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Application of AHP Method in Cities' Certification Process

Due to the global phenomenon of competitiveness, which is also present among the cities and municipalities, there is a need to evaluate the cities' strength and potential, or to estimate their value. Aswell as in case of enterprises, the value of cities and municipalities has to be expressed in certain numbers, since this enables their benchmarking, over the time and with competitors. One of the most popular methodologies for evaluating the competitiveness of cities and municipalities is the one introduced by NALED. It includes twelve criteria that cities and municipalities have to satisfy in certain percentage (at least 75%). However, the practice has shown that the successfulness of so far certified cities and municipalities in Serbia is not the same (measured by the sum of attracted direct investments). Therefore the need for the identification of the importance of certification criteria has appeared. The aim of this paper is to check whether all criteria are equally important and to point out the most important criteria for efficiently attracting direct investments. The AHP method is used to determine the weights in the multi-criteria model and the results have shown that NALED's methodology can be and should be improved.

Keywords: certification, criteria, cities, municipalities, AHP method.

1. Introduction

During the last decades competition has intensified at all levels and among different competitors. Competition is usually analysed among companies within the country, but this can be done at the global market, too. Beside companies, at the international level, states are competing for funds and investors, trying to attract as much as possible of investments for starting or accelerating the economic activity. At the same time, in addition to the states, mutual competitors within one country are cities and municipalities that compete for the same funds, investors, skilled people and so on. Cities and municipalities are rivals to each other in an attempt to emphasize their comparative advantages.

The concept of competitiveness of cities and municipalities is similar to the concept of companies' competitiveness, but it is not identical. When it is about cities and municipalities, competitiveness rests on two perspectives: one is the macroeconomic perspective – promotion of export and new markets, and the othe is the microeconomic perspective - attractiveness of cities and municipalities for investments. The role of the cities and municipalities is especially important when it comes to the latter aspect of their competitiveness. Attractiveness of cities and municipalities may be provided by fostering competitiveness of local companies, and especially by providing an attractive business environment for foreign investments.

Competition among the cities assumes decreasing the state role and centralism. Many states have reduced their impact on the local level and have increasingly decentralized their functions. In the conditions of decentralization and deregulation cities must fight alone to provide additional funds for their development.

One of the reasons for transferring the role of providing economic growth from the state level to local governments is the fast that some states have been decomposed, on one hand, and some states have been merging their territories or have been finding the ways for an increased cooperation, on the other. In such a situation, where states change their borders and join different unions and associations, cities are the only true entities, capable to achieve the economic, political and social goals, their own, but at the state level, too. Therefore, cities and municipalities have to deal with a rising unemployment, deterioration of certain companies, of jobs and the like. If local governments' actions are appropriately directed, cities and municipalities will provide support and favourable climate for investors, which means that they will become "business-friendly".

2. Local governments' role in raising competitiveness of cities and municipalities

The cities and municipalities may be considered as specific products. Their specificity lies in the fact that they have been producing - building continually, by all the people living in it, lead by local government. However, this building process never ends. They cannot be sold by their local government literally, but they sell their services and value, which is expressed through their image and reputation. The value of the cities and municipalities, as products, is conditioned by social factors and relationships rather than natural resources or physical conditions. It is a consequence of their environment, history, infrastructure, and the number and quality of people and other resources.

Local governments of cities and municipalities have to provide an environment in which new jobs can be created in the public sector, but also in the private sector. If they do not understand their role and do not take responsibility and active participation, they will become limited in the development of the cities and municipalities and face a barrier in the expansion and creation of jobs in the private sector. Local governments have to develop strategies that ensure them a competitive position in a local, national, regional, and global environments. They have to act as some kind of gates for releasing investments and, therefore, their activities and actions have to be supportive and transparent.

Competitiveness of cities and municipalities assumes that they have to achieve a competitive advantage and become recognized in the national and global environments (www.naled-serbia.org). This means that such cities and municipalities will be able to attract and retain the best enterprises, professionals, experts and foreign investors. Good reputation and appropriate analysis of the market and competition allows cities and municipalities to further improve their competitiveness and become the leaders in the national economy, and possibly in the region. Investors are always oriented to the areas where they have good return on investment and stable business environment. The rates of return on investments and the return on investments themselves are very complementary to achieving economic growth in the economy - more competitive economies are those whose growth is faster in the medium term compared to the long term (Milović, 2010). Insufficient knowledge about their own environment, trends in the macro environment, changes in the micro-environment will create insurmountable obstacles in achieving competitiveness of cities and municipalities. Therefore, market analysis, competition analysis (analysis of strengths and weaknesses of other cities and municipalities), based on the set of inputs to create strategies for future development may be the correct way of thinking about the city's future leadership in the country or in the region (Cvetanović & Mladenović 2012). To solve a problem of competitiveness and growth of the cities and municipalities, the state has to undertake certain actions (Vujovic, 2012) and (Stojanovic, 2011). However, the effects of the state may be too slow, so local governments have to actively involve themselves into the process of the improvement cities and municipalities competitiveness. Local governments have to take the responsibility and take some actions for improving the competitiveness position within the country and beyond. They have to transform their cities into business-friendly environments for attracting investors, within and outside the country. Therefore, instead of waiting for the state to react, a local government can increase the level of competitiveness of the city, municipality or region above the level of competitiveness of the state as a whole.

Cities and municipalities must act as clusters of different interests, but also as engines of economic development of the country as a whole. As mentioned above, actions that are taken at the state level are not sufficient for providing economic growth and development. Developing countries, such as this country, usually see foreign direct investments as a lever of their development. However, those investors demand certain conditions and incentives which can be provided at the state level, but sometimes also at the level of a specific city or municipality. This is the reason why some cities and municipalities take over the main role in attracting foreign investors.

In order to increase the value of the cities and municipalities, as in the case of enterprises, their local governments have to continually look forward to find new sources of capital. Local governments are best positioned to create realistic economic development strategies grounded in the specific strengths of the community, and to mobilize resources for their implementation. Usually, the idea is to attract Greenfield investments, but it is not a rare case that cities and municipalities pursue Brownfield investments. As some kind of recognition for their efforts in improving local competitiveness, cities and municipalities receive the Business Friendly Certificate (BFC) under the Programme implemented by the National Alliance for Local Economic Development (NALED) in collaboration with the Ministry of Economy and Regional Development. However, this certificate is also a sign for potential investors and a green light that the city or municipality with the BFC is a recommendable place for investing.

New investments are very important for providing economic growth of cities and municipalities. For developing countries, those investments are usually in the form of foreign direct investments, at least these kinds of investments are favourable. The reason why cities and municipalities are interested in attracting foreign direct investments is the multiplying effects (Figure 1).

Improvement of competitiveness of cities and municipalities is a long term task which assumes strategic analysis. For this analysis local government may use the same tools that are used in the enterprises for making strategic decisions. Cities or municipalities can, through the systematic analysis of positive and negative events, trends in their environment, and in relation to their internal state, make and implement adequate policies, programs and decisions. One of the tools generally used in strategic analysis is the SWOT analysis. The primary purpose of the SWOT analysis is to isolate key facts and events, and consequently facilitate the strategic approach and identify strategic problems. An integral part of the SWOT analysis, used in the strategic planning process, is an identification of opportunities and threats in the environment. Since the local government is faced with a very complex environment characterized by a large number of changes and the impact of different variables, their overall coverage and detailed analysis would require too much time and effort. Therefore, they should concentrate on the facts and events that have the highest (critical) impact on the city or municipality competitiveness.
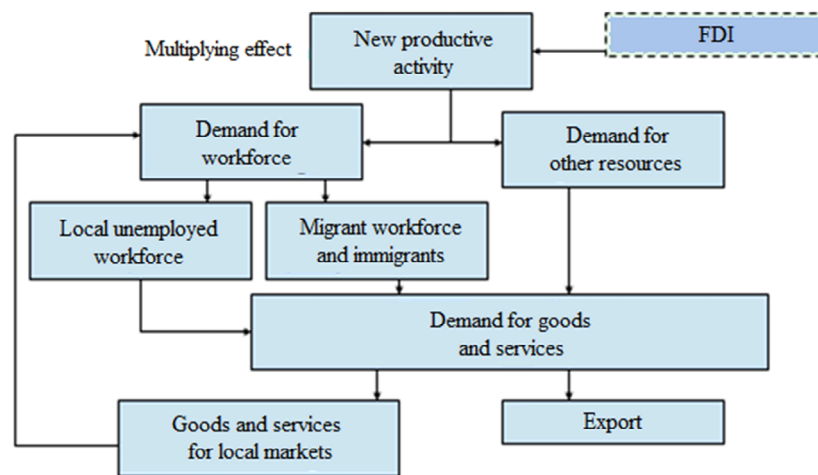

Figure 1: Foreign direct investments' multiplying effect

The other part of the SWOT analysis is concerned with internal factors or strengths and weaknesses of the city or municipality, which may be changed or improved. These factors represent the drivers or limitations of the local development. The SWOT matrix is a conceptual framework for the systematic analysis and comparison of external threats and opportunities, on the one hand, and internal strengths and weaknesses, on the other. The name of the analysis and the matrix as its concretization comes from the first letters of strengths, weaknesses, opportunities and threats. The SWOT analysis assesses the impact of these factors on the city's vision of the desired future (Table 1).

After the analysis of the four mentioned strategic perspectives, local governments have to define their "as-is" state and a strategy for the improvement of the strategic position and, therefore, for gaining competitiveness and the epithet of "favourable business environment". Local governments, or the cities and municipalities they manage, may choose one of the following four strategies:

- Maxi-maxi – assumes that the city or municipality has strengths to use great opportunities from the environment and should give the answer to the question "which is the best way for directing the strengths to use the existing opportunities?"
- Mini-maxi – assumes that the city or municipality does not have strengths for using opportunities from the environment and should give the answer to the question "what should be done for overcoming the weaknesses and providing conditions for using the existing opportunities?"
- Maxi-mini – assumes that city or municipality has strengths to overcome the threats from the environment and should give the answer to the question "which is the best way for directing the strengths for mastering the existing threats?"

• Mini-mini – assumes that the city or municipality does not have strengths to overcome the threats from the environment and should give the answer to the question "what should be done for overcoming the weaknesses and mastering the existing threats?"

Table 1: SWOT analysis for cities and municipalities

Strengths	Weaknesses
Management competences of local government, application of information technology, cooperation among local government services, simple procedures for investors, incentives for investments	Management incompetence of local governments, inadequate budgeting, **bureaucracy, paperwork, intra-orientation of government services, inappropriate usage of information technology**
Opportunities	Threats
External funds for financing local economic development, cooperation with other cities and municipalities, cooperation with European institutions, foreign investors interest in Greenfield and Brownfield investments	Political instability, isolation from other cities and municipalities, the lack of external funds for financing local economic development, great competition, the lack of support at the state level

The major strengths, weaknesses, opportunities and threats determine the attractiveness of a city or municipality. Depending on relation between strengths, weaknesses, opportunities and threats and the strategy the city or municipality has chosen, based on the SWOT analysis, the cities or municipalities can be classified in one of the following four groups (Taylor, 2000):
• The ideal city or municipality – the one that has the most opportunities and the least threats,
• The speculative city or municipality – the one that shows the high level of opportunities, but also high level of threats,
• The mature city or municipality – the one that has a low level of opportunities, but also a low level of threats,
• The problematic city or municipality – the one that has a low level of opportunities and a high level of threats.

The desirable group is the first one, and therefore every local government has to strive to achieve that kind of position. Cities and municipalities are increasingly competing with each other, especially with a purpose to attract investors and provide economic development and growth, but also to attract the best people, and to accomplish all the planned economic policies and political objectives. Therefore, they seek such a market position that would be differentiated with respect to each other. According to Richards, most of the competitive struggle among cities and municipalities concerns investments and jobs (Richards, 2001). This competition is seen through two levels, the world or global market, where cities compete to attract new companies and headquarters companies, and the own internal, state or national market where cities compete to download as many resources and incentives from various state funds, to realize their own infrastructure, cultural, social, or other development projects, on the one hand, and to attract foreign direct investments, on the other hand. In the developing countries, as this country is, competition among the cities and municipalities is especially expressed in the area of attracting foreign investments.
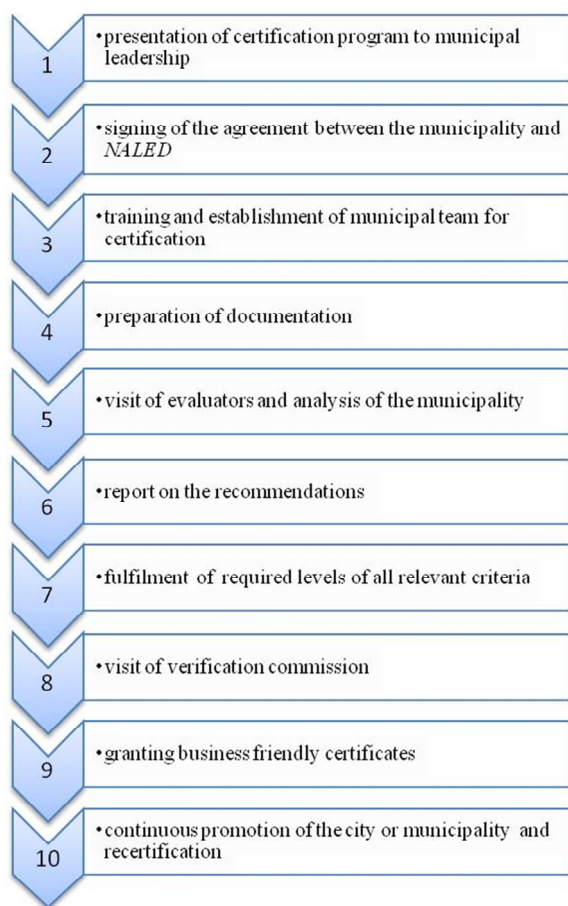
3. Evaluation of cities and municipalities competitiveness in Serbia

Serbian experience from the past has shown that there may be a significant difference in competitiveness among cities, municipalities or regions in the same country. This conclusion has been drawn upon the data that show the average wage in the cities and municipalities in Serbia. The difference in the average wage may be counted in hundreds of percentages. According to the Statistical Release from the Statistical Office of the Republic of Serbia, the greatest difference between the municipality with the highest wage and the municipality with the lowest wage is more than 300% (Statistical Release, 2012, 62/230). The cities and municipalities that belong to the lowest ranked group according to the wage per employee should seriously approach the problem of their competitiveness.

One of the possible ways to involve in the process of competitiveness improvement for cities and municipalities is the certification procedure introduced by the National Alliance for Local Economic Development (*NALED*) in cooperation with the U.S. Agency for International Development (*USAID*). The certification pro-

cedure has the aim to improve the attractiveness of cities and municipalities for investors and to provide for their growth regardless of the situation at the state level. Cities and municipalities that gain the Business Friendly Certificate should be interesting for the investors, since this certificate is some kind of guarantee of a favourable business climate. The ultimate goal of the certification is to strengthen the competitiveness of local governments, investment promotion, employment growth and raise the living standards in Serbia.

For investors, especially foreign ones, the quality of communication with the local authorities, professionalism, accuracy, and possible partnership in the future are very important. Investors evaluate the image of the local environment and the predictability of time and money that is needed for a variety of procedures, ranging from registration, through the construction of the buildings, connecting to the energy and utility supply systems and employment of labour. Certificates gained under the NALED program represent some kind of their standardization which represents a green light for both the existing and the potential investors, since they can obtain services and information in a way that facilitates the tasks and activities that fall under the jurisdiction of local governments in Serbia. The certification process includes a number of steps that NALED and specific city or municipality hahave to make. Those steps or activities are presented in Figure 1.

1	• presentation of certification program to municipal leadership
2	• signing of the agreement between the municipality and *NALED*
3	• training and establishment of municipal team for certification
4	• preparation of documentation
5	• visit of evaluators and analysis of the municipality
6	• report on the recommendations
7	• fulfilment of required levels of all relevant criteria
8	• visit of verification commission
9	• granting business friendly certificates
10	• continuous promotion of the city or municipality and recertification

Figure 2: The phases of the certification process according to NALED (www.naled-serbia.org)

According to the NALED report, European Cities and Regions of the Future 2012/2013 (www.naled-serbia.org), in the list of the TOP 10 FDI STRATEGY for Southern Europe Subotica is at the 10th place. In the list of the TOP 10 major cities for the cost-effectiveness criteria, Belgrade is at the 7th place, while at the list of the TOP 10 micro cities for the same criteria there are two towns from Serbia: Vranje (5th place) and Zajecar (7th place). These towns are in the group of those that have gained the Business Friendly Certificate. However, a lot of other cities and municipalities that have also gained this certificate are not included in the list of desirable European cities, by any other criteria.

So far, 21 Business Friendly Certificates have been awarded for 21 cities and municipalities in Serbia and only four have been noticed at the European level. Therefore, the validity of criteria included in the NALED certification process may be questioned. In order to check the validity of the NALED methodology the Analytic Hierarchy Process (*AHP*) was used as a multi-criteria analysis method. The reason for choosing the AHP method is the fact that it assumes usage of qualitative and quantitative criteria, (Saaty, 1977, 2001).

Regardless the fact that the importance of the criteria is not taken into account, the NALED gave their preference to the importance of each criterion through the evaluation of sub-criteria by which these criteria are defined. Specifically, each of the criteria has a certain number of sub-criteria (some as many as 18 sub-criteria). These sub-criteria are divided according to the importance to three groups: eliminatory sub-criteria, very influential sub-criteria and important sub-criteria. Thereby, the eliminatory sub-criteria are the most significant factors because their fulfillment is the first condition in the evaluation of the business environment by the verification commission. Therefore, the rate of this group of sub-criteria is 2, the rate of very influential sub-criteria group is 1, and the rate of the group of important criteria is 0.5. The presence of eliminatory, very influential and important criteria is the basis for determining the weights of each of the twelve relevant criteria in the model. The evaluation of importance is nothing else but the average rating of importance of sub-criteria which define the significance of the criteria. The results of this evaluation are given in Table 2.

4. Analytic hierarchy process as a method for improvement of certification methodology

The multi-criteria decision making problems are those where it is implied that a decision maker is supposed to identify the optimum course of action, considering a set of conflicting criteria. Complexity in decision making situations involves quantitative and qualitative criteria, different measurement scales, and multiple comparisons (Hwang & Yoon, 1981). The ability to assign a preference rank for general decision making situations is needed as well as simplicity of methods (Saaty, 1986). The *AHP* is a suitable method that provides a logical and scientific basis for such multi-criteria decision making problems and has been widely applied to both individual and group decision making scenarios from the early 1980s, (Saaty & Vargas, 1994) and (Wind & Saaty, 1980). The *AHP* is qa uantitative tool that has been used in almost all problems related to multi-criteria decision making and its application includes about 150 different kinds of problems (Omkarprasad & Kumar, 2006). The AHP method is a method for formulating and analyzing decisions that can successfully be used to measure the influence of many factors relevant to the possible outcomes of decisions as well as for forecasting the performance of relative probability distribution of outcomes.

According to Saaty (Saaty, 1986), the AHP was founded on three design principles: (i) decomposition of the goal-value structure where a hierarchy of criteria, sub-criteria, and alternatives is developed, with the number of levels determined by the problem characteristics; (ii) comparative judgments of the criteria on single pair-wise comparisons of such criteria with respect to upper criteria; and (iii) linear-based synthesis of priorities where alternatives are evaluated in pairs with respect to the criteria on the next level of the hierarchy, and the criteria can be given a priority (e.g. preference) expressed as a weight in the AHP matrix.

Let the problem be defined as a general problem of multi-criteria analysis, where it is necessary to evaluate the *m* of available alternatives, on the basis on *n* relevant criteria. On the stage of decomposition, the problem is viewed as a hierarchical structure, where the goal is on the top, while the criteria by which a decision is made are treated at the lower levels. At the lowest hierarchical level is a range of alternatives, among which it is necessary to make comparisons.

The next phase involves, in addition to collecting data, their peer evaluation. First of all, pair-wise comparison of criteria and alternatives is made at a given level of hierarchy, but also in relation to the criteria of the directly higher level. Pairwise comparison of alternatives is done in response to the question on which of the two observed attributes that characterize an alternative to the given criteria is better in terms of meeting the criteria and contribution to the certain objective. The strength of preference is expressed by the ratio scale with increments of 1-9. The preferential level of 1 shows equality of observed attributes, while the level of 9 indicates absolute, the strongest preference of one attribute over another (Ma, & Zhang, 1991; Leskinen, 2000). Such a scale was formed by Saaty and Vargas (Saaty & Vargas, 1994) and it is used in the essential AHP method and in its entire later advanced variants (Analytic Network Process - ANP). Thus, the defined scale allows comparisons in a limited scope, while the perception is sensitive enough to make a difference in the alternatives importance.

Based on pair-wise comparison of alternatives, the reciprocal matrix can be formed (dimension $n'n$ on the criteria level, or $m'm$ on the alternatives level), where the elements $a_{ii} = 1$, while the elements a_{ji} are the reciprocal of the elements a_{ij}, i.e. $a_{ji} = 1/a_{ij}$, i ¹j and $i, j = 1, 2, ..., n$. According to the experience of certified cities and municipalities, based on the expressed preferences of the decision-maker (Table 2) the problem is defined as non-equal importance of all twelve criteria used under the NALED methodology. Based on the relationship between the criteria and the level of fulfilment in each city or municipality, through pair-wise compilation according to Analytic Hierarchy Process method, the Reciprocal matrix has been defined (Table 3).

Table 2. The significance of the criteria according to *NALED*

Criterion	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}
Criterion rate	1.250	1.050	0.950	0.900	0.660	1.000	0.800	1.100	1.250	0.850	0.750	1.150

Table 3. Reciprocal matrix for business friendly certification model

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}
C_1	1	3	4	4	8	3	6	2	1	5	6	2
C_2	1/3	1	2	3	6	1	4	1	1/3	3	4	1/2
C_3	1/4	1/2	1	1	5	1	3	1/2	1/4	2	4	1/3
C_4	1/4	1/3	1	1	4	1/2	2	1/3	1/4	1	3	1/4
C_5	1/8	1/6	1/5	1/4	1	1/5	1/3	1/6	1/8	1/4	1/2	1/7
C_6	1/3	1	1	2	5	1	3	1/2	1/3	3	4	1/2
C_7	1/6	1/4	1/3	1/2	3	1/3	1	1/4	1/5	1	2	1/5
C_8	1/2	1	2	3	6	2	4	1	1/2	4	5	1
C_9	1	3	4	4	8	3	5	2	1	5	6	2
C_{10}	1/5	1/3	1/2	1	4	1/3	1	1/4	0.2	1	2	1/4
C_{11}	1/6	1/4	1/4	1/3	2	1/4	1/2	1/5	1/6	1/2	1	1/5
C_{12}	1/2	2	3	4	7	2	5	1	1/2	4	5	1

The Reciprocal matrix is the basis for determining the priority vector. The priority vector actually means determining the significance of the criteria used by the NALED. Priorities, according to the AHP method are presented in Figure 3.
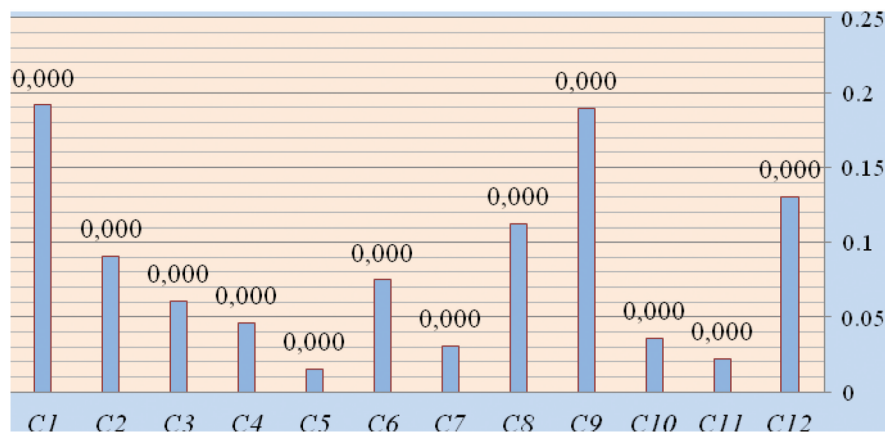
Figure 3: The estimated significance of the criteria for Business Friendly Certification

The results show preferences of the NALED in terms of the importance of all relevant criteria in the business friendly certification model. In this particular case, the AHP method is used to determine the weights in the multi-criteria model, not the ranking of alternatives, which is its most common application. Similarly, the AHP is a well known method of determining the subjective preferences, or subjective approach to determining the weight coefficients in the model (Srinivasan & Shocker, 1973; Fan, Ma & Tian, 1999). Such results will be a starting point for further exploration of authors that includes integration of weights obtained by different approaches - subjective and objective, in line with contemporary trends in research in the field of multi-criteria analysis, ((Fan, Ma & Tian, 1999; Uden, Kwiesielewicz & Kwiesielewicz, 2003).

Conslusion

Determining the importance of the criteria in the multi-criteria model is one of the key issues in the multi-criteria analysis. This is the main reason why a whole range of methodologies are developed to be used to determine the weight coefficients in the model. One of the best known methods used for these purposes is the AHP method. The AHP method is a subjective approach to the decision making methodology, because the result obtained by its applying is directly conditioned by the subjective preference of the decision maker(s).

The paper presents the AHP method applied for calculating the importance of the criteria in the model for certification of cities and municipalities as favorable business environments. The contribution of this paper is to improve the existing methodology applied by the NALED. Namely, in the previous procedure, the NALED did not take into account the importance of the criteria, but only the level of fulfillment. In this way a scientific approach to the existing methodology is introduced.

The future authors' research will be focused on the application of some objective methodological approaches to determining weights in the business friendly certification model of cities and municipalities, as well as on combining those two approaches and on integration of the results.

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Marija Anđelković Pešić is an Assistant Professor at the Faculty of Economics, University of Niš for a scientific field of Business Management (courses: Enterprise Resource Management, Business Process Management, Quality Management). She gained the MSc and PhD degree at the Faculty of Economics, University of Belgrade. She is a member of the Serbian Royalty Association of Academics, Innovators and Scientists since 2011 and a permanent member of Organizing Committee and Vice-chairman of the International Conference ⬚Economics and Management - Based on New Technologies⬚. Currently she is involved in two projects financed by the Ministry of Education and Science of Republic of Serbia. So far, she has published more than 100 papers, including books, articles and papers published in the thematic collections of papers (presented at the conferences). She was a researcher at the University of Economics and Business Administration, Institute for Production Management, Vienna, Austria, in April 2005, June 2009, and September 2011, under grant program - WUS Austria. Also, she won a scholarship under JFDP (Junior Faculty Development Program) and spent four months as a professor and researcher at Willamette University, Atkinson Graduate School of Management, in Salem, Oregon, the USA.

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Born in Nis , 7 March in 1980. B.Sc. in Agriculture, Master of organization and economics of production, in the final stage of a doctoral studies at the Faculty of Economics, University of Niš with a thesis on "Models of optimizing the manufacturing capacity location decision making in the function of local economic development." Author of over 20 published scientific papers. Over 11 years of practical experience in: foreign and domestic companies in managerial positions, with entrepreneurial experience and work in development programs. Experience in work in public sector as: a member of the Regional Development Council of the Government of the Republic of Serbia for the Southern and Eastern Serbia, member of the Board of the Regional Development Agency South, director of the Free Trade Zone South, CEO of the Business Incubator Center in Nis. Managed the project: attraction and support of the implementation of FDI worth over 100 million euros , whose realization creates over 5,000 new jobs: Yura Corporation, Yura Eltech , Dytech, Benetton, Frucom Handels, Harder Digital, Johnson electric, Leoni, Mikkelsen electronics and over 10 domestic investment, managed the process of developing strategic documents: Strategy for the development of the city of Nis to the 2020th, The Action Plan 2010 - 2014.; Development Strategy of SME development, etc. Since February 2009 employed as the Head of the Local Economic Development of the City of Niš. Hired as a local consultant for the Board for LED in the Standing conference of towns and municipalities of Serbia. Deputy chairman of the National alliance for local economic development, the Local economic development expert forum.