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Corporate governance assessment in company board structure

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There is a plethora of publications on Corporate Governance (CG) in today's business world press. While many corporate companies have been practicing corporate governance, the justification for good corporate governance must be a greater concern rather than mere corporate transparency. Rankings in corporate governance become an important issue to oversee/judge companies who practice governance. Fuzzy logic is a powerful tool that has been used in diverse fields of applications ranging from engineering to business or finance. This paper applies the tools of fuzzy logic to design an approach that will rate the level of application of CG. Financial Disclosure (FD) and Board Structure (BS) will be the key variables that would be employed to achieve this task. The integration of a fuzzy logic model to CG will be highlighted graphically in order to enhance the findings of the research.

Key words: Corporate governance, fuzzy logic, financial disclosure, board structure.

INTRODUCTION

Failures of business in which deficiencies of financial reporting and corporate disclosures have figured prominently are not new phenomena. In the wake of high-profile scandals such as Enron, WorldCom, Global Crossing, Adelphia Communications, Tyco and Xerox have clearly demonstrated that current financial reporting standards and corporate governance (CG) are either inadequate or have not been fully complied with. The crux of issue is that CG practices have becoming a far more important element of the investment decision for institutional investors. At the same time, these have had a negative and cumulative impact on the way informed opinion currently views financial reporting. As Drake (2003) evidently showed that the increasing number of codes of best practice developed by leading international bodies such as the OECD, the Commonwealth and CalPERS, corporate governance reform has become a key global issue. There is a widespread consensus about

the need for framing corporate governance issues into the contest of corporate law, as was done in the earlier work of Easterbrook and Fischel (1991).

The governance problems that have come to light over the past years have thrust the quality of corporate governance structure, the professionalism of auditors and governance practices of major companies into the limelight. These issues have triggered a spate of regulatory reforms in the United States and also in the Asian Region. A report issued by the United Nations Conference on Trade and Development (UNCTAD) in March 1999 considered the corporate reporting implications of the financial crisis. The report stated that:

"The failure or near failure of many financial institutions and corporations in the East Asian region resulted from a highly leveraged corporate sector, growing private sector reliance on foreign currency borrowings and lack of transparency and accountability. A crucial role that is played by disclosure deficiencies and lack of appropriate disclosure requirements indirectly contributed to the deficient internal controls and imprudent risk management practices of the

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corporations and banks.”

While a multiplicity of factors affect the governance and decision-making processes of firms, and are important to their long-term success, governance problems that result from the separation of ownership and control should be focused on. The degree to which corporations observe basic principles of good CG is an increasingly important factor for investment decisions. Of particular relevance is the relation between corporate governance practices and the increasing international character of investment. CG is also affected by the relationships among participants in the governance system. Controlling shareholders, which may be individuals, family holdings, bloc alliances, can significantly influence corporate behaviour (Low, Seetharaman and Poon, 2001). Similarly, Tam and Tan (2007) shows that different ownership types exhibit distinct mannerisms of preferences for corporate governance practices in the invasive concentration of shareholding that will impact on firm performance.

Separation of ownership and control in the modern diffused ownership corporations are intimately associated with the general problem of agency (Jensen and Meckling, 1976), subsequently, the advocating of CG has become the limelight for directors and managers to maximise shareholders' wealth. CG is the system by which companies are directed and controlled, and boards of directors are made responsible for the governance of their companies (United Kingdom Shareholders' Association, 1992). Despite the practice of CG into many public listed companies, the recent worldwide accounting scandals, have underscored the role of CG in protecting the interest of investors; however, the growing awareness of CG has also made it more difficult to define good governance (Marisettey and Vedpuriswar, 2003).

Deficiencies in corporate governance among companies in Malaysia are also thought to be linked to the Board Structure of company. Many companies with large shareholders exercise control rights where the risk of the minority shareholders is being expropriated. There is also general scepticism about the ability of boards and in particular, independent of non-executives to monitor management by controlling shareholders. Control rights secured by the largest shareholder, are often disproportionately greater than actual ownership holdings.

There are many aspects where the shareholders can look into a company before, during and after their investment decision. Therefore, companies will need to practice sound corporate governance in order to gain public confidence. As such, fuzzy logic (FL) may be utilized as a tool to enhance the corporate governance ratings among the industry, to justify whether good corporate governance is being practiced and enhanced even though there is no proper statutory control over certain areas. In this paper, two major factors, namely financial transparency and disclosure and board structure

are examined.

LITERATURE REVIEW

Financial transparency and disclosure (FTD)

Transparency and information disclosures are keys to effective shareholder control and protection. Information about a company usually includes financial results of the company, major share ownership, the members of the board of directors and key executives and their remuneration, foreseeable major risk factors, governance structures, and company objectives and policies. Malaysia has been adopting, starting from the late 1970s, and the accounting standards that are generally consistent with those issued by the International Accounting Standards Committee (IASC). The approved accounting standards, Malaysian Accounting Standards (MAS), cover issues not dealt with by the IASC and reflect particular features of the Malaysian business environment. The Research Institute of Investment Analysis in Malaysia (RIIAM) was established in 1985 by the Kuala Lumpur Stock Exchange (KLSE) (known as Bursa Malaysia now) to enhance the level of investment analysis, research and professionalism in the Malaysian securities industry.

There are several major areas that may affect the elements of financial transparency (Kulzick, 2004), including accounting standard and oversight (disclosure related to all off-balance sheet transactions and other relationships with unconsolidated entities must be disclosed), reporting timing standards (all material changes in financial condition or operations must be reported in a rapid manner, referred to real time disclosure), responsibility standard (audit committee of the board is responsible for appointment, compensation, and oversight of the public accounting firm performing the audit), and document standard (audit work papers must be maintained for five years—section 108).

Financial transparency involves at least eight related concepts (Kulzick, 2004) such as accuracy (information follows the standards), consistency (consistently of the standard application), appropriateness (standard use clearly re-elected the underlying economic reality of the organization), completeness (all information needed by the user should be available), clarity (information present should be clear and understand to user), timeliness (information should be presented within a reasonable time after it is known), convenience (easy accessible information) and governance (adequate policies in place).

Board structure (BS)

Sound corporate governance should also include the strategic guidance of the company, the effective monitoring

Table 1. Profile of audit committee members in Malaysia.

Representation	Majority (%)	About half (%)	Minority (%)	None (%)	No answer (%)
Financial professionals	20	17	37	21	5
Legal professionals	6	8	23	52	11
Retired Industry Leaders	7	6	17	61	9
Retired Senior Government Officials	9	6	32	45	8

monitoring of management by the board, and the board's accountability to the company and the shareholders. The board should fulfil certain key functions, including (i) Reviewing and guiding corporate strategy, major plans of action, risk policy, annual budgets and business plans; (ii) Selecting, compensating, monitoring and when necessary, replacing key executives and overseeing succession planning; (iii) Reviewing key executive and board remuneration, ensuring a formal and transparent board nomination process; and (iv) Monitoring the effectiveness of the governance practices under which it operates and making changes as needed.

Board of directors monitor managers and control companies on behalf of all shareholders. Boards are expected to formulate corporate policy, approve strategic plans, authorize major transactions, declare dividends, and authorize the sale of additional securities (MCCG, 2010). They are also expected to hire, advise, compensate and, if necessary, remove management, arrange for succession, and determine the size of boards and nominate new members, subject to approval by shareholders (MICG, 2010). The effectiveness of board of directors in monitoring managers and exercising control on behalf of shareholders depends on a number of factors. A widely held view is that: (i) the representation of independent or non-executive directors on boards, (ii) independent board committees for remuneration, nomination and auditing, and (iii) splitting the role of the chief executive officer (CEO) from that of chairman of the board.

Independent and non-executive director

In Malaysia, a study of 92 PLCs at the main board of KLSE shows that 48% of them have executive chairmen on their boards while only 23% have non-executive chairmen (Kuala Lumpur Stock Exchange, 1999). An analysis of large PLCs reveals that only a few of the companies have non-executive directors as chairmen of boards, while some chairmen are appointed by the government. In PricewaterhouseCoopers (2002), the results from the KLSE/PricewaterhouseCoopers corporate governance survey indicate a reasonably proportionate mix of independent non-executive directors, non-executive directors and executive directors. Almost all (90%) of companies have at least in name, 2 independent directors of which

half (49%) have 2 independent directors and nearly a quarter (23%) have 3 independent non-executive directors. This is in line with the Listing Requirement (LR) of the Bursa Malaysia (formerly known as KLSE) which was launched on the 22 January 2001 stipulated that PLCs will be required to ensure a minimum number of independent directors [that is at least 2 directors or 1/3 of the board of directors of a listed issuer, whichever is higher must be independent].

On the other hand, Raghunandan et al. (2001) revealed that when the audit committee's comprise sole independent directors, there are information asymmetries between the independent directors and management, and in turn internal auditing assumes a valuable resource for audit committees to gain appropriate information. Therefore, the audit committee's composition and interaction with internal auditors as critical factors affecting audit committee effectiveness. In fact, Malaysia regulators specifically stipulate that the Chair of the Audit Committee be a qualified accountant (Wallace and Zinkin, 2005).

Audit and remuneration committees

Under the LR, all PLCs must have audit committees comprising 3 members of whom a majority shall be independent. The profile of audit committee members surveyed by the KLSE/PricewaterhouseCoopers is detailed in Table 1. Some PLCs have the internal audit function even though this is not a mandatory. In this survey, about 68% of the PLCs of the respondents have internal audit functions and 33% out of those have outsourced the audit function.

The Code of Corporate Governance has set out an additional function for the audit committee, which is to consider and investigate any matter that raises questions about management integrity, possible conflicts of interest or abuses by a significant or controlling shareholder. The Code further recommends that if the board fails to take any action on the findings of the audit committee, the directors of the audit committee should be required under the listing rules of the Bursa Malaysia to report the matter directly to the Bursa Malaysia, in which Bursa Malaysia has established the Taskforce on Internal Controls with the objectives to formulate and issue the guidance in

assisting PLCs to report the state of their internal control in their annual reports.

The remuneration committee whose members comprise mainly non-executive directors is a relatively new concept in Malaysia. One out of five PLCs already has remuneration committees in Malaysia. However, no data is provided on the membership of these committees. The Malaysian Code on Corporate Governance stresses that the membership of the remuneration committee should be disclosed in the director's report and the details of remuneration of each director should be disclosed in the company annual report (MICG 2010).

Executive compensation

The compensation of executives plays a central role in corporate governance in aligning the interests of managers and shareholders. The exact form of the optimal incentive package depends on the specific details of the agency problem but often involves performance-related pay and the award of the stock options to managers. In Malaysia, the country study found that board chairmen and the CEOs are mostly paid by fixed salary (Thillainathan, 1999).

Bushman et al. (2004) suggested four aspects of board structure such as the percentage of directors who are insiders (officers); board size (measured as the total number of directors on the board); outside director industry expertise and average number of other boards on which outside directors' serve. The apparent premise underlying the movement toward greater outside director representation is that more outside directors will lead to better decisions by the board and 62.3% of all the KLSE listed companies had at least three outside directors in 1998 (Dahya and McConnell, 2005). In the context of corporate governance, board of directors is crucial to shelter shareholders' interest in wealth maximization. Since, the research has shown that majority of the listed companies KLSE has at least 3 outside directors; the level of good corporate governance in board structure would be increased to the higher level.

The responsibilities of the Chair and the CEO need to be kept distinct. CEOs who also serve as chairperson of the board are expected to evaluate their own performance, and obviously creates potential for conflict of interest. CEO is the professional manager and cannot represent the shareholders and impartially sit in judgment of him (Wallace and Zinkin, 2005). Activist group favours an independent structure whereby different individuals hold the positions of CEO and chairman (Brancato, 1997; Bryne, 2000). There is some empirical evidence that duality is associated with lower performance (Rechner and Dalton, 1991). To see the impact of CEO duality to the issue of whether CEO duality matters, Rhoades et al. (2001) have examined the relationship between board

leadership structure and organizational financial performance, using meta-analytic technique of 22 independent samples across 5,751 companies. Results reveal that board leadership matters, and independent leadership board structure has a significant influence on firm performance.

METHODOLOGY

Fuzzy logic (FL) corporate governance design

FL has been extensively applied in engineering and science fields; especially in the application of FL in breast cancer diagnosis (Kovalerchuk et al., 1997). In business arena, the typical business valuation has a significant limitation: the failure to recognise uncertainty; fortunately, 'fuzzy math' functions in spreadsheets can formally incorporate significant additional information into valuation reports and help mitigate the limitations of the traditional valuation approach (McKee, 2004). Thus, FL could be an effective tool to solve many elusiveness problems in CGR. Besides, the concept of fuzzy set theory can be very useful as it allows decisions to be made in a programmed form because fuzzy number can be included on a spreadsheet model (Gutierrez, 1989).

Corporations are analysed on the basis of director independence, director stock ownership, director quality and board activism; these assessments result in a list of the 'best' or 'worse' boards (Daily and Dalton, 2004). However, the word 'best' and 'worse' in ranking corporate would then become 'vague' to determine the object precisely of how 'good' or how 'bad'. FL is developed to deal with the uncertainty that arises from ambiguity or vagueness, which occurs because of the inability to measure an object precisely (McKee, 2004). Therefore, incorporating FL into CG, the different degree of CGR can be justified through the fuzzy design.

Fuzzy corporate governance

$$x = \{(\rho, \mu_x(\rho))\}, \rho \in \rho \quad (1)$$

$$\mu_x(\rho) : \rho \rightarrow [0,1] \quad (2)$$

$$x = \{(\mu_x(\rho_1) / \rho_1) + (\mu_x(\rho_2) / \rho_2) \dots \dots \dots \{(\mu_x(\rho_n) / \rho_n)\} \quad (3)$$

$$x = \sum_{\rho \in \rho} \mu_x(\rho_i) / \rho_i \quad (4)$$

ρ denotes FTD; θ denotes BS; and η is CGR. ρ is the element of disclosure in the universe of ρ in the fuzzy set x in Equation (1). It has an interval [0,1] including infinite degrees from 0 to 1 in Equation (2). The relationship between fuzzy set and crisp value can be explained in Equation (3), where $\mu_x(\rho_i)$ is the degree of membership for corresponding crisp value ρ^1 . The summation as shown in Equation (4) denotes a combination of all different degrees of membership for corresponding crisp values.

$$\mu_x(\rho) = \begin{cases} \rho_i' \leq \rho_i'' \leq \rho_i & \frac{a'}{\rho_i - \rho_i'} (\rho_i'' - \rho_i') & (5) \\ \rho_i \leq \rho_i \sim \leq \rho_i \sim \sim & \frac{a'}{\rho_i \sim \sim - \rho_i} (\rho_i \sim \sim - \rho_i \sim) & (6) \end{cases}$$

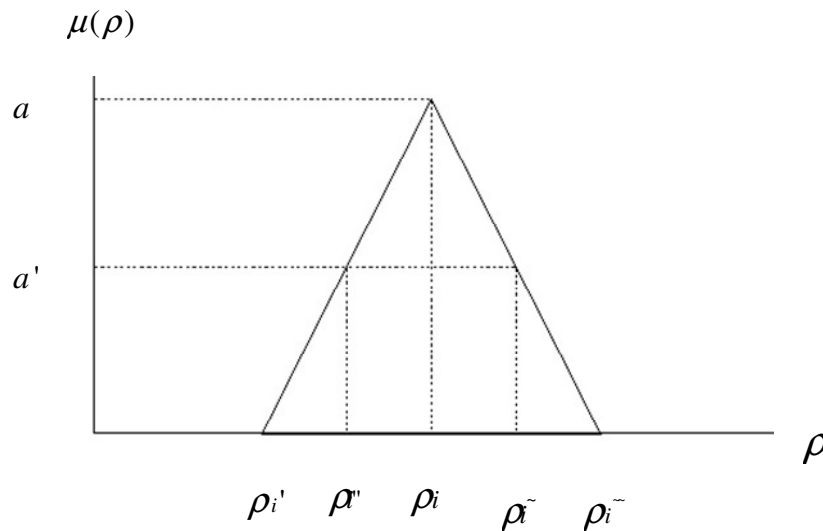


Figure 1. Fuzzy FTD.

From Equation (2), the membership degree has infinite values from 0 to 1. Triangular shape of membership functions is used as depicted in Figure 1. For any given input, crisp value within the boundary between ρ_i' and ρ_i , the degree of membership could be obtained from Equation (5) with appropriate substitution. The same explanation is applied to Equation (6).

The two input variables θ and ρ would affect the crisp output value η . Each variable that would associate with fuzzy set is represented in difference shapes and levels. As for η , fuzzy set is represented by different levels of CG such as 'Very Good' (VG), 'Good' (G), 'Average' (A), 'Poor' (P) and 'Very Poor' (VP) as shown in Figure 2. The Membership functions have infinite interval from 0 to 1. The crisp value of individual variable could range from 1 to 10. The degree of how good the corporate governance would be associated with the crisp output from 1 to 10. Higher score shows the company with higher degree of good corporate governance practice. In the real world, the objective of the decision makers is fuzzy in nature and fuzzy logic could be a vital tool (Jana and Chattopadhyay, 2004) to obtain pleasurable explanation for CGR.

Fuzzy inference (FI)

Before drawing the final crisp value of CGR, Fuzzy Inference (FI) is a process to implicate two input variables. The outcome of FI would be still in linguistic value for CGR. When ρ and θ are in different levels, η will be determined in linguistic value. Since there will be 5 linguistic terms for ρ and θ , there will be 25 rules as shown in Table 2. 'If and Then' condition, of each rule in the rule base indicates how adequately each rule describes the current situation (National Instrument Manual, 2001).

- If ρ is high, and θ is good then η is good (a)
- If ρ is low, and θ is average then η is bad (b)
- If ρ is very high, and θ is bad then η is bad (c)

Some of rules based stated in (a) to (c) and Table 2: If ρ is very high, and θ is bad then η is 'Poor', this is the linguistic value. The range of output variable is assigned between 1 and 10; with high value determine good CGR.

$$C_{\rho, \theta} = \max\{\min[VL_{\rho}(\rho), G_{\theta}(\theta), A_{\eta}(\eta)], \min[VL_{\rho}(\rho), G_{\theta}(\theta), A_{\eta}(\eta)], \min[L_{\rho}(\rho), G_{\theta}(\theta), A_{\eta}(\eta)], \min[L_{\rho}(\rho), G_{\theta}(\theta), G_{\eta}(\eta)]\} \quad (7)$$

CGR has five membership functions such as 'VG', 'G', 'A', 'P' and 'VP'. VL_{ρ} denotes that the FTD has a value on very low membership and G_{θ} implies BS has a degree on good membership. After setting the rule base for CGR, de-fuzzification would require mathematic computation. Given conclusion (c) obtained by the individual fuzzy inference rules, the overall conclusion is obtained by taking the union of all the individual conclusions (Klir, Clair and Yuan, 1997). The result obtained from Equation (7) will be a linguistic value, which would require mathematical computation to obtain the final crisp value.

η' and η'' would be the central point of individual linguistic term, where η' would be the central point of M and η'' would be the central point of G. In other words, η' and η'' would be the linguistic value of the linguistic terms 'Medium' (M) and 'Average' (A) and with the degree of membership ϑ (Ramly, 1996).

$$\text{Corporate governance rating, CGR} = \frac{\eta' \cdot x(\vartheta) + \eta'' \cdot x(\vartheta)}{\vartheta + \vartheta} \quad (8)$$

The purpose of de-fuzzification is to convert the fuzzy set representing the overall conclusion Klir et al. (1997) obtained in Equation (8) into a true figure that concludes the value for the area under the Figure 3 of the membership function. "Center of Maximum" (National Instrument Manual, 2001) is one of the de-fuzzification methods used to calculate the best compromise with a weighted average of typical value of the terms, which can be expressed in Equation (8).

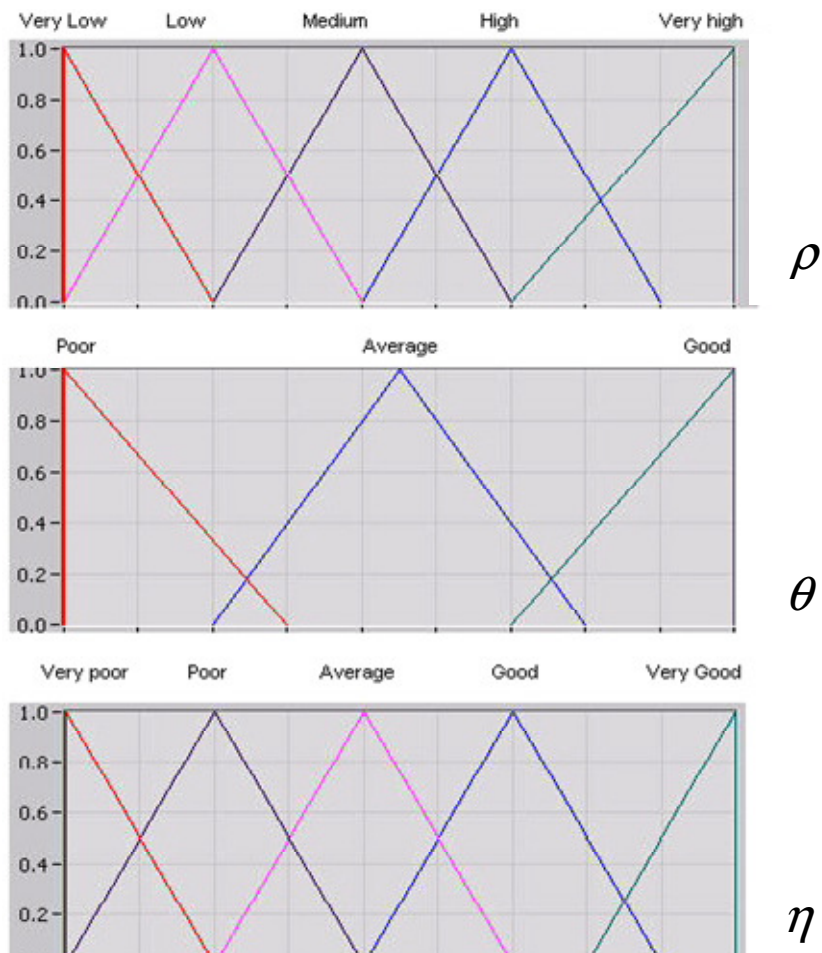


Figure 2. Membership function with variables.

Table 2. 25 Matrix rules inference for fuzzy corporate governance rating.

		ρ				
		VL_{ρ}	L_{ρ}	M_{ρ}	H_{ρ}	VH_{ρ}
θ	η	VP_{η}	VP_{η}	P_{η}	P_{η}	P_{η}
	A_{θ}	P_{η}	P_{η}	A_{η}	A_{η}	G_{η}
	G_{θ}	P_{η}	A_{η}	A_{η}	G_{η}	VG_{η}

Illustration

A number of tests on CGR have been done by applying NI LabView Visual instrument tool. LabView and FL controller design toolkit are utilised to perform the entire fuzzification, inference and de-fuzzification processes. The data analysis and presentation is performed using powerful graphical user-friendly software, which is widely used in engineering and science disciplines.

From the extant literature review, ten sub-variables in Financial Transparency and Disclosure (FTD) and Board Structure (BS) respectively are identified and these are the most vital factors in a corporate that is of interest to the shareholders. These factors

would be cross-examined and ranked from 1–10. Higher score shows the company with higher degree of good corporate governance practice.

RESULTS

In the analysis, the Ten sub-variables in FTD as indicated by ρ are - share ownership, financial performance (profit/loss), corporate governance structures and policies, total remuneration, financial leverage, employees

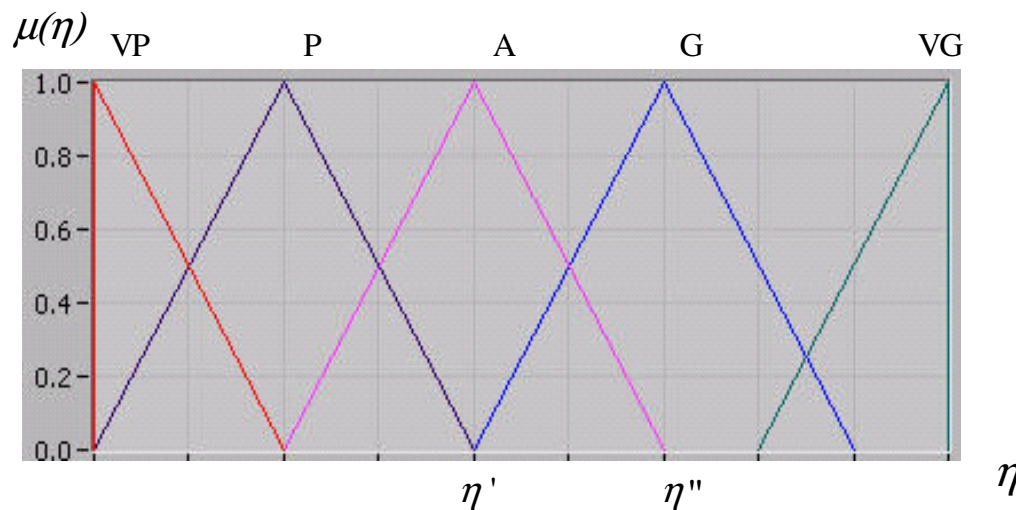


Figure 3. CGR De-fuzzification.

Companies	ρ	θ	η
A	3.5	7.6	4
B	8.25	3.5	5
C	8.25	7.6	7.4

benefit and other stakeholders issues, company targets and prospects, transparency, disclosure of information and audit, extraordinary transactions, transactions on derivative products and their level of risk, and Non-Performing Loan (NPL). Meanwhile, ten sub-variables in BS as indicated by θ are - composition of non-executive director (%), audit remuneration committee, executive compensation, Chief Executive Officer (CEO) turnover, the percentage of insider officer, board size, outside director expertise, CEO duality, internal administrative structure, and independent board of monitoring.

The sample tests of cross-relationship between FTD and BS are shown in Table 3. For instance, Company A shows a score of 3.5 in FTD and a score of 7.6 in BS. The total overall rating is 4. Company B shows a score of 8.25 in FTD and a score of 3.5 in BS and the overall rating is 5. Company C show a score of 8.25 in FTD and 7.6 in BS and the overall rating is 7.4. It is obvious that even though Company A has gained better weightage in BS, it does not show a good performance in FTD. Therefore, the overall rating remains slightly lower. The improvement program on low rating company can then be recommended to improve their CGR and to enhance shareholders' confident in their corporate governance practice.

A generic and comprehensive program has been designed to accommodate the required to determine the

good corporate government rating. The results of three-dimensional (3D) surface plot representation of FTD (i.e. as a single output) versus BS and CGR are obtained and depicts in Figure 4. Representation of 3D surface plot is useful. It shows the dependency of two inputs variable and the output variable, with clear visibility for investors considering the CGR. The results reveal how individual variable will affect the crisp output value. A combination of high FTD value and a large BS value, when input into this particular fuzzy logic design, will result and display peaks in this graphical output.

Conclusion

Any corporate governance system will be the result of the interplay of political, economic, legal, cultural and historical factors. To entrench a sound corporate governance principle and good practices, stringent legislation and regulation alone is not sufficient. It has to be the combination of a strong culture of ethics, honesty and good sense, based on the principles of trust, transparency, accountability and fairness. Good corporate governance is essential in setting up a sound framework for a vibrant market economy for enhancement of the investors' confidence and attracts the flow of capital into the industries. This paper discusses how fuzzy logic can be a useful tool in solving the 'ambiguous' scenario in

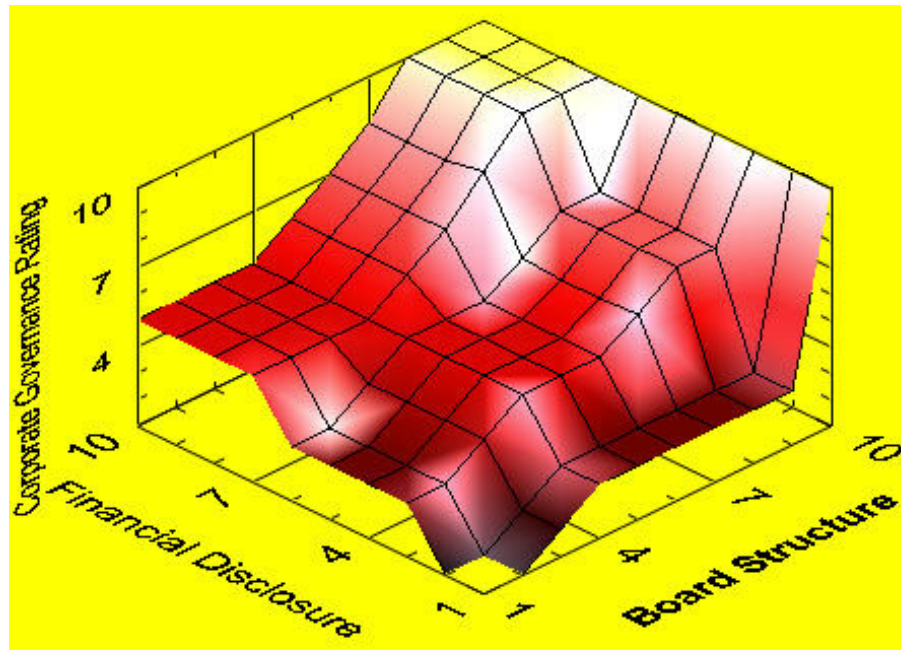


Figure 4. Surface plots of the dependency of the FTD, BS and the output variable CGR.

the 'ambiguous' scenario in corporate governance rating. Here, two important variables such as financial transparency and disclosure, and board structure have been integrated to get a plausible rate for the corporate governance rating.

Fuzzy logic rating process might require a comprehensive system to enter input variable and obtain the best figure for the rating, which might be time-consuming initially. After the system has been created, the rate can be automated through the system program. The corporate will not only be benefited from knowing the rate of their corporate governance, an improvement program could also be suggested if the corporate has a low rating in certain variable. It can be used to enhance and modernise the existing foundation on which the existing corporate governance framework is premised. There is a need to call for a rationalised regime for prospectus regulation, the introduction of civil actions for insufficient disclosures, additional reporting by directors on the state of internal controls and going concern status of a company.

Good corporate governance is essential in setting up a sound framework for a vibrant market economy because it will enhance the investors' confidence and attract the flow of capital into our industries. More importantly, there are global forces pushing for better corporate governance standards all over the world. If Malaysia wishes to be part of the global capital market, we have to further enhance the corporate governance in Malaysia and bring its standard to the greatest height (Malaysia Code on Corporate Governance, 2010).

REFERENCES

- Brancato CK (1997). *Institutional Investors and Corporate Governance: Best Practices for Increasing Corporate Value*. Chicago: Irwin Professional Publishing.
- Bushman R, Chen Q, Smith A (2004). "Financial Accounting Information, Organizational Complexity and Corporate Governance." *J. Account. Econ.*, 37: 167-201.
- Byrne JA (2000). "The Best and Worst Corporate Boards." *Bus. Week.*, 24: 142-152.
- Dahya J, McConnell JJ (2005). "Outside Directors and Corporate Board Decision." *J. Corp. Financ.*, 11(1-2): 37-60.
- Daily CM, Dalton D (2004). "The Ratings Game." *J. Bus. Strat.*, 25(1): 7-8.
- Demirag I, Wright M, Sundarsanam S (2000). "Corporate Governance: Overview and Research Design." *Br. Account. Rev.*, 32: 341-354.
- Drake DS (2003). "Are You Ready for the Rating Game? The Corporate Governance Rating Phenomenon (Governance ratings): Corporate Governance Advisor," Aspen Publishers Inc., 2003. <http://www.georgesonshareholder.com/pdf/ratingsgame.pdf>.
- Easterbrook FH, Fischel DR (1991). *The Economic Structure of Corporate Law*. Massachusetts: Harvard University Press.
- Gutierrez I (1989) "Fuzzy Numbers and Net Present Value." *Scand. J. Manage.*, 5(2):149-159.
- Jana C, Chattopadhyay RN (2004). "Block Level Energy Planning for Domestic Lighting – a Multi-Objective Fuzzy Linear Programming Approach." *Energy*, 29(11): 1819-1829.
- Jensen MC, Meckling W (1976). "Theory of the Firm: managerial behavior, agency costs and ownership structure." *J. Financ. Econ.*, 3(4): 305-360.
- Klir GJ, Clair UH, Yuan B (1997). *Fuzzy Set Theory: Foundations and Applications*, NJ: Prentice Hall PTR, ISBN: 978-0133410587.
- Kovalerchuk B, Triantaphyllou E, Ruiz J, Clayton J (1997). "Fuzzy Logic in Computer-Aided Breast Cancer Diagnosis: Analysis of Lobulation." *Artif. Intel. Med.*, 11(1): 75-85.
- Kuala Lumpur Stock Exchange (1999). *Companies to Promote Corporate Governance*. 1999. <http://www.klse.com.my> (accessed June 16, 2005).

- Kulzick RS (2004). "Sarbanes-Oxley: Effects on Financial Transparency." *Adv. Manage. J.*, 69(1): 43-49.
- Low LT, Seetharaman A, Poon WC (2001) "What Do Institutional Investors Want? Evidence from Malaysia." *Corp. Gov. Int.*, 4(4), pp 23-35.
- Malaysia Code On Corporate Governance (2010) - www.ecgi.org/codes/documents/mccg_mar2000.pdf
- Malaysia Institute of Corporate Governance (2010) – www.micg.net
- Marisetty VB, Vedpuriswar AV (2003). *Corporate Governance and Market Reactions*. May, National Stock Exchange of India Limited Grant.
- McKee TE (2004). "A New Approach to Uncertainty in Business Valuations." *The CPA J.*, 74(4): 46-49.
- National Instrument Manual (2001). *PID Control Toolset Manual*. National Instrument Corporation.
- Organization for Economics and Co-operation and Development (OECD) (2006). *OECD Principles of Corporate Governance*. 2004. <http://www.oecd.org/dataoecd/32/18/31557724.pdf>, (accessed June 18, 2006).
- PricewaterhouseCoopers (2002). *The KLSE-PwC Corporate Governance Survey 2002, 2002*. <http://www.pwcglobal.com>, (accessed January 25, 2005).
- Raghunandan K, Read WJ, Rama DV (2001). "Audit Committee Composition, "Gray Directors", and Interaction with Internal Auditing." *Account. Horiz.*, 15(2):105-118.
- Ramly bin HA (1996). *Corporate Governance in Malaysia for Vision 2020: Issues and Expectations*. 1996. <http://members.tripod.com/companylaw/governance.html>, (accessed August 21, 2005).
- Rechner PL, Dalton DR (1991). "CEO Duality and Organizational Performance: A Longitudinal Analysis." *Strat. Manage. J.*, 12(2): 155-160.
- Rhoades DL, Rechner PL, Sundaramurthy C (2001). "A Meta-analysis of Board Leadership Structure and Financial Performance: Are "Two Heads Better Than One?" *Corporate Governance: Int. Rev.*, 9(4):311-319.
- Singh M, Davidson III WN (2003). "Agency Costs, Ownership Structure and Corporate Governance Mechanisms." *J. Bank. Financ.*, 27(5): 793-816.
- Tam OK, Tan GSM (2007). "Ownership, Governance and Firm Performance in Malaysia," *Corporate Governance: Int. Rev.*, 15(2): 208-222.
- Thillainathan R (1999) "Corporate Governance and Restructuring in Malaysia – A Review of Markets, Mechanisms, Agents and the Legal Infrastructure," *Joint World Bank/OECD Survey of Corporate Governance Arrangements in a selected number of Asian countries*.
- United Kingdom Shareholders' Association (1992). *The Financial Aspects of Corporate Governance (The 'Cadbury' report)*, Financial Reporting Council, United Kingdom, 1992. http://www.ecgi.de/codes/country_document/UK/cadbury, (accessed April 1, 2007).
- Wallace P, Zinkin J (2005). *Mastering Business in Asia: Corporate Governance*. Singapore: John Wiley and Sons (Asia) Pty Ltd.