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LEGAL FORM DETERMINATION FOR THE DEVELOPMENT OF CLUSTERS' ACTIVITIES*

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Abstract. In this study, the authors have investigated the determination of the most suitable legal form for the development of the cluster management activities. In each particular case the developers of the cluster have to assess the objectives of the cluster, the principal aspects of the mutual partnership, the risks that could be provoked, and in accordance with the derived decisions. The choice of the cluster legal activity form depends on the objectives and on the branch in which the cluster is operating, on the number of the cluster participants, on the type of the activities of the cluster, on the openness or closeness to new members, type of the contributions of the partners and the other factors. The most reliable solution regarding the choice of the model of the functioning and management of the cluster has to be derived as well legal regulation of the legal form of the activity discussed. The advantages and disadvantages of two models of the cluster formation discussed. During experimental evaluation, the significance of criteria was determined and the expert evaluation on legal form for the

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development of clusters activities was performed. Foundation and management of the clusters are determined firstly by the fact that in one case a new established legal person performs the functions of the cluster coordinator while in another case one of the cluster participants performs the functions and partners legal cooperation determined by Agreement on Partnership. Article analyses the multi-criteria decisions-making to establish the cluster with the certain type of juridical form of legal person or to develop cluster management activities by the Partnership Agreement. The recommendations presented by application of MCDM calculus methods with aspect of percentage.

Keywords: MCDM, clusters, juridical form, TOPSIS, COPRAS, SAW

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1. Introduction

The aim of the study is to identify the potential and possibilities to choose thoroughly the legal form of the cluster for it to be prosperous in its operational activities and management. The organizational structure of the selected legal form has to satisfy the majority of the requirements of the cluster functioning. However, the mutual requirements have to be considered essential enabling the cluster itself to operate efficiently and transparently. To achieve this is possible, in case the hierarchy level in the cluster is insignificant and the form of the selected activities makes it possible to efficiently provide necessary decisions, accurately and suddenly react to the demand and needs of the customers on the market. Innovation clusters means structures or organised groups of independent parties (such as innovative start-ups, small, medium and large enterprises, as well as research and knowledge dissemination organisations, non-for-profit organisations and other related economic actors) designed to stimulate innovative activity through promotion, sharing of facilities and exchange of knowledge and expertise and by contributing effectively to knowledge transfer, networking, information dissemination and collaboration among the undertakings and other organisations in the cluster (European Commision, 2014).

The clusters are assessed according to their potential regarding the innovations to be developed. They could be considered innovative, if their enterprises apply a high level of the mutual cooperation among the enterprises, what concerns the level of the clients and the suppliers; they provide an intensive partnership and cooperation with the universities, development institutions and the other organizations of education and scientific research. Such particular forms of the cooperation promote the development and expansion of the new innovations.

Regions are the geographical areas in which the local spill-overs that drive cluster evolution have a meaningful influence on economic performance, depending on the specific sector, activity, and externality the scope of the appropriate area, it also refers to the area in which there is a significant likelihood for knowledge to be spread through unplanned meetings or chance observations of what others do (Ketels & Protsiv, 2016). The appropriate selection of the legal form in majority cases depends on the type of the region in which the cluster tends to operate, on the number of the participants of the cluster, on the objectives of the cluster activities as well as on the other factors. It is very important to speed up the mobilization of the recourses of all the participants of the cluster, to be able to accept and approve the new members possessing very diverse competencies.
Regularly the optimum number of the participants of the cluster greatly depends on the field of the activities or the branch of the industry or innovations.

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To determine the optimum number of the participants of the cluster in a particular field of the operation is rather difficult due to the very specific and individual type of the cluster. The optimum number of the participants of the cluster has to be related to the chain that provides the reliable and serviced product, innovation and the development of the chain together with an easy and not complicated way of the partnership communication. The significance of the cluster is the fact that all the members of the cluster are focused on to the activities of the management in the fields requiring the competence as well as the professional experts are delegated. A single participant, especially if it is a small enterprise, is not able to provide a wide number of diverse competencies, when in all the stages of the formation of the values, the priorities against their competitors or in terms of the independent acquisition of such competencies might and would require disproportionally high costs. Therefore, the participation in the cluster with a relatively small amount of the contribution, make it possible to obtain the maximum economic benefit for each participants of the cluster, the partnership competence is transformed into the type of cooperation. In cases of separate enterprises, it is too expensive to invest into the purchase of the expensive scientific equipment directed towards the further scientific investigations or the infrastructure, but the group of the enterprises registered in the cluster could make use of them. However, the participation in the cluster make it possible for the enterprises to share the costs and the risks, when mutually developing and putting to testing the prototypes of the new products. Cluster evolution is viewed as an adaptive process with different possible outcomes based on episodic interactions of nested systems (Martin & Sunley, 2011). The participation of the cluster tends to develop the cooperation in all the chains of the development of the values (Yang, Černevičiūtė, 2017; Žižka et al. 2018; Razminienė, Tvaronavičie 2018).

The cluster is the dynamically developing virtual business system that has been developed to implement their particular objective. The geographic concentration of activities, the intersectoral and intrasectoral linkages and the assembling of local innovation networks, based upon strong cooperation ties between public and private actors (Monteiro, De Noronha, & Neto, 2013). The planning of the main activities has to be executed when officially formalizing them, development and management of the clusters depends on advantages and disadvantages of models of the cluster formation. However, that type of the hierarchy distribution preserving one level with the majority of the members is considered complicated as well. The most important issue is to describe and agree on the main principals of the management of the cluster, because the clusters themselves depend on the particular individuals employed and their responsibilities provided.

2. Set of Criteria for Evaluation of a Legal Form of Activity

Thus, in particularly, there have to be discussed Model A and Model B of the establishment of cluster, analysing the issues of their founding, managing and operation, the advantages, disadvantages of their operational forms. It is possible to single out two particular models in terms of their operation and management, which in their terms determine the choice of the legal form and the way of their official registration. In the case of Model A in order to coordinate the management of the cluster there is established a new and separate legal person, which is entrusted with the objectives of the functions of the cluster manager. In the case of Model B the functions of the cluster manager are entrusted to one of the participants of the cluster, but a new and separate legal entity is not liable to the responsibility concerning the execution of these functions.

In Lithuania, the Model A prevails; therefore, the participants of the cluster initiate a separate legal entity, which is responsible for carrying out the functions of the cluster manager. The following three forms of the legal persons are applied in the practices of the Republic of Lithuania: Private Limited Liability Company (PLLC), Public Establishment (PE), Association, these legal persons are liable to the responsibility of the newly appointed cluster manager for the functions of the cluster coordinator. According the data from the National Register of Legal Entities of the Republic of Lithuania there are registered 35 clusters as the legal persons in the Republic of Lithuania. As the Associations registered twenty-four clusters, five registered as PE and four legal persons as

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PLLC, one cluster registered as Individual Enterprise and one as Small Partnership (Center of Registers, 2019). The first and the most popular way of establishment legal person is Association and it is a separate legal entity, but the objective of the Association is to coordinate the activities of the participants of the Association, to represent the interests of the participants of the Association as well as to protect them (Republic of Lithuania Law on Associations, 2004). The Association consists of the participants which have to be not more than three and they have their own separate managing authorities, or they have the right to hire employees or make agreements. The property of the Association is separated from the property of the participants and the participants are not liable for the obligations of the Association limited civil liability. The issues related to the activities management of the Association problems are delegated and addressed at the Meeting of the Participants, where each member to the Association has one vote unless the regulations of the Association prescribe the other way. The advantages of the Association are considered to be the following: a simple procedure of the acceptance of the new members of the participants and the possibility to have a multi-stage structure of the management. The greatest disadvantage of the Association is the fact that the earned profit of the Association is not allowed to be distributed to its participants, there is no possibility to pay dividends from the part of the profit.

The objective of the Public Establishment is to satisfy the public interests in carrying out the activities in the fields of education, scientific research, cultural events, health care, environmental protection, development of sports activities, social and legal consultancy and the other social activities (Republic of Lithuania Law on Public Establishments, 2017). The number of the founders of the Public Establishment is not limited; they could be considered the entities, not seeking any profit from the operational activities of the companies. The entities becoming stakeholders of the Public Establishment are liable to delegate their contribution to the company; the quantity of it has to be determined by the stakeholders themselves. The law do not prescribe the minimum amount of the contribution. Thus, a single stakeholder in the General Meeting of the Stakeholders has only one vote, if the Articles of the Association do not prescribe the other way. The Public Establishment is obliged to have the Manager and the General Meeting of the Stakeholders; what concerns the other authorities of the company the Board, the participants of the Public Establishment are allowed to make decisions by themselves and decide what managing authorities to be elected. The property of the Public Establishment is separated from the property of participants, limited civil liability and they are not responsible for the obligations of the Public Establishment and the debts.

The advantage of the Public Establishment is the following. The procedure of the acceptance of the participants is not complicated and the equality of the General Meeting of the Participants of the Stakeholders. The greatest disadvantage of the Public Establishment that the law imperatively prescribing the restrictions for the purposes of the activities carried out by the legal person for to satisfy the public interests in carrying out the activities in the specific fields. The functions and activities of the cluster manager are related not to the public interests but to the interests of the participants of the cluster. That could prevent the efficiently exercising the functions the cluster manager within the Public Establishment. In the practices of Lithuania, the cluster managers are also used to be the Public Establishment.

The third form of legal person Private Limited Liability Company (Republic of Lithuania Law on Companies, 2014). PLLC is an independent legal entity, separated from the company owners (shareholders), the authorised capital is divided into the shares. After the establishment of the Private Limited Liability Company, the independent company is able to purchase property in their name the property is separated from the property of the owners, limited civil liability. It is worth mentioning that the cluster manager is able to be entrusted not only with the legal entity but the natural person as well, a person carrying out an individual enterprise and supplying the services despite that, the majority of the cluster managers are considered to be legal entities. An example one cluster is registered as the Individual Enterprise according the data of National Register of Legal Entities.

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The founders of the Private Limited Liability Company have the right to own the shares of the company, but do not have the right to hold the particular property of the company, as well. In case, the company is profitable the shareholders have the right to obtain the part of the profit (dividends). Besides that, the shareholders such as the owners of the company altogether determine the objectives of the management and decide on the main issues. As the property of the shareholders is separated from the company property - limited civil liability, the shareholders are not in charge of the commitments of the company, and the debts.

It is possible to distinguish the following principal advantages of the PLLC. As the possibility to influence the management of the Private Limited Liability Company proportionally to the number of the shares owned by the shareholders and the profit of the PLLC is possible to be paid to the shareholders as the dividends. The law clearly regulates and indicates the legal relationship between the shareholders. The disadvantages of the PLLC could be considered more complicated and more formal than the other legal forms regarding the joining and withdrawing of the new members in the company.

According to the Model B the activity forms of the cluster when the cluster manager is appointed to be a participant of the cluster. The scope and legal regulation for the Agreement on Partnership settled by the Civil Code of the Republic of Lithuania (Civil Code of the Republic of Lithuania, 2000). The cluster functioning and management, distinguish that the functions of the cluster manager are delegated to one of the participant of the cluster not to a new legal entity. In majority cases, a certain participant of the cluster, is delegated the performance of the functions of the cluster manager just by signing joint activity the Agreement on Partnership with the other members.

The partnership activity is prescribed what concerns the cooperation of the partners in terms of their resources and knowledge, what concerns the general interests and the objective. The agreement determines and describes the pre-condition for the participants of the cluster to be free to agree on various aspects of cooperation and cluster activities. It prescribes the order the way the contributions to be made, the issues related to the ownership of the contributions, the distribution of the functions and liabilities, representation of the particular cluster, division of the profit from the performed activities. One of the issues that could be discussed in the Agreement on Partnership is the case, when one of the participants is delegated the functions of the performance of the cluster manager. Then the right is delegated to a particular participant to be able to represent the participants and besides that there are determined the limits of the authorities as well as the accountabilities, the order the way the information could be provided to the other partners.

3. The applied MCDM methods

The MCDM methods are used for the calculation to choose a legal form of activities for the cluster establishment. The application of the MCDM methods consist of 2 stages. The first stage it is the determination of the criteria weights and the second – the legal form establishment for the cluster activities evaluation according to the criteria. For obtaining the relative estimates of the courses and demonstrating the application of MCDM methods, such as TOPSIS (The Technique for Order of Preference by Similarity to Ideal Solution), SAW, COPRAS (Complex Proportional Assessment), which reflect the main ideas of MCDM approaches, were used in the work. They include the calculation of the optimal distance from the best and from the worst alternatives, the combination of the values and weights of the criteria for obtaining the qualitative estimate of the method, determination of the degree of influence of the maximizing and minimizing criteria and taking into consideration the optimal distance from the average estimate (Vinogradova, Podvezko, & Zavadskas, 2018).

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3.1 The method used for determining the weights of the criteria

The weights of criteria mean one of two component parts in MCDM methods. The effect of criteria on the results of evaluation differ, therefore determination of weights is very important (Trinkūnienė, et al., 2017). The analytical hierarchy process method is a closed logical construction that is realized by applying simple rules for organizing and analyzing complex decisions, in order to find the best possible solution (Vinogradova & Kliukas, 2015). The principle of the pairwise comparison method is that an expert simultaneously compares only two criteria out of the total number of criteria. Pairwise comparison determines how much one criterion is more important than the other one. Saaty (Saaty, 1980) proposed a five score 1-3-5-7-9 evaluation system (Turskis, Keršulienė, & Vinogradova, 2017). If criteria have the same importance, the result of evaluation is equal to one. If the difference between the weights of criteria is the biggest, the result of evaluation is equal to nine. Once evaluation is completed, an inverse unknown weight ratio symmetric pairwise comparison matrix *P* is formed. Reciprocals are automatically assigned in each pair-wise comparison (Kurilov & Vinogradova, 2016)

Matrix elements $p_{ij} = \frac{w_i}{w_j}$, $(i, j = 1.2,\dots, m), p_{ij} = \frac{1}{p_{ji}}, p_{ii} = 1$, m – the number of criteria.

Each expert evaluates $m(m-1)/2$ pairs, here m – the number of criteria (Kurilovas, Vinogradova, & Kubilinskiene, 2016). It is easy to check that

$$P\bar{\omega} = m\bar{\omega} \quad (1)$$

here, $\bar{\omega}$ – unknown weight eigenvector, which means that the problem of eigenvalues and eigenvectors (1) with the eigenvalue λ equal to matrix series m is being solved.

It was proved by Saaty (1980) that the weight vector $\bar{\omega}$ is the eigenvector of normalized values of the P matrix consisting with its maximal eigenvalue λ_{max}. The consistency (non-contradiction) of the expert's evaluation is determined by Consistency Index CI and Consistency Ratio CR:

$$CI = \frac{\lambda_{max} - m}{m - 1}, \quad (2)$$

$$CR = \frac{CI}{RI}, \quad (3)$$

here, RI is the random value of the Consistency Index (Saaty, 1980). The evaluation of the pairwise comparison is admitted if $CR < 0.1$.

3.2. The SAW method

The basic idea behind the MCDM methods is to combine the criteria values and weights to obtain a single point of reference for evaluation, i.e. the method's criterion. A common example is SAW (Simple Additive Weighting), where the method's evaluation criterion S_i is calculated by Eq.(4) (Hwang & Yoon, K. , 1981) (Podvezko, 2011):

$$S_i = \sum_{j=1}^{m} w_j \tilde{r}_{ij} \quad (4)$$

where w_j is the weight of the j_{th} criterion and $\tilde{r}_{ij}$ is the normalized (dimensionless) value of the j_{th} criterion for the i_{th} alternative:

$$\tilde{r}_{ij} = \frac{r_{ij}}{\sum_{i=1}^{n} r_{ij}} \quad (5)$$

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3.3. The TOPSIS method

The method *TOPSIS* is based on vector normalization (Hwang & Yoon, K. , 1981) (Podviezko, 2014)

$$\tilde{r}_{ij} = \frac{r_{ij}}{\sqrt{\sum_{i=1}^{n} r_{ij}^2}} \quad (i = 1, \ldots, n;\ j = 1, \ldots, m) \tag{6}$$

where $\tilde{r}_{ij}$ is the normalized value of *j*-th criterion for *i*-th alternative.

The best alternative V^* and the worst alternative V^- were calculated by

$$V^* = \{V_1^*, V_2^*, ..., V_m^*\} = \{(\max_i \omega_j \tilde{r}_{ij} \ / \ j \in J_1), (\min_i \omega_j \tilde{r}_{ij} \ / \ j \in J_2)\},\ V^- = \{V_1^-, V_2^-, ..., V_m^-\} = \{((\min_i \omega_j \tilde{r}_{ij} \ / \ j \in J_1), ((\max_i \omega$$

where J_1 is a set of indices of the maximized criteria, J_2 is a set of indices of the minimized criteria.

The distance D_i^* of every considered alternative to the ideal (best) solutions and its distance D_i^- to the worst solutions were calculated:

$$D_i^* = \sqrt{\sum_{j=1}^{m} (\omega_j \tilde{r}_{ij} - V_j^*)^2}, \quad D_i^- = \sqrt{\sum_{j=1}^{m} (\omega_j \tilde{r}_{ij} - V_j^-)^2}. \tag{8}$$

The criterion C_i^* of the method *TOPSIS* was calculated by

$$C_i^* = \frac{D_i^-}{D_i^* + D_i^-} \quad (i = 1, ..., n) \quad (0 \le C_i^* \le 1). \tag{9}$$

The largest value of the criterion C_i^* corresponds to the best alternative.

3.4. The COPRAS method

The criterion of the COPRAS (Complex Proportional Assessment) method) (Zavadskas, 2007) Z_i was calculated as follows:

$$Z_i = S_{+i} + \frac{\sum_{i=1}^{n} S_{-i}}{S_{-i} \sum_{i=1}^{n} \frac{1}{S_{-i}}}, \tag{10}$$

$S_{+i} = \sum_{j=1}^{m} \omega_j \tilde{r}_{+ij}$ is the sum of the weighted values of the maximized criteria $\tilde{r}_{+ij}$,

$S_{-i} = \sum_{j=1}^{m} \omega_j \tilde{r}_{-ij}$ is same for the minimized criteria,

where ω_j is the weight of the *j*-th criterion and $\tilde{r}_{ij}$ is the normalized value of the *j*-th criterion for the i-th alternative is calculated by Eq. (5).

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4. Data Description and Evaluation of the Criteria Values for the Determination of Legal Form for Cluster Activity

Each member has completed an evaluation form. They filled in the AHP matrix of pairwise comparisons of the four group of criteria and carry out a direct evaluation of Model A and Model B forms on five-point scale according to criteria. The scale 1-3-5-7-9 of the Saaty's approach AHP was used for comparison. The consistency of the matrix was examined by determining the index and the ratio of the consistency. The values of the AHP matrix filled in by one of the member (Table 1).

Table 1. The AHP matrix filled in by one of the member. Source: Created by the authors.

	criterion 1	**criterion 2**	**criterion 3**	**criterion 4**	**criterion 5**	**criterion 6**	**criterion 7**
criterion 1	1,00	2,00	5,00	6,00	3,00	4,00	7,00
criterion 2	0,50	1,00	4,00	5,00	2,00	3,00	6,00
criterion 3	0,20	0,25	1,00	2,00	0,33	0,50	3,00
criterion 4	0,17	0,20	0,50	1,00	0,25	0,33	2,00
criterion 5	0,33	0,50	3,00	4,00	1,00	2,00	4,00
criterion 6	0,25	0,33	2,00	3,00	0,50	1,00	4,00
criterion 7	0,14	0,17	0,33	0,50	0,25	0,25	1,00

The values of the weights of the criteria assigned by the member were obtained by using AHP method (1)-(3) are given in Table 2.

Table 2. The values of the weights of the criteria assigned by one member. Source: Created by the authors.

ω_1	ω_2	ω_3	ω_4	ω_5	ω_6	ω_7
0,3547	0,2405	0,0681	0,0451	0,1549	0,1043	0,0324

Seven members filled recommended evaluation form to determine the legal form for the development of the clusters activities, the effect of criteria on the results of evaluation differ. The average values of the weights of the criteria are given in Table 3 according the evaluation of legal activities establishment by Model A and Model B.
The Model A Group 1 sets the following advantages criteria: 1) all members are involved into the activities of cluster as the shareholders or members; 2) easy control of the cluster activities; 3) clear structure of legal person management defined by the law; 4) easy to perform contracts as legal person activity is performed independently; 5) the legal person owns property by the ownership right and easy to manage acquired intellectual property; 6) the member of the cluster are not obliged to perform the clusters manager administrative issues. The following disadvantages determined by the Group 2: 1) members of the cluster responsible for the accountability of legal person; 2) additional costs for establishment, management of new legal person; 3) formal establishment of the legal person; 4) accurate legal regulation of the members' relationship; 5) property and non-property contributions restrictions; 6) formal join and withdraw of the member of cluster; 7) legal person liquidation procedure after the finish of the activities.

The Model B Group 1 sets advantages criteria: 1) more flexibility to arrange the additional agreements; 2) possibility to assign management of the cluster to several members; 3) more flexibility in the management of the cluster; 4) costs saving for administration and establishment of legal person; 5) flexibility to join and withdraw the cluster; 6) flexibility to determine value by co-operating property and non-property contributions. Following

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disadvantages settled by Group 2: 1) the assets of the cluster belongs to all members; 2) the management of cluster assets based on partners agreement; 3) each partner liable under joint contractual obligations to the extent of all his property; 4) the production received during joint activities, income and results owned by all partners joint-partial.

Table 3. The weights averages of the criteria of Model A and Model B. Source: Created by the authors.

A	Group 1	**criteria 1**	**criteria 2**	**criteria 3**	**criteria 4**	**criteria 5**	**criteria 6**	
		0,1649	0,1200	0,1655	0,2498	0,0951	0,2046	
	Group 2	**criteria 1**	**criteria 2**	**criteria 3**	**criteria 4**	**criteria 5**	**criteria 6**	**criteria 7**
		0,2752	0,1534	0,1312	0,1257	0,1495	0,0739	0,0910
B	Group 1	**criteria 1**	**criteria 2**	**criteria 3**	**criteria 4**	**criteria 5**	**criteria 6**	
		0,1512	0,1445	0,2481	0,1540	0,1108	0,1914	
	Group 2	**criteria 1**	**criteria 2**	**criteria 3**	**criteria 4**			
		0,1714	0,2238	0,1849	0,4199			

Source: Created by the authors

The analysis of the results indicated the most value criteria for both models. In the Model A the most important criteria were indicated as easy performance of contracts and independence of legal person, non-obligations of clusters members to perform the administration and responsibility of the accountability of legal person. In the Model B the most value was given to the criteria of flexibility to manage the cluster, to management of assets and the production received during joint activities, income and results ownership.

Recalculation of criteria weights of two groups of each legal form was made by simple data transformation:

$$\widetilde{\omega}_i = \frac{1}{g} \cdot \omega_{group}, \ \sum_{i=1}^{m} \widetilde{\omega}_i = 1, \qquad (11)$$

where $\widetilde{\omega}_i$ – summarize weights. ω_{group} – are criteria weights of a separate group of criteria, g – number of group of the criteria.

The recommendations about determination of the legal form of cluster activities should be provided for each member. Meanwhile MCDM methods regularly applied for the evaluation of several alternatives in the following case available alternatives were introduced for the multi-criteria decisions making.

The TOPSIS method (8)-(9) was used to solve the following task at the article for the characteristics to give the results at the scale from 0 to 1. Application of the following method for the calculation was applied by three alternative values: the worst alternative, the member real evaluation and the best alternative. The worst alternative values criterion 1 for the maximised criteria and for minimised criteria – 5. Accordingly, the best (ideal) alternative values for the maximised criteria applied criterion 5 and minimised criteria – 1. TOPSIS method for the following case always the worst alternative evaluate by value 0 and ideal – 1. Actual member real evaluation will be displayed at the interval from 0 to 1, that provides the comparison or legal forms available in percentage aspect.

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The values of the Model A evaluated by one of the member presented in Table 4. Summarized weights calculated by application of Equalation 11.

Table 4. The values of the Model A by one of the member (TOPSIS method).

Criteria	sum. w	w	Criterion direction	w	worst	real	ideal
1 criterion	0,0491	0,0981	max	0,0981	1	5	5
2 criterion	0,0303	0,0606	max	0,0606	1	4	5
3 criterion	0,1214	0,2429	max	0,2429	1	3	5
4 criterion	0,2034	0,4067	max	0,4067	1	3	5
5 criterion	0,0748	0,1496	max	0,1496	1	5	5
6 criterion	0,0211	0,0421	max	0,0421	1	4	5
1 criterion	0,0518	0,1036	min	0,1036	5	4	1
2 criterion	0,0224	0,0448	min	0,0448	5	5	1
3 criterion	0,1200	0,2399	min	0,2399	5	2	1
4 criterion	0,1771	0,3543	min	0,3543	5	3	1
5 criterion	0,0793	0,1587	min	0,1587	5	3	1
6 criterion	0,0156	0,0312	min	0,0312	5	2	1
7 criterion	0,0338	0,0676	min	0,0676	5	4	1

Source: Created by the authors.

The calculation applied with the use of analogue method for the recommendations to determine the legal form for each member. The result of TOPSIS method (0, real value, 1) based on the evaluation of three alternatives (worst, real, ideal). The recommendation for each member provided in Table 5. The difference determined between two legal forms, the major difference indicate obvious recommendation for the choice of legal form.

Table 5. Recommendations for each member (TOPSIS method)..

	TOPSIS			
Member	A	B	Recommendation	Difference
1	0,55	0,75	B	0,2
2	0,59	0,43	A	0,16
3	0,49	0,42	A	0,07
4	0,57	0,41	A	0,16
5	0,52	0,39	A	0,13
6	0,44	0,40	A	0,04
7	0,45	0,57	B	0,12
Average	**0,52**	**0,48**		

Source: Created by the authors

The legal form determination for the cluster activity management presented in circular diagram by percentage.

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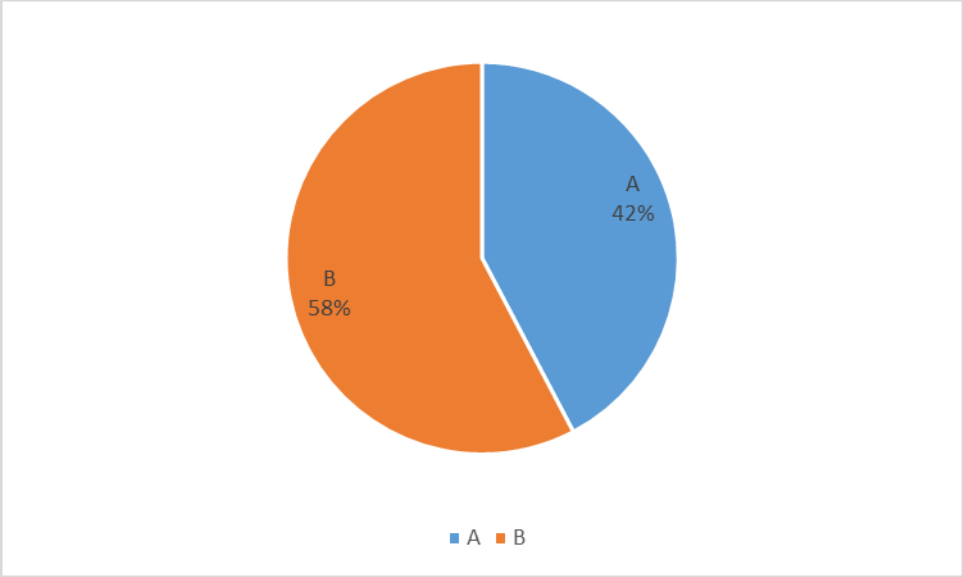

Figure 1. Model A and Model B recommendation by percentage aspect.
Source: created by the authors.

However, during evaluation according the result presented in Table 5 for the first and for the seventh member the Model B of legal form prevail other members recommendation to apply Model A. The Model A prevails in general case for all member of clusters. Following the recommendations, the members merged to the groups A and B (Table 6).

Table 6. Merged result for group A and B.

Member	**A**	Member	**B**
2	0,59	7	0,57
3	0,49	1	0,75
4	0,57		
5	0,52		
6	0,44		
Average	**0,52**	Average	**0,66**

Source: Created by the authors

Applied comparator for all members A Model recommendations with the merged result of group A percentage remain the same 52 %. However, B group merged result increased from 48 % to 66 %.

The SAW (4)-(5) and the COPRAS (10) methods applied to solve the following task. These methods without the possibility to apply for the result the calculation interval [0;1] as the TOPSIS method. The calculation done with additional alternative (Table 7). Summarized weights calculated by application of Equalation 11.

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Table 7. The values of the Model B one of the member (SAW/COPRAS methods)..

Criteria	Sum. w	w	Criterion direction	real	ideal
1 criterion	0,0214	0,0428	max	5	5
2 criterion	0,0320	0,0641	max	4	5
3 criterion	0,1912	0,3825	max	3	5
4 criterion	0,1252	0,2504	max	4	5
5 criterion	0,0798	0,1596	max	5	5
6 criterion	0,0503	0,1006	max	3	5
1 criterion	0,0477	0,0954	min	4	1
2 criterion	0,0800	0,1601	min	5	1
3 criterion	0,1386	0,2772	min	5	1
4 criterion	0,2336	0,4673	min	2	1

Source: Created by the authors

During the investigation, a comparative analysis for the result of Model A and Model B calculated by percentage from ideal alternative result according following transformation:

$$Recommendation = \frac{100\% \cdot real}{ideal}$$

Table 8. The values of the Model A by one of the member.

Member number	A	B	Recommendation	Difference
1	46	50	B	4
2	52	46	A	6
3	47	47	A,B	0
4	52	43	A	9
5	51	42	A	9
6	45	43	A	2
7	46	50	B	4

Source: Created by the authors

The SAW and the COPRAS methods calculation results of evaluation with the ideal result presented in Table 8. The merge of sum for the results of separate groups calculated with the following methods not applicable. Comparator of the recommendations results calculated by TOPSIS method indicates that the tendency of evaluation analogous.

5. Conclusions

Legal regulation analysis of Agreement on Partnership, law regulating legal persons and evaluation of advantages and disadvantages criteria presents the determination of the legal form Model A or Model B for the management of clusters activities.

The proposed evaluation with multi-criteria decisions-making MCDM methods applicable to provide the recommendations for the legal form determination to manage the clusters activities, MCDM methods are widely

used for comparison and determination of the best alternative. The following recommendations presented in convenient percentage aspect.

The analysis of the results of complex evaluation has shown that the application of MCDM methods necessary to apply with the additional possible alternatives for the calculus of one-member recommendations.

Authors presented different MCDM methods incorporate different calculation principles therefore; the TOPSIS method invoked the best evaluation for the legal form determination in clustering activities, when the recommendations should be presented for a single member from several options and the evaluation results might be merged to separate groups for the calculation average values for comparison of the results.

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