ISSN 1392-1142
ORGANIZACIJŲ VADYBA:
SISTEMINIAI TYRIMAI: 2009.49

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Multiple Criteria Assessment of Socioeconomic Indicators Influencing the Company's Marketing Decisions

The paper reviews the principles and models of complex qualitative and quantitative assessment of significant socioeconomic indicators influencing the company's marketing management decisions. The essential steps of assessment are the identification and expert evaluation of identified indicators, also the quantitative assessment groups of indicators and macroeconomic environment on the basis of the method multiple-criteria evaluation.

Keywords: macroeconomic indices, socioeconomic indicators, groups of indicators, formalisation, marketing decisions, quantitative assessment, multiple-criteria evaluation.

Straipsnyje pristatomi socioekonominių indikatorių, turinčių itaką įmonės marketingo sprendimams, kompleksinio kokybinio ir kiekybinio vertinimo principai ir modeliai. Vertinimas apima socioekonominių indikatorių (įskaitant makroekonominius rodiklius) identifikaciją, ekspertinį jų vertinimą ir kompleksinį kiekybinį šių indikatorių grupių bei makroekonominės aplinkos vertinimą, taikant daugiakriterinio vertinimo metodą.

Raktiniai žodžiai: makroekonominiai rodikliai, socioekonominiai indikatoriai, indikatorių grupės, formalizacija, marketingo sprendimai, kiekybinis vertinimas, daugiakriterinė analizė.

Introduction

The research and evaluation of marketing macro-environment intend to gain the increasing significance; first of all when validating the strategic marketing management decisions. In the context of tight competition, it is necessary to search for new original marketing management decisions and to align the marketing strategies with new challenges (Dibb, 2002; Webster, 2005; Kotler and Keller, 2006; Urbonavičius et al., 2007). The complex investigations of marketing macro-environment are necessary to validate these decisions when implementing the concept of sustainable business development and making the strategic decisions environment-friendly (environmental management). Among them is the research (and evaluation) of marketing political (and/or legal), economic, social and technological environment increasingly important due to the particularly dynamic changes of en-

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vironment components, by determining new opportunities and threats. It helps to reduce negative effect of environment changes and often to use these changes (together with the revealed new opportunities) to acquire (or retain) competitive advantage of a company (see Hao, 2000; Kotler et al., 2001; Fleisher, 2003; Hair et al., 2003; Malhotra, 2003; Kozlinskis et al., 2006; Verdu et al., 2006). It is also important to underline, as revealed by B. Smith (2003), C. S. Fleisher (2003), that the research of marketing environment in general must have an aim to make scope, contents, methods and, finally, the results of a research should help a company to improve the effectiveness of the value added development. The marketing researches fall to the category of so-called downstream sources of the value added. This fact, in turn, determines a huge variety of analysed indicators, thus it correspondingly requires a sophisticated theorethical and methodological potential.

Certainly, the qualitative analysis of marketing environment components (both micro and macro) as well as economic and social environment is the most frequent between the marketing research and evaluation methods. It can be considered rather as a certain initial stage of quantitative evaluation. The following qualitative methods must be mentioned in the review of the analysis methods: PEST, PESTEL, environment dynamics analysis and scenario analysis (Kotler, 2003; Walsh, 2005; Vasiliauskas, 2007). The qualitative analysis is also related to the SWOT analysis, which reveals the company's opportunities and threats interconnected with significant external factors. Firstly, it manifests itself from the strategic perspective (either in its expansion or narrowing). It also improves the opportunities to strive at compatibility of strategic marketing management decisions (both at their formation and implementation stages) with socioeconomic indicators and its changes. Undoubtedly, these are important elements of marketing research for any company, and it is one of the most important marketing functions of a company as highlighted by Kotler et al., 2003; Žvirblis, 2005; Moffett et al., 2006; Urbonavičius et al., 2008. When analysing the environment of productive companies, it is important to distinguish trends, to determine the macroeconomic and institutional indicators influencing export strategy of a company as well as the forecasted market's potential (Barnett, 1988). Identified and adequate set of main indicators must be developed for an investigated company business situation. Experts must be usually distinguish the indicators with a forecasted positive effect, also the factors with a forecasted negative effect and a comparative strength of distinguished factors (e.g. highly favourable, medium favourable, unfavourable, highly unfavourable, etc.) as well as trends (or directions) of their change.

Lately, it is highly stressed how promising the quantitative evaluation is in general; therefore, the objectives of its application in evaluation of marketing macro-environment components are also relevant (Žvirblis, 2005). After all, only this evaluation (applying quantitative methods and creating algorithms for the evaluation process) may be incorporated into the general system of evaluation of strategic marketing management decisions. It is necessary to formulate conceptual principles and general models for quantitative evaluation of socioeconomic indicators (Žvirblis, 2005; Buračas, 2004). In the most general form, they would express the dependence of compound va-

riables (describing both a corresponding set of indicator parameters, their changes and the direction of changes, cf. Buračas, 2007), which mark macroeconomic environment, its influence on the identified dynamic factors determining them. Thus further analytic research is necessary to solve the problem related to evaluation of socioeconomic indicators; the theoretical basis must be oriented towards preparation of evaluation methods, *inter alia* considering the principles of functioning of long-term computer aided marketing systems.

The research object: the marketing macroeconomic environment as a complete set of essential socioeconomic and institutional indicators (including macroeconomic indices).

The goal of this research is to design measurement system, i.e. principles and basic models, for complex assessment of socioeconomic indicators influencing company's marketing decisions.

Research methods: the systemic review of scientific publications, analysis of quantitative evaluation methods, scenarios method, multiple-criteria evaluation *Simple Additive Weighting* (*SAW)* method, the *Complex Proportional Assessment (COPRAS)* method.

The main principles and basic models for the complex assessment of socioeconomic indicators

The formalisation of socioeconomic indicator groups (determined by respective sets of indicators) and macroeconomic environment as a composition of its indicator groups should be the basis for quantitative assessment. Thus development of respectively formalised (in the most general form) assessment models is among the essential conditions. The development of such models is determined both by the specifics of respective methods of quantitative assessment and by the manner of their adjustment to company's business situations. Since the principles of versatility, particularity and reliability of assessment are important when validating and making strategic marketing management decisions**,** among them concerned with growth of company's market share, realisation of promotion function, production development, and increase in export potential. The quantitative assessment of socioeconomic indicators must also follow these principles. Clearly the formalisation is based on the principles of formalisation of marketing macro-environment components (Žvirblis, 2008).

This corresponds to an offered three-stage qualitative assessment system. The system must be open, i.e. a possibility to include additionally the specific primary indicators must be foreseen. An assessment comprises the design of scenarios interpreting the government macroeconomic policy trends, perspectives of state economic development and variants of marketing management decisions. Their forecasting and evaluation of the influence is also important to the business subjects in the transitional period. There are oriented towards the results of quantitative evaluation, which help to determine the most favourable ones from the available variants. Thus the prepared methodology is an important tool to grant the complex theoretical validation of strategic management decisions.

An essence of three-stage system of quantitative assessment developed below is provided in the following consequence:

- the identification and expertised

assessment of socioeconomic indicators determining the objective groups of indicators;

- the assessment of groups of indicators according to their determination using a compound index for each of them;
- the assessment of macroeconomic environment (as a composition of indicator groups) applying the level index as a complex measure.

The basic formalised models for quantitative assessment of indicator groups (included group of economic indicators, group of social indicators, group of export-import indicators as well as group of legal indicators) were developed on the bases of these principle provisions as the following general matrix expressions.

For evaluation of a group E of economic indicators:

$$E\left(E_1, E_2, ..., E_n, \right)=\begin{bmatrix} b_{11} & b_{12} & ... & b_{1n} \\ b_{21} & b_{22} & ... & b_{2n} \\ ... & ... & ... & ... \\ b_{n1} & b_{n2} & ... & b_{nn} \end{bmatrix}\begin{bmatrix} E_1 \\ E_2 \\ ... \\ E_n \end{bmatrix}, \quad (1)$$

here b_{11}, b_{12}, ..., b_{nn} are the significance parameters of the economic indicators' influence E_1, E_2, ..., E_n on the compound variable E.

For evaluation of a group S of social indicators:

$$S\left(S_1, S_2, ..., S_n, \right)=\begin{bmatrix} c_{11} & c_{12} & ... & c_{1n} \\ c_{21} & c_{22} & ... & c_{2n} \\ ... & ... & ... & ... \\ c_{n1} & c_{n2} & ... & c_{nn} \end{bmatrix}\begin{bmatrix} S_1 \\ S_2 \\ ... \\ S_n \end{bmatrix}, \quad (2)$$

here c_{11}, c_{12}, ..., c_{nn} are the significance parameters of the social indicators' influence S_1, S_2, ..., S_n on the compound variable S.

For evaluation of a group A of export - import indicators:

$$A\left(A_1, A_2, ..., A_n, \right)=\begin{bmatrix} f_{11} & f_{12} & ... & f_{1n} \\ f_{21} & f_{22} & ... & f_{2n} \\ ... & ... & ... & ... \\ f_{n1} & f_{n2} & ... & f_{nn} \end{bmatrix}\begin{bmatrix} A_1 \\ A_2 \\ ... \\ A_n \end{bmatrix}, \quad (3)$$

here $f_{11}, f_{12}, ..., f_{nn}$ are the significance parameters of the export - import indicators' influence A_1, A_2, ..., A_n on the compound variable A.

For evaluation of a group L of legal environment indicators:

$$L\left(L_1, \mathrm{L}_2, ..., \mathrm{L}_n, \right)=\begin{bmatrix} g_{11} & g_{12} & ... & g_{1n} \\ g_{21} & g_{22} & ... & g_{2n} \\ ... & ... & ... & ... \\ g_{n1} & g_{n2} & ... & g_{nn} \end{bmatrix}\begin{bmatrix} L_1 \\ L_2 \\ ... \\ L_n \end{bmatrix}, \quad (4)$$

here g_{11}, g_{12}, ..., g_{nn} are the significance parameters of the legal indicators' influence L_1, L_2, ..., L_n on the compound variable L.

The model for assessment of macroeconomic environment as a composition of these groups:

$$M\left(E, S, A, L\right)=\begin{bmatrix} k_{e1} & k_{e2} & ... & k_{en} \\ k_{s1} & k_{s2} & ... & k_{sn} \\ k_{a1} & k_{a2} & ... & k_{an} \\ k_{l1} & k_{l2} & ... & k_{\mathrm{ln}} \end{bmatrix}\begin{bmatrix} E \\ S \\ A \\ L \end{bmatrix}, \quad (5)$$

here k_{e1}, k_{s1}, ..., k_{ln-1}, k_{ln} are the significance parameters of direct and interaction impact of respective groups E, S, A, L on the general level M of macroeconomic environment.

The use of the basic assessment models

mentioned before in a specific situation, is related to separation of the significant indicators adequate to the situation, i.e. to identification of indicators and to their primary qualitative analysis. The indicators must be ranked during their identification according to the significance of their influence conditioned by the following main attributes: the level of influence, relevancy to the situation and occurrence of new opportunities or threats.The theoretically based methods for determination of relation between weight coefficients, for ranking (rating scale methods), etc. and concordance model help to grant the objectiveness of the ranking. In any case, the system must retain only these factors that meet the selected level of significance. The identified indicators at first are evaluated by expertise as favourable, unfavourable or neutral according to the level and direction of their influence. The qualitative assessment of the identified indicators using the provided methodology is treated as a preliminary stage.

The preparation of scenarios of every group of indicators as well as the scheming of general macroeconomic environment scenarios is clearly important (Ratcliffe, 2000; 2002). The scenarios of every group must be composed after having evaluated the possible impact of every indicator and their combinations on particular industry (production sector companies) or companies dependent on particular cluster and drafting the possible alteration of impact.

Since both maximising and minimising criteria (indicators) are included, their values must be normalised. Using the provided methodology, as we shall see, a normalisation procedure will not be required in evaluation of macroeconomic environment. Following these provisions, a measure unit and its value must be selected as well for each identified indicator when using the multiple criteria evaluation method. A 10-point system is suggested as below (10 points mark an absolutely favourable effect of an indicator), although a 100-point system is also possible (i.e. an absolutely favourable effect of an indicator would score 100 points). Acceptable is also a non-dimensional expression of this measure (in decimal points). This value, in any case, is determined on the basis of expert evaluation, as it was stressed, applying the special concordance method mentioned before as well. In the outcome of identification and qualitative (expertise) assessment of distinguished primary indicators, the appropriate indicators according to every group (and also corresponding to the designed scenarios of the groups), were conditioned.

The important stage in the complex evaluation is further quantitative assessment of the favourability of macroeconomic environment. First, it must be said that influence of few significant macroeconomic indices on the results of company's activity (total revenue or net profit) and on the market demand can be evaluated using the econometric methods. The regressive analysis is proposed when evaluating the economic efficiency of the activity of company's marketing division (Žvirblis, 2006). This method may be applied for the forecasting the number of possible bancrupts, p. ex., between production companies, depending from the unemployment, total number of national companies' in the country, growing amount of direct foreign investments (Juchno and Tvaronavičienė, 2004). However, the econometric methods are not practicable for the complex evaluation of the impact of significant qualitative and quantitative socioeconomic indicators

(including macroeconomic indices) on the company's marketing management strategy.

Thus analyzing the methods of quantitative evaluation, a focus should be given to one of the most perspective quantitative methods i.e. multicriterial evaluation which allows to analyze the suitability of the decisions for business subjects regarding the possibility of the wide spectre of various factors.

Analysis and validation methods of multiple criteria evaluation

The selection of multicriterial evaluation methods depends from the complexity of marketing efficiency tasks and a wide spectre of their evaluation criteria. Many of those perspective methods depend to the group of decision making methods. It is necessary to review the most common *multicriteria analysis* methods and systems classified as those of optimization, ranking, grouping and evaluation. The detailed analysis based on the multiple systemic publications of various foreign and Lithuanian authors permits to take into attention those of the evaluation methods' which may be potentially used more widely for the determining of marketing solutions. First of all we selected the *evaluation* methods group, as the most favourable to the assorted tasks and adequate to the research target (Dombi, Zsiros, 2005). The *Analytical Hierarchy Process (AHP)* and *Technique for Order Preference by Similarity to Ideal Solution (TOPSIS)* methods attached to this group are mostly used for the determining of the alternative priorities. The *Complex Proportional Assessment (COPRAS)* and *Simple Additive Weighting (SAW)* multicriterial methods of evaluation are detailed in the publications: Parkan and Wu, 2000; Zhang and Yang, 2001; Ginevičius and Podvezko, 2001; Ginevičius et al., 2008. Their peculiarities may be revealed by the specifies in the formation of criterial system evaluation, the determination of their criterial significance and the evaluation of the research object on this basis.

The *Analytical Hierarchy Process (AHP)* method is backed up by applying of relative scale mathematically determined by the structure of pair comparison of matrixes and possibilities to generate real and approximated significances on the basis of proper vector (Saaty, 2001). From the point of this method application to the marketing researches, the three principal attitudes are important as follows: the attitudes of the identification and decomposition, the attitudes of comparative solutions and those of the priority synthesis. However, these attitudes are vulnerable in the practice, as a result, vulnerable from the point of their possibility to follow the integral priority system within all hierarchical structure. At the same time, the essence of the priority synthesis consists in the determination of the highest priority from local priorities and the last ones compared with it. The inconsistent realization of the procedures may become serious obstacle to correct application of the method itself under review.

The *Technique for Order Preference by Similarity to Ideal Solution (TOPSIS*) method is determined for the evaluation of alternative (or variant) priorities. The priority is given to the alternative which is nearest to ideal variant and at the same time most far to the worst variant under review. When choosing this method, there are any specifical requirements to the significances of evaluation criteria so as

their total is not necessarily equal to 1.

The *Simple Additive Weighting (SAW)* method is widely applied so as it permits to compound the principally different criteria and primary factors into the integrative measure. The multiple-choice application is determined by the moment that this method is suitable in case of all factors being independent in the system and when their interaction with integral dimension is not significant (as observed in the case study). This method has sufficiently flexible software programme (or *MS Excel* software package can be easily adapted). In the *SAW* method, the sum of significance of all criteria (factors) must be equal to 1 (or 100%). So this method is useful for the solution of the task under review.

The *Complex Proportional Assessment (COPRAS)* method permits to determine the value of the complex criterion for the object under review. Such a criterion is integrating some partial criteria (their values are determined, p. ex., by *SAW* method) and their significances are assesed by expert way (the favourability level of macroeconomic environment may be the complex criterion in such case).

Formation of the essential indicator groups

The accomplished review confirmed that it is usefull to formate the objective groups of essential macroindicators essentially influencing the magnitude valued by complex way. From the valuation system, they are as partial criteria determining the advantages of their different groups to the business development. These groups of indicators consist from statistically measured indices, supplemented by revealed additional indicators as: favour of taxation, favour of export inducement, level of governmental regulation, a/o selected by expert way. It is settled that in essence, this totality of partial criteria determines the evaluation of macroeconomic environment; but in partial or specific cases the special indicators (revealed by the SWOT and/or indicator identification procedures) are necessary to supplement the mentioned groups. Besides, those groups of indicators may be corrected periodically what is esp. actual in the recession period.

The sets of indicators selected preliminary and representing such basic groups having influence to the strategical marketing management solutions of Lithuania's production sectors (including chemical industries as a case study, cf. Purlys, Žvirblis, 2007) are presented in the Table 1. Below it is shown how macroeconomic environment becomes one of most important factors determining the export potential and enhancement of this sector companies.

Some of these indicators may be mentioned as defining the status of a country (i.e having influence on all companies), incl. GDP changes, levels of inflation and unemployment a/o. Some other indicators as direct foreign investments, export and import (esp. of competing items) a/o have a substantial influence to the companies' of some particular business sectors. Besides, the inflation and unemployment are interconnected by inverted relation so it is possible to include, as a rule, only one of them in the particular model. The influence of direct foreign investments esp. of their growth onto results of business activity also has to be all-round evaluated (Juchno, Tvaronavičienė, 2004). So the companies' who attracted the di-

Table 1

Selected basic groups of the essential indicators (not ranked)

Group (*E*) of economic indicators
GDP growth Inflation level Amount of direct foreign investments Level of economics regulation Favourability of taxation (redistributive function) System of finances (credits, interest rates) Number of bancrupting enterprises (changes) Development of free economic zones Promotion of leasing system Amounts of public procurement Other indicators (with account of business situation)
Group (*S*) of social indicators
Level of unemployment Real wages Shortage of qualified workers Emigration / immigration Flexibility of labour market Invasion of foreign labour force View on foreign companies' incursion Other indicators (with account of business character)
Group (*A*) of export – import indicators
Coverage of export Coverage of import Balance of state payments Amount of imported industrial production System of state promotion of export Currency exchange rates Insurance of export credits Other indicators (with account of business character)
Group *(L)* of legal indicators
Criteria of legal environment Regulation of flotation / liquidation Regulation of outsourcing procedures Criteria of operativeness of institutional decisions Other indicators (with account of business character).

rect foreign investments become more competitive in the markets. At the same time, many other Lithuanian companies' become uncompetitive and bankrupted. So as relative probability of bancruption is not analized below we do not included into revealed groups of the indices such of them as a number of inhabitants, payments between companies and specific criteria of bancrupcy, also the EU support to SME.

Scenarios for the objective indicator groups and the general scenario of macroeconomic environment

The methods of scenarios design or formation also are important to detail. They are mostly descriptive however many authors are stressing their perspectiveness esp. when applying for the forecasting of possible changes of business macro-environment. Between them, the applications of scenario method for the determination of the alternative strategies of a company as well as its marketing strategies in connection with disposable resources, in particular, have to be evaluated (Vasiliauskas, 2007). The scenario method may be applied resultatively in cases when the reliable information is insufficient and, as result, the decisions with account of uncertain situation may respond more correctly to the perspective changes. Besides, the scenario method is a mean for directed monitoring helping operatively correct the strategy under review (Vasiliauskas, 2007), in particular, permiting to analise the common influence of many various factors or heir combinations to the process under review. In the process

of scenarios' formation, their aims and tasks are revealed, the substantiated factors and participants of interaction are determined, primary and final scenarios generated (Ratcliffe, 2002; Walsh, 2005). When editing those scenarios, the experts have to systemize the disposable data, to formate the compositions of the factors and to edit the logically determined alternatives with account of their probabilities and differences (Ratcliffe, 2002; Walsh, 2005), in particular, also in the cases of marketing management decisions. Both several (sometimes alternative) scenarios and combinations of factors determining them have to be discussed in cases if there are any possibilities to foresee the changes of situation. The scenarios imitating objective situation are usually formulated subjectivelly but they help to reveal the general situation and competitive abilities of the company if the imitation is based on the factors selected individually and/or on their component compositions influencing the perspectives of business unit.

In the case for illustration, two scenarios were designed for each group of indicators (respectively "I" and "II") on the basis of composition used for the creation of the general macroeconomic environment scenarios. A perspective of was regarded and a principle was taken into consideration that one of the scenarios, if possible, must be oriented towards the real situation (from the point of view of impact into marketing strategy of a company). Table 2 presents the designed scenarios of separate objective indicator groups and general macroeconomic environment scenarios variants (respectively *M*I, MII and *M*III, they reflect the appropriate scenarios for every group of indicators); the scenarios are called as ''Recession", "Bright Time", "Perspective Situation".

Assessment of socioeconomic indicators (Lithuanian chemical industry)

The complex evaluation system presented below permits to form the entire totality of the socioeconomic indicator (including macroeconomic indices) groups as a partial criteria adequate to the peculiar situation with account to expertizing results. It is important that group of experts would be completed accordingly to their competence in the fields of marketing management and business finances. Under this methodology, the identification of substantial indicators was fulfilled for the Lithuanian chemical industry companies by means of expert evaluation. Table 3 represents indicators evaluated first of all by comparative intensity of distinguished factors' impact (p. ex., strongly favourable (+ +), favourable (+), unfavourable (-), strongly unfavourable (- -), etc.). These indicators were evaluated quantitively by experts according to 10 points evaluating system and lately identified with account of it. The necessary reliability of evaluation was achieved so as the value of the coeficients of concordance *W* amounted to 0,6 – 0,7 and necessary distribution λ^2 according to also was achieved (Kendall, 1979). The procedure of rejection of the best and worst evaluations in every stage was also applied. Anyway, the indicators incl. group of legal environment parameters were not included later so as the value of coefficient *W* was below 0,6.

Lately the group of identified indicators adequate to the situation was evaluated by *SAW* method and formated on the basis of I and II scenario variants. Corresponding to the suggested system, 5 points mark the medium favourable ma-

Table 2

Scenarios of separate objective indicator groups and general scenario of Lithuanian macroeconomic environment

Scenario title; component compositions	Content of scenario (according to each group of indicators and component compositions)
***M*I (Recession)** EI+SI+ AI+ LI	(EI) The development of state economy (influencing GDP) and level of inflation have negative impact; direct foreign investment conditions also have positive impact; tax system after foreseen alterations have strong negative impact; finance system (included credits and percentages) have negative influence; quantity of companies bankruptcies would grow; regulation of economics would remain negative influence. (SI) The influence of real wages level would be favourable; situation in labor market and emigrational / imigrational processes would stay as negative indicators; the shortage for cheap labor force would causing less problems. (AI) Coverages of export and import will remain as a negative indicators; export conditions may change to better or worse, protection standards and regulation of specific requirements from the point of view of a company would have negative impact. (LI) Legal regulation of flotation /liquidation would remain negative influence; laws (included EU) regulating export and import have negative attitudes (from the point of view of company); institutional decisions of state organs would be unfavourable for a company.
***M*II(Bright Time)** EII+SI+AI+ LII	(E1I) The development of state economic (influencing GDP) and level of inflation would have the positive impact in the future; direct foreign investment conditions would have also positive impact; tax system in future would not have such strong negative impact; finance system (included credits and percentages) would have positive influence; quantity of companies bankruptcies would decrease; regulation of economics would be more positive in the future. (S1) The influence of real wages level would be favourable; situation in labor market and emigration / imigration processes would stay as negative indicators; the shortage in cheap labor force would be causing less problems. (AI) Coverages of export and import would remain as negative indicators; export conditions may change to better or worse, protection standards and regulation of specific requirements (from the point of view of a company) would have negative impact. (LII) Legal regulation of flotation /liquidation would be more positive in future; laws (included EU) regulating export and import would have more positive than negative attitudes (from the point of view of company); institutional decisions of state organs would be more favourable for a company.
***M*III (Perspective Situation)** EII+SII+A1I+L1I	(EII) The development of state economic (influencing GDP) and level of inflation would have the positive impact in the future; direct foreign investment conditions would also have positive impact; tax system in future would not have such strong negative impact; finance system (included credits and percentages) would have positive influence; quantity of companies bankruptcies would decrease; regulation of economics would be more positive in the future. (SII) The influence of real wages level would be most favourable; situation in labor market and emigrational / imigrational processes would stay less negative indicators; the shortage in cheap labor force would cause more problems. (A1I) Coverages of export and import would be as more positive indicators; export conditions may change to better or worse, protection standards and regulation of specific requirements (from the point of view of a company) would have negative impact; export would be more promoted. (L1I) Legal regulation of flotation /liquidation would be more positive in future; laws (included EU) regulating export and import would have more positive than negative attitudes (from the point of view of company); institutional decisions of state organs would be more favourable for a company.

Source: composed by the authors.

croeconomic environment, 4 points - the unfavourable environment. The detalized models for evaluation of the objective indicator groups (according to identified adequately indicators and parameters of significance of their direct influence) may be expressed in the following form:

The group of economic indicators as a partial criteria for the evaluation of index *E(I):*

$$E(I) = \prod_{i=1}^{i=5} b_i E_i ; \prod_{i=1}^{i=5} b_i = 1, \qquad (6)$$

here b_i – the coefficients of direct significance for the level of influence of primary identified indicators; E_i (direct foreign investments, change of GDP etc.).

The group of social indicators as a partial criteria for the evaluation of index *S(I)*:

$$S(I) = \prod_{i=1}^{i=4} c_i S_i ; \prod_{i=1}^{i=4} c_i = 1, \qquad (7)$$

here c_i – the coefficients of direct significance for the level of influence of primary identified indicators S_i (real wages, level of unemployment etc).

The group of export-import indicators as a partial criteria for the evaluation of index *A(I)*:

$$A(I) = \prod_{i=1}^{i=4} f_i A_i ; \prod_{i=1}^{i=4} f_i = 1, \qquad (8)$$

Table 3

The results of qualitative and quantitative assessment of identified indicators according to scenarios "I" and "II" and determination of their weights of influence(case of Lithuanian chemical industry)

Socioeconomic indicator groups and determining essential indicators	Agreed marking	Qualitative evaluation	Assessment in points		Weights
			I	II	
***Group of economic indicators** (E)*					***0,4***
Direct foreign investments	E_1	(+)	5,5	6,0	0.2
Change of GDP	E_2	(-)	4,5	5,5	0,15
System of finances (credits and interest rates)	E_3	(-)	4,5	5,0	0.2
Economic regulation level	E_4	(-)	4,0	5,5	0.2
Taxation favourability	E_5	(--)	3,0	4,0	0,25
Level index *E (I)*			4,3	5,0	
***Group of social indicators (S)*:**					***0,35***
Real wages	S_1	(+)	6,0	6,0	0.3
Labour market flexibility	S_2	(–)	4,0	4,5	0.3
Unemployment level	S_3	(–)	4,5	5,5	0.2
Requirement for qualified workers	S_4	(–)	4,5	4,5	0.2
Level index *S (I)*			4,8	5,1	
Group of export- import indicators(A):					***0,25***
Export possibilities	A_1	(-)	4,0	4,5	0.35
Export inducement system	A_2	(-)	5,0	5,0	0.3
Changes in currency rates	A_3	(--)	3,5	4,5	0.15
Import changes	A_4	(--)	3,5	4,0	0,2
Level index *A(I)*			4,1	4,6	

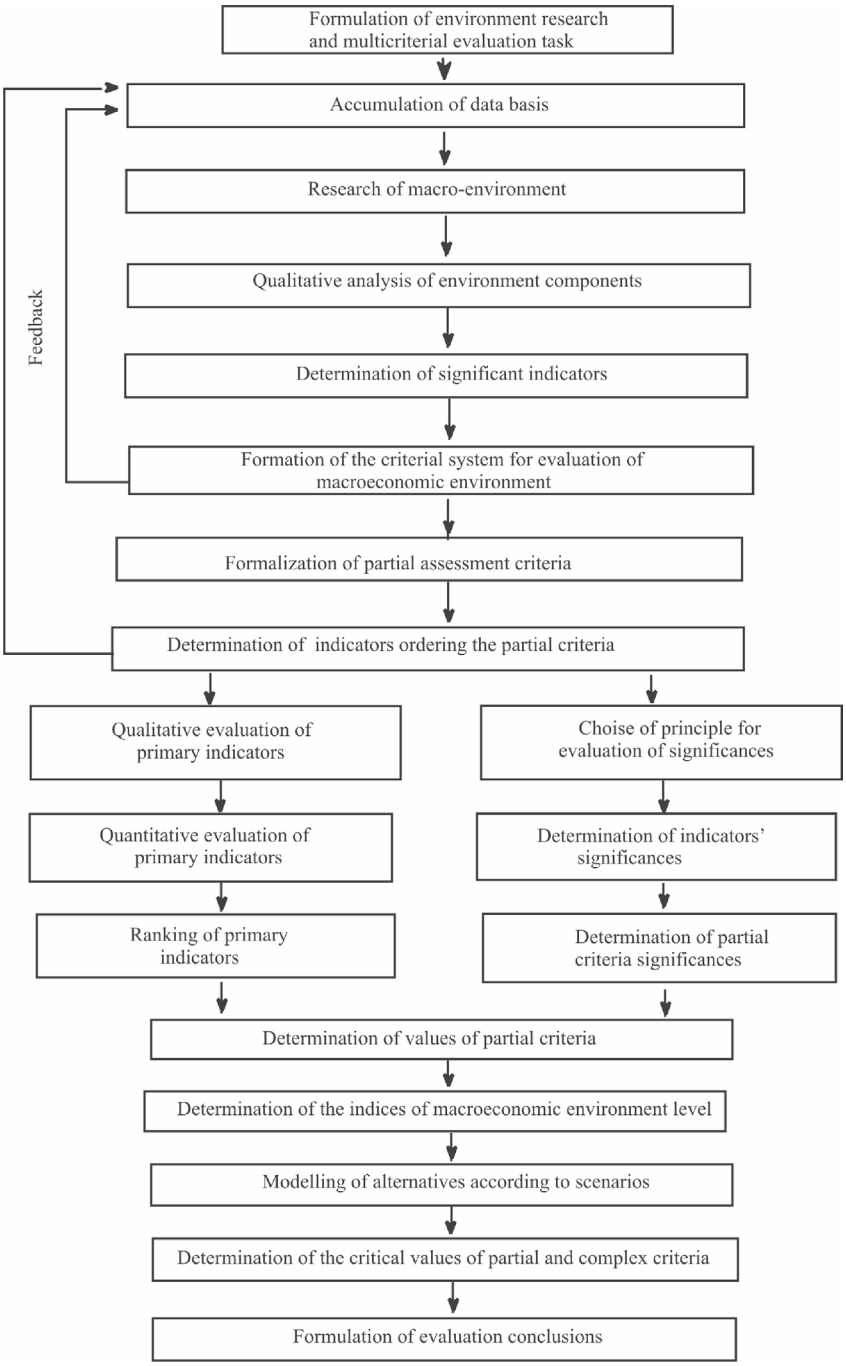

Fig.1. **Principal scheme of the algorithm for the evaluation of socioeconomic indicators**

Source: composed by the authors.

here f_i – the coefficients of direct significance for the level of influence of primary identified indicators A_i (export possibilities, export inducement system etc.).

The evaluation process, using *multicriteria evaluation* schematically is shown in Figure 1; the algorithm presented is realized, p. ex., by adapted *MS Excel* programm. The final results of the evaluation of identified indicator groups are presented in Table 3.

The standard procedure of concordance evaluation may be applied in the process:

$$W = \frac{12S}{r^2(m^3 - m)},$$

here *r* – a number of exsperts; *m* – number of parameters to be valued, *S* – sum of quadratic means of significance values deviations from expert ranks.

In its turn:

$$\lambda^2 = Wr(m-1) = \frac{12S}{rm(m+1)}.$$

The value of macroeconomic environment level index *M(I)* is determined by applying *Complex Proportional Assessment* (COPRAS) method and after finding the significances of partial criteria:

$$M(I) = k_e E(I) + k_s S(I) + k_a A(I), \quad (9)$$

here k_e, k_s, k_a – coefficients of impact of partial criteria *E(I), S(I), A(I)* on the value of macroeconomic environment index *M(I)*. It was determined by expert way: k_e = 0,4; k_s = 0,35; k_a = 0,25 and cf. Table 3).

The index of macroeconomic environment level was evaluated according to the three general scenario variants (*MI, MII* and *MIII*; legal group (LI and LII) were not included). Also the predetermined evaluation of both indicator groups and macroeconomic environment level indices were performed by 3 most significant indicators from every group of them (*MIV, MV* and *MVI* variants) and by both (economic and social) indicator groups (*MVII, MVIII* and *MIX* variants, coefficients of impact respectively 0,6 and 0,4). The results of calculations are as follow (Table 4).

Other scenarios also may be simulated in the process of multivariant calculations on the basis of the models (7) – (10) according to the algorithm presented in the fig.1 below; other scenarios may be also formulated according to the changing situation. The other comparative variants may be also analized, in particular those when uniform significance is attributed to all primary indicators or partial criteria. In such cases the expert evaluation procedure of the significances of those indicators or partial criteria is unnecessary. However, the significances of their influence are different in the common case so it is necessary to apply the methods presented

Table 4

Macroeconomic environment level index according to variants of general scenario

Compositions of indicator groups	Level index (in points)		
	Recession	Bright Time	Perspective Situation
*M*I	4,4		
*M*II		4,7	
MIII			5,0
*M*IV	4,6		
*M*V		4,8	
*M*VI			5,1
MVII	4,5		
MVIII		4,9	
MIX			5,0

before for their expert evaluations. The simplified solutions are possible when the comparative analysis of favourability of analogous socioeconomic indicators on marketing strategy (on exporting strategy) is accomplished (in particular, when comparing the Baltic States and other neighbour countries).

Conclusions

1. The research and evaluation of marketing macro-environment is one of the most important marketing decision stages and intend to gain the increasing significance, first of all when validating the strategic management decisions. The following qualitative methods as PEST, PESTEL, environment dynamics analysis and scenario analysis, must be mentioned in the review of the analysis methods.Whereas promising methods of quantitative evaluation are used rarely. Therefore, it is expedient to make conceptual analysis of perspectives of quantitative environment evaluation and to base the specific methods used for the computerised decision suport systems. It is necessary to design the measurement system i.e. principles of identification of the socioeconomic indicators (including macroeconomic indices) groups as well as basic models for complex (qualitative and quantitative) assessment.

2. As the analysis of the quantitative evaluation methods shows, it is expedient to apply the *multicriteria evaluation* methodology for the complex assessment of socioeconomic indicators. The *Simple Additive Weighting (SAW)* method is suitable for making the assessment of socioeconomic indicator groups, which involves the summing of the multiplication of values and significances of the criteria. The *Complex Proportional Assessment (COPRAS)* method is applicable in this case by determining of level index of macroeconomic environment (a 10-point system is suggested).

3. The proposed three-stage quantitative evaluation system was based on the set of basic indicators, the results of their identification as well as on the qualitative evaluation (the parameters of their significance determined by expert way), on the formation of their groups as an integral measures and multicriterial quantitative evaluation of macroeconomic environment level. The evaluation system integrates the scenarios of groups of identified indicators as well as the general scenario of macroeconomic environment. The system is also distinguished by its adaptivity and applicability in various conditions: so, it can be addapted to the companies of various productive sectors. It may be algorithmised and incorporated into the validation system of strategic marketing management decisions.

4. The basic correlative models for formed evaluation of the socioeconomic indicators influencing the strategic marketing management decisions of a company's (both selected groups of economic indicators, social indicators, export – import indicators, legal indicators and macroeconomic environment as a composition of indicator groups) are an important theoretical instrument used while validating in complex (according to created scenarios) the marketing macroenvironment as a composition of 4 - 6 components. The possible solutions are possible on this conceptual basis when the comparative analysis of influence of analogous state of socioeconomic indicators (incl. macroeconomic indices) and companies' marketing strategy are accomplished (in

particular, for Baltic States and the other neighbour countries).

5. The performed complex assessment of identified socioeconomic indicators for Lithuanian chemical industry companies showed that indicators of export – import group have comparativelly (and may have in the perspective) the most unfavourable influence (it scored respectively 4,1 and, within the context of the forecasted perspective situation, 4,6 point). The social indicator group is scored 4,8 and 5,1 point (the medium favourable level), and the economic indicator group scored as follows: in real situation – 4,3 point (unfavourable influence); the perspective situation – 5,0 point (medium favourability). It was determined after calculation of the level index of various indicator group combinations that the macroeconomic environment can be evaluated 4.4 – 4,6 point according to Recession scenario (unfavourable influence), and 4.7 – 4,9 point according to Bright Time scenario and 5,0 – 5,1 point according to Perspective situation scenario (medium favourability).

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The paper submitted: February 19, 2009
Prepared for publication: February 28, 2009

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SOCIOEKONOMINIŲ INDIKATORIŲ, TURINČIŲ ĮTAKĄ ĮMONIŲ MARKETINGO SPRENDIMAMS, DAUGIAKRITERINIS VERTINIMAS

S a n t r a u k a

Straipsnyje apibūdinami šalies socioekonominių indikatorių (tarp jų - makroekonominių rodiklių), turinčių įtaką įmonių marketingo strateginiams sprendimams, integruoto vertinimo principai, pagrįsti kiekybinio vertinimo metodai, pateikti baziniai vertinimo modeliai ir atlikto (Lietuvos chemijos pramonės įmonių pavyzdžiu) makroekonominės aplinkos tyrimo bei jos vertinimo rezultatai.

Marketingo makroaplinkos tyrimai ir vertinimas yra svarbi įmonės marketingo tarnybos funkcija .Nors, atliekant PEST analizę, aplinkos pokyčių dinamikos analizę, daugiausia taikomi kokybinio vertinimo metodai pasitelkiant ekspertus, vis tik perspektyvą turi kiekybinis vertinimas. Ryšium su tuo marketingo makroekonominės aplinkos kiekybinio vertinimo principų bei metodų parengimas yra aktualus tiek teoriniu, tiek praktiniu požiūriu.

Darbo tikslas – sukurti socioekonominių in-

dikatorių, darančių įtaką įmonių strateginiams marketingo sprendimams, kompleksinio vertinimo principus, bazinius modelius ir atlikti šių indikatorių, reikšmingų Lietuvos chemijos pramonei, kompleksinį vertinimą.

Straipsnyje pateikiama sukurta vertinimo sistema, kuri grindžiama socioekonominių indikatorių grupių formalizacija, kokybine analize ir trijų pakopų kiekybinio vertinimo principu. Ji apima pirminių socioekonominių indikatorių nustatymą (pagal ekspertinį, tarp jų kiekybinį, įvertinimą). Pagal pateiktus bazinius vertinimo modelius nustatomi šių indikatorių grupių indeksai, kaip integriniai dydžiai, išreikšti balais (darbe sąlyginai išskirtos ekonominių indikatorių, socialinių indikatorių, eksporto bei importo indikatorių ir teisinių indikatorių grupės). Pagal šiuos dydžius, atsižvelgiant į reikšmingų (identifikuotų tam tikram šalies ūkio sektoriui) indikatorių grupių scenarijus bei į bendrąjį makroekonominės aplinkos scenarijų, nustatomas makroekonominės aplinkos palankumo lygis. Pasirinktas integruotas jo vertinimo matas – lygio indeksas, kuris irgi išreiškiamas balais (10 balų sistemoje).

Išnagrinėjus daugiakriterinės analizės metodus, pagrįstas kiekybinio vertinimo grupės metodų, geriausiai atitinkančių iškeltą uždavinį, taikymas. Atliekant socioekonominių indikatorių grupių integruotą kiekybinį vertinimą, tikslinga taikyti kriterijų reikšmių ir jų reikšmingumų sandaugų sumavimo metodą (SAW). Vertinant makroekonominės aplinkos lygį taikytinas kompleksinis proporcinis daugiakriterinio vertinimo metodas (COPRAS).

Lietuvos chemijos pramonės gaminių sektoriaus įmonių makroekonominės aplinkos tyrimo išdavoje nustatyti ir ekspertiniu būdu įvertinti reikšmingi indikatoriai. Taip pat atliktas šių identifikuotų indikatorių kiekybinis vertinimas ir tolesnis integruotas jų grupių vertinimas. Nustatyti socioekonominių indikatorių grupių lygio indeksai, taip pat makroekonominės aplinkos, kaip jų visumos, lygio indeksas, kuris atspindi, aukštesnis ar žemesnis, nei vidutinis, yra makroekonominės aplinkos palankumo lygis. Toliau atliekant daugiavariantinius skaičiavimus (pirmiausia pagal suformuotus indikatorių grupių scenarijus, taip pat ir pagal bendrąjį makroekonominės aplinkos scenarijų) nustatyta, kad nepalankiausiai vertintina eksporto – importo indikatorių grupė (pagal I scenarijų – 4,1 balo, o pagal perspektyvinį (II) scenarijų - 4,6 balo). Pagal recesijos scenarijų makroekonominės aplinkos lygio indeksas yra 4,4 balo, o pagal pragiedrulių scenarijų – 4,7 balo, tai yra žemiau vidutinio palankumo lygio. Pagal perspektyvinės situacijos scenarijų šis indeksas yra lygus 5,0 balo, o tai atitinka vidutinį palankumą. Toks vertinimas yra svarbus pagrindžiant strateginius marketingo sprendimus, išplečiant įmonių strateginę erdvę. Algoritmizavus šį procesą, jis gali būti įtrauktas į perspektyvines kompiuterizuotas verslo valdymo sistemas.