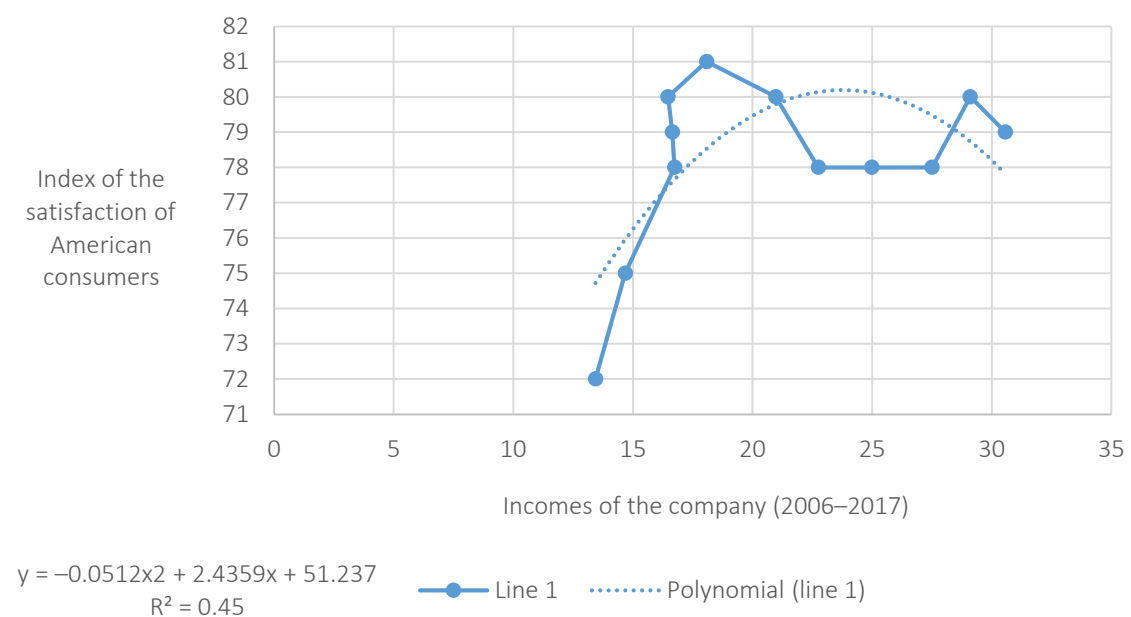

y = −0.0512x2 + 2.4359x + 51.237
R² = 0.45

Figure A6. Polynomial trend for the company Nike