

ASSESSING CORPORATE GOVERNANCE IN LACK OF ASSURANCE CONDITIONS BY USING FUZZY LOGICS

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Abstract

Corporate governance has changed into a very crucial investment decision making element for investors. The amount of investors' investment increases as much as the observing of corporate governance principles increase. Thus, companies' ranking regarding corporate governance can present valuable information for users. Corporate governance criterion is a criterion through which the amount of observing the principles of corporate governance by the companies is shown. The existence of this criterion besides company rankings can be effective for investors, auditors and the public to judge about these companies. So in this paper we will try to propose our new criterion entitled: "Fuzzy corporate governance criterion" and its fundamental concepts based on fuzzy logical theory. The methodology based on fuzzy logical theory has improved and developed inexact and vague estimates of traditional assessment methods. This methodology has presented a new type of corporate governance (CG) criterion called Fuzzy corporate governance (FCG). Transparency and disclosure, ownership structure, board of directors' structure and owners' equity are among key variables in corporate governance which have been unified in fuzzy model in this research to gain an acceptable criterion for assessing corporate governance.

Keywords: Corporate Governance, Fuzzy Logic, Transparency and Disclosure, Board of Directors' Structure, Ownership Structure, Owners' Equity

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Introduction

Financial scandals in some big and famous corporations in the world in recent century such as those in Anron and Worldcom reduced public reliability towards the data and financial reports published by the companies [4]. To resolve the problems above, corporate governance concept is one of the most important concepts posed in the recent 2 decades. Corporate governance reduces agency risk by increasing supervision over the activities of the managers and is accompanied by risk reduction resulted from financial crisis. Thus, assessing the companies regarding corporate governance provides useful and valuable information for beneficiaries. The result of this assessment is a list of the best and the worst companies. The terms, "the best" or "the worst", may create ambiguity in ranking the companies. Fuzzy logic was presented to avoid ambiguities in

dealing with words and statements which are inaccurate and ambiguous and give considerable additional information in assessing the reports and help to reduce the limitations of traditional assessment methods. Thus, in this research we used 4 important characteristics of joint leadership systems such as board of directors' structure, transparency and disclosure, ownership structure, and stockholders' equity to devise a suitable corporate governance criterion through fuzzy tools.

Corporate governance:

Corporate governance is set of control tools that use rules, regulations, structures, cultures and systems to achieve the goals of accountability, transparency, justice and the rights of beneficiaries [8]. Anyway, the principles of corporate governance system are deemed to be more important than the definition for corporate governance itself. We can mention the

following items from among attempts done to determine the principles of corporate governance:

Devising a basis for the effective framework of corporate governance, stockholders' equity and major functions of ownership, the role of beneficiaries in corporate governance, emphasis on ethical standards and responsiveness, observing the fairness in financial reporting, the fair system for performance rewarding and adjustment of the authorities with responsibilities, risk management, disclosure and transparency, board of directors' structure [5]. Each of the principles mentioned above can be thought of as a basis for ranking companies regarding corporate governance. Although the suppliers of the recent rankings can not expect to reach a consensus in ranking structure based on corporate governance, some similarities can be detected in these rankings. The point which all parties agree about is that the ranking should be based on transparency and disclosure, board of directors' structure, ownership structure, and stockholders' equity, although their approaches in collection, grading and weighing the information are different [3].

Transparency and disclosure:

Transparency and disclosure of the data in a company is one of the key items in controlling and effective support of stockholders and they have a great role in company's leadership system. Transparency can be introduced by the concepts such as: Correctness, Adjustment, Appropriateness, Completeness, Resolution, Timing, and Convenience [7].

Board of directors' structure:

Board of directors is among the internal mechanisms of corporate governance which greatly affects the company's performance and observing the rights of beneficiaries in an entity. Board of directors is responsible for supervising the managerial performance and achieving a suitable yield for stockholders, observing the rules and avoiding the presence of benefits' controversies besides strategic leadership of the company.

Ownership structure:

Ownership structure in the companies can be effective in creating and developing the model for corporate governance. The stockholders' composition and ownership concentration amount are two principle aspects of companies' ownership structures[6]. Institutional investors reduce agency

problems resulted from the isolation of ownership and management and can have a fundamental role in improving corporate governance system. Managers' ownership can accord the benefits of managers and stockholders and reduce agency problems for both parties. Ownership concentration also is one of the resolutions which can reduce agency problems. In companies where ownership is widely spread, stockholders have a weak effect on company management and this will result in creating more agency problems.

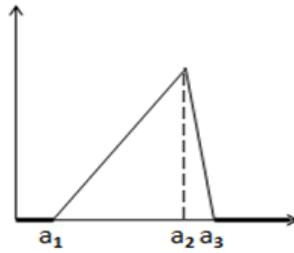
Stockholders' rights:

Stockholders are important players in corporate governance. Because they supply the capital for the companies and retaining their reliance is highly important. In ranking the company based on the stockholders' rights, the boundary in which company's legislation has been designed to preserve stockholders' benefits, efforts to include stockholders in the meetings, the power to vote and the benefits of each beneficiary, the range in which stockholders' equity are supported by the company, and the amount of stockholders' power functions are measured [3].

Fuzzy set theory and controlling (assessing) fuzzy logic:

Fuzzy set theory was first posed in 1965 by professor Lotfizadeh to quantify the amount of lack of absoluteness and inaccuracy. The main goal in fuzzy set theory was to express lack of absoluteness in knowledge by quantifying inaccurate data. In fact, fuzzy sets were presented to deal with inaccurate words and statements. Membership function $\mu(x)$, includes real numbers of $[0, 1]$ which shows that the membership degree belongs to a fuzzy set. The bigger amount of a member's degree (nearer to 1), shows the high intensity of the member in the set. If a membership degree equals zero or one, it means non-membership and complete membership, respectively. Fuzzy numbers are convex and normal fuzzy sets with membership function of $\mu(x)$ which show normalness and convexity. Fuzzy numbers can be triangular, trapeze and bell shaped. Fuzzy numbers used in this research are triangular fuzzy numbers. Triangular fuzzy numbers (TFN) are a special type of fuzzy numbers which are defined by a triangle a_1, a_2, a_3 which is shown in figure (a). These parameters show the least, the most probable, and the highest possible value, respectively.

Figure (a). Triangular fuzzy numbers (TFN)



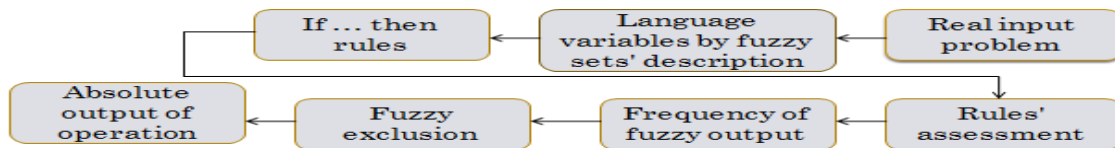
Membership function for a triangular number is determined as follows:

1. $\mu_A(x) = 0$ when $x < a_1$
2. $\mu_A(x) = (x - a_1) / (a_2 - a_1)$ when $a_1 \leq x \leq a_2$
3. $\mu_A(x) = (a_1 - x) / (a_3 - a_2)$ when $a_2 \leq x \leq a_3$
4. $\mu_A(x) = 0$ when $x > a_3$

Fuzzy logical models use fuzzy sets to study and describe the complicated and inaccurate phenomena and use logical operations for conclusion. Fuzzy sets (especially fuzzy numbers) and fuzzy logic which is used in controlling form a set of knowledge called fuzzy logical controlling (FLC) which are very effective in dealing with

controlling problems in an indefinite and inaccurate environment and where we do need much accuracy and the goal of controlling entails accessible variables for measurement or estimation[1]. The block figure for controlling processes is shown in the figure below.

Block figure of Fuzzy Logical Controlling process



The process of FLC is used step by step on corporate governance ranking.

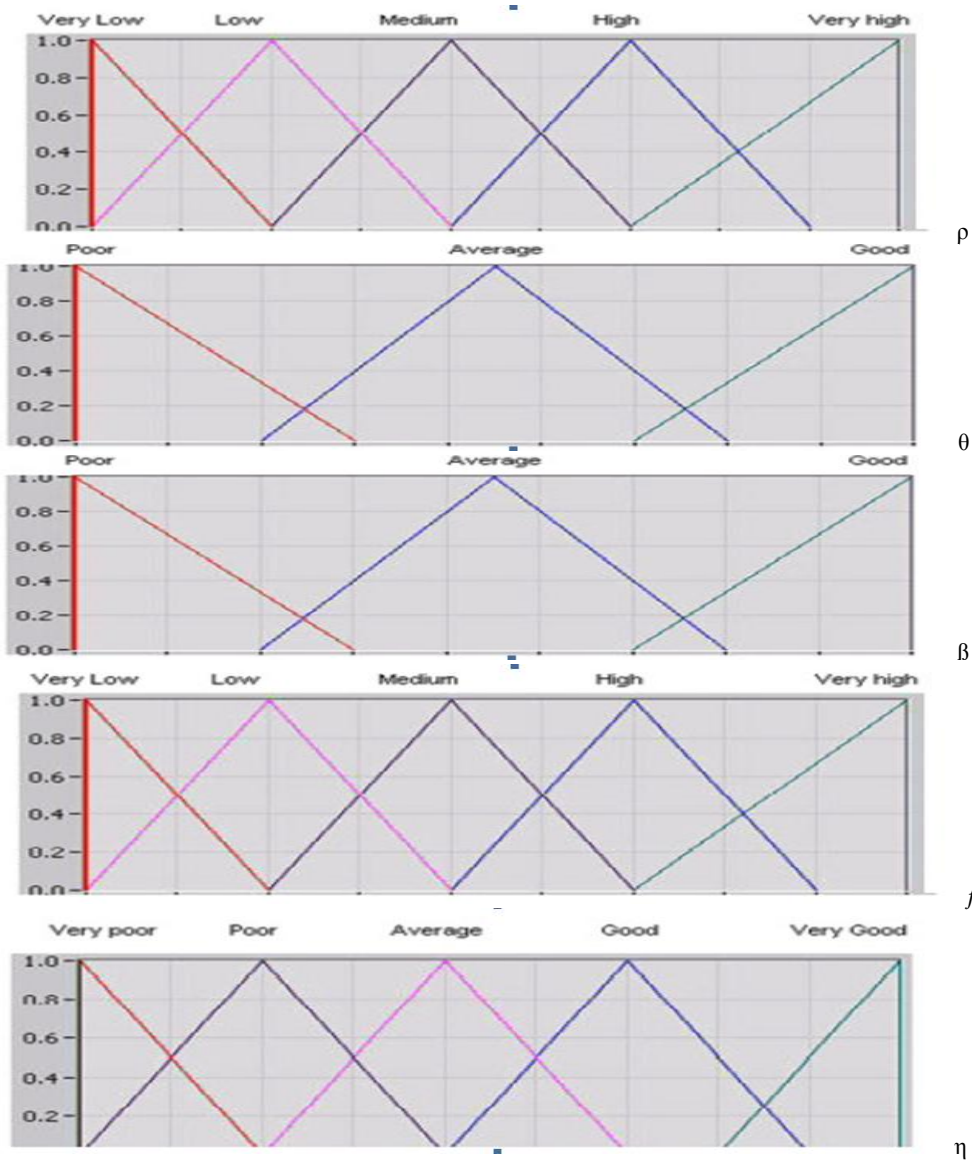
Fuzzy Logic in designing Corporate Governance (CG):

Companies are assessed based on the quality of financial data, stock ownership and activities by board of directors, etc. The result is a list of the best and the worst companies. Thus the terms "the best" and "the worst" may cause ambiguities in ranking the companies and determining badness or goodness exactly. Fortunately fuzzy logic can give us additional data in a broad range to assess the reports and help us to reduce the limitations of using the traditional assessing methods. So, Including FL in corporate governance can approve different degrees of corporate governance through the planning of fuzzy model and present a new criterion called Fuzzy Corporate Governance (FCG).

Fuzzy logical controlling issues have inputs and outputs which are considered as language variables.

In this research transparency and disclosure, board of directors' structure, ownership structure and stockholders' rights are input language variables and the rank of corporate governance is output language variable of the system of fuzzy corporate governance. ρ stands for transparency and disclosure, θ stands for board of directors' structure, β stands for ownership structure, f stands for stockholders' rights, and η stands for corporate governance ranking. Here the triangular numbers are used to represent input and output parameters of the system. Each variable should be expressed in different shapes and levels in order to relate to the fuzzy set. For example, for variable ρ different levels (language terms) presented are very low, low, medium, high, and very high. Language term for the variables θ , β , f and η are also represented in figure (D) along with the related triangular number.

Figure (D)



Then conditional rules are devised by the skillful scholars. For example, a conditional rule is expressed as follows: if ρ is low, and θ is poor, and β is poor, and f is low, then η is very poor.

After determining language terms for each of the variables, their fuzzy number definitions will be mounted on the figure and then if ... then rules will be entered and after that input variables will be entered into fuzzy system. Inputs should be entered into fuzzy systems as numbers. In other words, first we should prepare a checklist of the 4 characteristics of corporate governance (board of directors' structure, transparency and disclosure, ownership structure, stockholders' rights). These criteria are driven from Stock Exchange corporate leadership system's regulatory booklet. Observing each of these criteria by a company is considered to have one credit for the characteristic under investigation. For example, if the characteristics common between chief director and the head of

board of directors is considered to be a criterion to determine the ranking for board of directors' structure would be 1, if the chief director is not head of board of directors, otherwise it would be 0. Finally a rank based on a marks criterion of 10 would be assigned for ρ , θ , β , f and η . Input variables are implemented in fuzzy model and after assessment the frequency rules and fuzzy elimination of corporate governance ranking will form the system output. Fuzzy software can foster fuzzy implementation, inference and fuzzy elimination process.

Conclusions

Having good corporate governance is essential in launching an exact and permanent framework for an efficient capital market, increasing the investors' reliance and absorption of capital flow in industries. Thus, creating organizations which can calculate

corporate governance is necessary because the existence of such a criterion can be effective for investors, auditors, policy makers and the public people besides ranking the companies [2]. In this paper, we discussed about how fuzzy logic can be a suitable tool in ranking corporate governance and creating a suitable corporate governance criterion. Four important variables of corporate governance as: Transparency and disclosure, ownership structure, board of directors' structure and owners' equity were unified in this paper to achieve an acceptable ranking of corporate governance in the fuzzy model of this research. Fuzzy logical ranking process needs a concise system to achieve the best rank (number) for input variables, although this may be time consuming at first. After the system is created, governance rank will be identified through fuzzy system automatically. Locating the companies in low rankings of governance is an alarm for the management in those companies to pay more attentions to corporate governance issues [3]. Also if a company has a low ranking in a certain variable, it should be able to suggest an enhancement program.

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