APPLICATION OF AHP MODEL FOR EVALUATING TAKEOVER BIDS IN PRIVATIZATION – CASE OF CROATIA

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ABSTRACT

In this paper we demonstrate the application of AHP in ranking takeover bids in privatization projects in Croatia. Multicriteria decision making technique, Analytical Hierarchy Process (AHP), which utilizes a multi-level hierarchical structure consisting of objectives, criteria, subcriteria, and alternatives, is applied in selection of an appropriate takeover bid. The input from the experts has been used in pairwise comparison matrix in order to rank the takeover bids. The data collected by AHP-structured pairwise comparisons were constructed into a computer-based program called Expert Choice. The paper shows that AHP is a viable tool for rank ordering of takeover bids following various weighting schemes.

Keywords: Privatization, Analytical Hierarchy Process (AHP), Croatia

1. Introduction

This paper describes the process and application of AHP in ranking takeover bids in privatization projects in Croatia.

The process of transformation of social enterprises and privatization in Croatia had and still has a significant importance in the functioning of the socio-economic, political and social system. There is not a problem domain that has caught so much public attention in Croatia as did problems of transformation and

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privatization, which has so far demonstrated great adversity and has brought to the surface many problems that impact the Croatian society at all levels.

This paper has two main objectives. First, it aims to define a fixed set of criteria that should be the basis for evaluating decisions about the quality of takeover bids received from the tender offers made by the Croatian Privatization Fund. The second objective is the creation of a computer model, based on the mathematical methods of the Analytical Hierarchy Process, which represents a platform for the development of any particular decision-making problem.

The process of application of an analytical hierarchy process to the underlying problem of choice has been implemented through five basic steps. First step was to identify the former practice of criteria selection and preparation of the basic elements for implementing the analytical hierarchy process. Second step was the simulation of the decision-making process of several decisions already made by the Croatian Privatization Fund. After the first two steps there was a series of workshops in order to determine the basic criteria of the takeover offers and their hierarchy which represents the third step of the study. Sixteen basic criteria were indentified in the analytical hierarchy process as well as the possible values or ranges of values of these criteria (for continuous variables). The fourth step was to define a model of decision making and then, in the final step of the study, a series of workshops was held with the examples of evaluation of the takeover bids with the purpose of training the employees of the Sales Department of the Croatian Privatization Fund (CPF) to use the software for the implementation of the Analytical Hierarchy Process.

2. Privatization in Croatia

In the past twenty years, the role of state ownership in the world economy has been continuously decreasing. Since 1979 until today, the GDP recorded in state-owned enterprises fell from more than 10% to about 6%. Such a drastic reduction in the gross domestic product achieved by the state-owned enterprises is primarily the result of a restructuring of economies which was conducted during the 1990s in developing countries (Megginson and Netter, 2001). Privatization has been imposed as an imperative because neither state nor public ownership could withstand the competition of private property (Vojnić, 2000).

If we ignore the differences in the context of privatization between the developed and transition countries, their common denominator is - depoliticization of the economy, i.e. the reduction of political influence on economic activity. Therefore, privatization can be defined as „a combination of reallocation of control rights over employment and an increase of cash flow ownership by managers and private investors" (Boycko, Shleifer , and Vishny, 1996). Privatization, on one hand, implies a transfer of control and authority to managers (corporatization), and on the other hand - a reduction of state ownership in favor of managers and outside shareholders. Such a transfer is desirable because of the restructuring, but in practice it can also lead to results contrary to those desired.

Privatization models differ with respect to: techniques of implementation, the ownership structure after privatization, and the way the company itself operates. The choice of the privatization model is not easy and should be based on the set objectives and the understanding of relevant circumstances of the privatization process. The choice of a privatization model, among other things, is determined by (1) goals set by the state; (2) the current organizational form of public enterprises; (3) the financial conditions and performance of public enterprises; (4) public sector in which company operates; (5) ability to mobilize private sector resources; (6) the degree of capital market development and (7) socio-political factors (Vuylsteke, 1988).

Each model has different implications for the exercise of political and other objectives. Actually, the choice of the models reflects different priorities, such as: maximizing revenues, improving government administering and efficiency, the introduction of technology and managerial know-how and expertise, capital market development and promoting a culture of capitalism (Mahboobi, 2002). Privatization processes are always accompanied by processes of deregulation of the economy and creation of such an atmosphere by the state that provides protection and encouragement of a competitive economy.

There are many classifications of the privatization model. Thus we can distinguish the following possibilities:

A. Privatization models without the transfer of ownership (*Non-divestiture options*)
1. Management privatization models
- Contracts of management
- Leasing
- Concessions
2. Joint ventures
3. „Contracting out" method
4. Public-Private partnership

B. Privatization models with the transfer of ownership *(Divestiture options)*
1. Reprivatization
2. Direct sale
3. Sale to the highest bidder
- Auction sale
- Sale through a competitive bidding
4. Selling shares in the capital market *(Share Issue Privatization)*
5. Selling shares to management and employees
- MBO and MEBO
- ESOP
6. Mass privatization
7. Strategic alliance by exchanging ownership stakes
8. Privatization through selling assets
9. Other models and techniques.

Choosing an appropriate model of privatization depends on many factors - economic and legal. Each of the above models has certain advantages and, also, it would be useful to do an economic analysis, using economic methods and analytical concepts of efficiency, transaction costs on law and social institutions. Such interdisciplinary research complements legal and economic knowledge in a way that combines the reality of an economy that operates even more in the normative framework and realities of law, whose social objective depends on the circumstances of economic and social criteria (Mlikotin-Tomić, 2003).

3. Advantages of the Analytical Hierarchy Process (AHP) in ranking of takeover bids in privatization projects

Before multicriteria analysis was developed, the problem of selection and ranking of different decisions was usually boiled down to a single criterion optimization tasks. The criterion is defined as a measure by which we evaluate of a certain decision with respect to the same point of view.

AHP (Analytical Hierarchy Process) is one of the most popular scientific method of scenario analysis and decision making with consistent valuation of hierarchy whose elements consist of objectives, criteria, sub criteria and options or alternatives. Analytical Hierarchy Process is a class of methods used for soft optimization. Basically it is a tool for creating and analyzing decision-making hierarchy. AHP primarily enables an interactive creation of a hierarchy of problems as a preparation of scenarios, and then a pair-wise comparison of hierarchy elements (objectives, criteria, options) in the top-down direction. In the end it makes a synthesis of all the evaluations, and, in a strict mathematical model, it determines weight coefficients of all the elements in the hierarchy. The sum of the elements' weights coefficients at each level is equal to 1, which enables the decision makers to rank all the elements in the horizontal and vertical sense. AHP enables an interactive sensitivity analysis of the evaluation process on the final ranks of elements in the hierarchy.

The analytical hierarchy process is flexible because it allows us to find a relatively simple relationship between the influencing factors in complex problem with many criteria and options, or recognize their explicit or relative influence and importance in realistic conditions and determine the dominance of one factor compared to other. This method anticipates the fact that even the most complex problem can be broken down into a hierarchy, and so that in the further analysis quantitative and qualitative aspects of the problem are included. AHP holds all the parts of the hierarchy in a relationship, so that a change in one factor affects the other factors.

Past decisions on the best takeover bids received on a tender by The Croatian Privatization Fund were characterized by a fickle set of criteria. New criteria were often put in the decision making process, which a function to correct the problems resulting from an incomplete „rules of the game". Such an approach of „trials and errors" needs to change and this study suggests a continuous set of criteria that should be the backbone of every selection problem.

4. The criteria for evaluating takeover bids using the analytical hierarchy process method

The key criterion of the selection problem is the overall quality of bids received for the tender by The Croatian Privatization Fund. This criterion can be called The winning bid. A fundamental criterion is derived from the four sub-criteria: (1) financial component, (2) the quality of the bidder, (3) competitive ability, and (4) the social component. All the criteria were derived and are resulting from the additional sub- criteria.

The Financial component criterion arises from the two input sub-criteria: (1) price and (2) the amount of servicing liabilities to state creditors. Price is a quantitative criterion that bidder states in monetary units, i.e. Croatian kunas (Croatian national currency). „The amount of servicing liabilities to state creditors" criterion is provided when the subject of selling is a company that sells under „ the special conditions" and the bidder is not required (as an eliminating criterion) to settle all liabilities to state creditors (leaving the possibility of debt write-off). The values that this criterion can obtain are also quantitative, and can be expressed as a percentage of the total debt to state creditors, which the bidder agrees to pay.

The second sub-criterion „The quality of the bidder" presents an analysis of the legal or natural person who has registered for the tender. This criterion consists of two input criteria: (1) The assessment of the creditworthiness of the agency and (2) The experience in the sector in which the subject of the tender operates. Each bidder is assessed by the agency that the CPF employs. The result of the agency assessment may be one of the four ranks: (1) very low risk, (2) low risk, (3) high risk, (4) very high risk. The result of the agency may also be that the solvency of the bidder cannot be assess what is than referred to as a very high risk The experience in the sector in which the company operates is an especially important element in

assessing the quality of the bidders in some tenders (e.g. tourism facilities). The values that this criterion may obtain include: (1) bidder operates in the same industry; (2) that is not the bidders primary activity but he has already established contact with the appropriate managers; and (3) has no experience in the industry.

The third sub-criterion, Competitive ability, includes the perspective of the company, which is the subject of the tender, after the completion of privatization. This criterion has to identify the key determinants of company's future envisioned by the bidder. A complex system of assessment of the company's competitive ability makes it difficult to precisely definite this criterion. We can distinguish the three main elements of competitive ability - three input criteria: (1) market strategy (2) portfolio of business activities, (3) investment that the bidder commits to undertake. The future of the proposed market strategy can be estimated. An open question is how the experts for the evaluation will be hired, since there is a large number of professionals, each an expert in business in a particular industry. Market strategy can be assessed as poor, average or good. In addition to business strategy, for the future of the company it is also important in which markets will it compete (corporate strategy). The assessment of the quality of resource allocation to each existing and new business units would be best made by a team of experts who are able to assess trends in individual industries. The concept of a business activities portfolio, for each bid, could be defined as (1)a bad concept, (2) an average concept, or (3) a good concept.

Investment in the company after privatization is a derived criterion from these input criteria (1) planned investment at a discounted value, and (2) investment from own resources. The planned investment is a quantitative variable that is expresses as an amount of investment in Croatian kunas. The discounted value was taken, in order to take into account of time variable of investment. The second criterion, Investment from its own resources, is also a quantitative variable, and includes a percentage of own investment in the total investment. A higher percentage of own investments is considered a better criterion value. It should be noted that the decision making model implies making a firm stand regarding the implementation of the elements of the bid. In other words, to obtain an adequate privatization result it is necessary to ensure the monitoring and implementation of all the key elements of the bid, primarily the amount of investment.

The last sub-criteria used to define the key criterion is the Social component. This criterion is derived from the three input criteria: (1) retaining the existing number of employees; (2) the number of new hires and (3) respecting for the rights of the collective agreement.

5. Evaluation of the takeover bids from the tender by The CPF using the analytical hierarchy process method

Using the analytical hierarchy model of decision making it possible to systematically analyze and follow the steps and sub-decisions that were made in decision making process. As the number of criteria rises, the inability to appropriate re-analyzing the decision grows exponentially. The following describes the process of selecting the underlying selection problem by using Expert Choice. Creating an analytical hierarchical model by using Expert Choice application begins by defining the goal. In this case the goal is evaluation of takeover bids from the tender by The CPF, which we market with the expression „The winning bid". In the next step predefined criteria are inserted into the software. As previously stated, the selection problem is based on four main criteria: financial component, the quality of the bidder, competitive ability, and the social component. After defining the model, we show an example of the selection problems, which has four alternatives where for each alternative we mark the values of certain options for certain criteria.

The criteria vary with respect to the input. The model for one part of the criteria allows direct input, which, by a set of logical-arithmetical rules, compares the value of an option with other options (*direct*). For the second set of criteria values are entered in the form of ordinal scale (ratings).

The method of analytical hierarchy process is particularly useful for the underlying selection problem because it allows the comparison of the key criteria before making a decision, i.e. already in defining the conditions of the tender. This option improves the quality of the received bids and provides a higher level of transparency in decision making.

In the next step of the implementation of the analytical hierarchy process two alternatives, with respect to a certain criteria, are being compared. This procedure is performed until all the combinations of alternatives are compared and the whole process is repeated with each of the criteria.

Upon completion of entry of the criterion value software gives the final result and the analysis of options by certain criteria. Expert Choice application provides a large number of charts to facilitate the comparison of options.

6. Conclusion

Transparent measuring and adequate comparing of the received bids is impossible to achieve in the event that in the tender offer the criteria are not defined as well as the values that can be offered by a certain criteria. On the other hand, tightly defined criteria, disclosed before the announcement of the tender, will discourage potential „good faith" bidders. Transparency and the possibility of comparison of bids will result in changes in the current process of bid processing in The CPF as well as in the prescribed bidding documentation.

The evaluation process of the received takeover bids is a complex process during which it is desirable to define the weighting coefficients that certain criteria will have in the bids evaluation process, which gives additional explication of the selection problem - using mathematical method of the analytical hierarchy process. The reason is that the CPF portfolio comprises of companies that have very different characteristic; with some companies the price is a key criterion, while in other a very important criterion is also the social component of the bid. To accept that possibility the model made is based on the analytical hierarchy process using a computer application Expert Choice.

Using the proposed methods to support decision-making process for evaluation of received bids from the open tender of The CPF can be performed easily and with a higher level of transparency than before.

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