ANALYSIS OF CORPORATE GOVERNANCE AND RELATIVE EFFICIENCY OF PUBLIC COMPANIES LISTED IN INDONESIAN STOCK EXCHANGE

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ABSTRACT

This research aims to investigate the relationship between corporate governance and company's relative efficiency. The research sample is 34 public companies listed in Indonesian Stock Exchange. A modified Jones (1991) model is used to detect the earnings management practice as a proxy to corporate governance. In regard with the efficiency score, this research employs Data Envelopment Analysis (DEA). This research find that the there is no significant relationship between corporate governance and its efficiency

Keywords: corporate governance, data envelopment analysis, earnings management, Indonesian stock exchange.

INTRODUCTION

Corporate governance has become a popular research area and has been discussed internationally up until now. It comes up to the public and results with the awareness that pushed standard setters in many countries to develop and reform the corporate governance practices (Solomon, 2007). Against the background of well-known bankruptcies of corporations, e.g. Maxwell Group, Enron, WorldCom, Parmalat, and other corporate; the financial scandals and failure of those big companies across countries had highlighted a weak corporate governance (Solomon, J., 2007, p.1; Zelenyuk, V., Zheka, V., 2004; Ehsan H. Feroz, Sanjay Goel, Raymond L. Raab., 2006). At the time when economic crisis had attacked in 1997-1998, world became insufficient of transparency and accountability. A possible reason might be also due to poor corporate governance and even or maybe, no application of corporate governance (Nam and Nam, 2005). Looking from Asian financial crisis perspectives, Indonesia is the one country who is left behind from economic recovery compared to other Asian

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countries (FCGI, 2006). The need to improve corporate governance to the international level is a challenge and highly recommended (Solomon, 2007). In Asia, corporate governance practices have become the important element of economic recovery model in overcoming economic crisis (FCGI, 2006).

According from previous studies, Klein (2002) posits that corporate governance characteristics are related to earnings management. Therefore, earnings management and poor corporate governance mechanism are positively related. Other researchers (Huson et al., 2001; Denis and McConnell, 2003; Brown and. Caylor, 2004; Chtourou, Bedard, and Courteau, 2001; Xie, Davidson III, and DaDalt, 2001) believe that governance mechanisms include board characteristics, outside supervision and executive compensation, audit committee. Furthermore, Bruner (2004) argue that corporate governance of a firm should be a telltale for firm's efficiency. Based on Cooper, Seiford, and Tone, K. (2006) and Manzoni (2007), efficiency is defined as the benefits realized and resources used.

There have been many studies analyzing the relationship between the earning management practices as a proxy to corporate governance and the company market performance. This study is aimed to investigate whether corporate governance also contributes to company's efficiencies.

LITERATURE REVIEW

Corporate Governance

"Governance" is the action of controlling or directing. In a corporate setting, governance entails a system of oversight and delegation of decisions that reaches from the owners of the firm (the shareholders) to the board of directors, and from there to senior, middle, and front-line managers (Bruner, 2004). In April 1999, Organization for Economic Cooperation and Development (OECD) defines corporate governance as the following.

> *"Corporate governance is a system by which business corporations are directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among different participants in the corporation, such as, the board, managers, shareholders and other stakeholders, and spells out the rules and procedures for making decisions on corporate affairs. By doing this, it also provides the structure through which the company objectives are set, and the means of attaining those objectives and monitoring performance." (cited in Encycogov, n.d).*

The main principles of Corporate Governance are required to guide achieving and enable maintaining sustainability beyond Corporations' interests, especially shareholders. According to NCCG (2006) of Indonesia, the five principles of GCG include Transparency, Accountability, Responsibility, Independency, and Fairness.

The implementation of GCG is required to be supported with three pillars (NCCG, 2006). They are:

1. The Government of Indonesia must construct rules and regulations that enhance a sustainable, efficient, and transparent business; and must implement consistent law enforcement;
2. A business environment must encompass and implement GCG as its business principle to enhance a sustainable, efficient, and transparent business;
3. A society must express a duty of care and commit a social control toward an object produced by a business in accordance with objective and accountable opinion.

Based on Klein (2002), corporate governance characteristics are related to earnings management. She employs modified Jones model and uses discretionary portion of total accruals to capture earnings management. However, since discretionary accruals may be positive or negative, she uses the absolute value of discretionary accruals in the study. The sample consists of 687 large, publicly-traded U.S. firms with the assertion of better, more independent, corporate governance structures produces less earnings managements by management. It proves that the view of board characteristics geared towards producing a more independent and active corporate governance environment results in less earnings management. Many prior studies also believed with her findings, such as Baysinger and Butler (1985); Bhagat and Black (2002); Byrd and Hickman (1992); and Chtourou, S. M., Bedard, J., and Courteau, L. (2001); (Petra, S. T., 2006). Overall, earnings management and poor corporate governance mechanisms are positively related (Klein, 2002).

Healy and Wahlen (1999) describe earnings management as follows:

> *"Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers"*.

Analysis of earnings management often focuses on management's use discretionary accruals. The discretionary portion of total accruals is the appropriate measure to capture earnings management (Klein, 2002; Bergstresser and Philippon, 2006), because total accruals should capture a larger portion of managers' manipulations (McNichols and Wilson, 1988). In addition, Dechow, Sloan, and Sweeney (1995) proposed that a modified version of the model developed by Jones (1991) is the most powerful tests for detecting earnings management.

According to Klein (2002), corporate boards are at the heart of corporate governance as shareholders have delegated authority to the board to oversee and control decisions made by upper management (Fama and Jensen, 1983). Boards of directors are responsible for monitoring the integrity of firm's financial statements. A firm's board of directors can be structured in many different ways so as to meet the needs of the

organization (Petra, S. T., 2006). Cited in Bruner (2003, p.704), Michael Jensen argued that the problem with internal corporate governance system start with the board of directors. The board has the final responsibility for the functioning the firm. The job of board is to hire, fire, and compensate the CEO, and to provide high-level counsel. Importantly, it is to provide an early warning system to put the organization back on track before difficulties reach a crisis stage. These corporate governance characteristics involve the proportion of outside directors, CEO duality, and board's compensation committee.

In contrast with study of Klein (2002), Sulistyono and Wibisono (2003) explore whether GCG can be implemented by the companies listed in Jakarta Stock Exchange. They employed modified Jones (1991) model due to powerful test of detecting earnings management and uses discretionary accruals to capture earnings management. The sample used is 24 IDX companies for 5 years. Year 1996 and 1997 are the periods before implementing GCG practices, year 1998 is the period of GCG implementation emerging, and year 1999-2000 are the obligation period of GCG implementation. As a result, they find that earnings management before and after implementing GCG practices has insignificant differences.

Company's Efficiency

The measurement of company's relative efficiency for this research employs Data Envelopment Analysis (DEA) model; based on Cooper, Seiford, and Tone (2007). Banker, Charnes, and Cooper (1984) argued the concept of DEA that DEA constructs an efficient frontier composed of those firms that consume as little input as possible while maximizing as much output as possible. Those firms that reach the efficient frontier are efficient, while those firms below the efficient frontier are inefficient. Weights that give the best ratio score of 1 (100%) is efficient, whereas the weights that give the score of 0 and less than 1 is inefficient (Cooper et al, 2007).

Furthermore, Zheka (2005) summarizes the three advantages of applying DEA to corporate governance context. First, the DEA is a nonparametric approach and does not impose any specific assumption of production functional form. Second, DEA focuses on the individual observations rather than on population average, compared with the regression analysis. Third, it compares firm performance to the revealed best-practice frontier, rather than on the central-tendency properties of the frontier.

DEA that measures relativity of efficiency within the data applies two orientations. Manzoni (2007) measures input orientation when the levels of outputs are maintained and gains are achieved by trying to minimize inputs while operating in the same environment. In contrast, output orientation occurred when levels of inputs are maintained and gains are achieved by trying to maximize outputs while operating in the same environment. Since all companies consume resources (incur costs) in order to generate revenues and they are the objective measure of the firm's operations; thus the output variable employed is sales revenues. The input variables measured are selling and general administrative expense and cost of sales. These costs include labor,

material, energy, and other costs. They explain firm efficiency because of the benefits of increasing revenues yet they will bear many of the costs of a firm. Second is capital (net working capital and fixed assets). A gain in output might result from an increase in capital (Cooper et al, 2007).
Overall, the revenues and costs incorporate such important economic information as prices. Revenues are maximized, while efficiently minimizing expenses and resources (Zheka, 2005). All these variables are considered to reflect the portion of each sales of dollar needed to meet the efficiency of a company, which is the ratio of the output goods and services to input resources, which showed the ability to maximize output from a given input (Manzoni, 2007).

HYPOTHESIS DEVELOPMENT

Klein (2002) stated that corporate governance characteristics are related to earnings management. In addition, earnings management and poor corporate governance mechanism are positively related. She employs modified Jones model and uses discretionary portion of total accruals to capture earnings management. Since discretionary accruals may be positive or negative, he uses the absolute value of discretionary accruals in the study. Hence, the absolute value of discretionary portion of total accruals that illustrates earnings management is used in this research to capture corporate governance.
However, Sulistyanto and Wibisono (2003) found that earnings management before and after implementing GCG practices in Indonesia has insignificant differences in terms of corporate governance. Bruner, R. F. (2004 p.79), however, suggested that corporate governance of a firm should be a telltale for firm's efficiency. According to the above justification, the testable hypothesis of this study is that corporate governance is correlated to the company's efficiency.

DATA AND RESEARCH METHODOLOGY

Data

The sample is randomly selected and using samples of firm-year 2008. The sample will be randomly selected, taking into account the availability of data, the published financial statements for year ended 2008. The sampling design of this study is purposive sampling due to selective criteria as follows:

a. A sample of 35 companies is subject to be listed in the Indonesian Stock Exchange (IDX) in the years observed by the research, which are during period 2008.
b. A sample of 35 companies should have a complete set of financial reports and variables used in the research during period 2008.

c. The author excluded 1 company, which is PT Astra International Tbk, due to outlier's data.

These selective criteria have brought the total sample into 34 public listed companies; as shown in Appendix 1.

Research Methodology

The aim of this research is to investigate whether corporate governance is correlated to company's relative efficiency, focused on Indonesian public listed companies in year 2008. There are several stages conducted in this research. First, measuring the earnings management involves determining total accruals of Jones (1991) model and computing nondiscretionary accruals of Modified Jones Model (Dechow, Sloan, and Sweeney, 1995). The difference between those two data will result in discretionary portion of total accruals. Since discretionary accruals may be positive or negative, the absolute value of discretionary accruals will be employed in this study. Klein (2002) stated that corporate governance characteristics are related to earnings management. Hence, the absolute value of discretionary portion of total accruals that illustrates earnings management is used to capture corporate governance.

Second, based on Cooper et al(2007), DEA-Solver model of software program is used to calculate the efficiency scores. The model used is CCR-O, called Output-oriented of Charnes-Cooper-Rhodes model. Following previous research studies of Lin, Ma, and Su (2008), two inputs and one output are employed in the efficiency analysis. The input variables are costs (COGS and SGA) and capital (working capital and fixed assets). They explain firm efficiency because of the benefits of increasing revenues yet they will bear many of the costs of a firm. Output variable is sales revenues, since a company consumes resources (incur costs) in order to generate revenues and they are the objective measure of the firm's operations.

Finally, the degree of association between those two variables is measured using nonparametric Spearman rank correlation coefficient.

FINDINSGS AND DISCUSSIONS

Descriptive Statistics

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Asset (bill Rp)	35	44.19	39.594	3.829	8.158
ACCR (bill Rp)	35	(420)	2.458	147	531
Absolute Value	35	0.0010	0.2542	0.0829	0.0581
Score	35	0.0718	1.0000	0.1829	0.2166

As is total assets in year τ;

ACCR is income before extraordinary items less cash flows from operation;
The absolute discretionary accruals is Total accruals less Non-discretionary accruals (is standardized by lagged total assets);
Score is the efficiency score, generated using DEA.

As, ACCR, DA, Score denote total assets, total accruals, discretionary accruals, and efficiency score of DEA; respectively. It can be seen that all variables have positive mean.

Findings on earnings management as to capture corporate governance mechanism:

1. Determine Total Accruals
   Jones (1991) composed the total accruals is the difference between income before extraordinary items and cash flows from operations. The results are shown in appendix 2.
2. Determine the estimate parameters of $\alpha_1, \alpha_2, \alpha_3$ from regression model
   From the sample, the regression model is applied where the dependent variable is total accruals and independent variables are $1/A_{\tau-1}$, ΔREV_{τ}, and PPE_{τ}. The estimates of $\alpha_1, \alpha_2, \alpha_3$ are those obtained from the original Jones model and are generated using the following model:

$$\mathbf{TA_{\tau} = a_1(1/A_{\tau-1}) + a_2(\Delta REV_{\tau}) + a_3(PPE_{\tau}) + \upsilon} \quad \mathbf{(1)}$$

   Where,
   TA_{τ} = total accruals scaled by total assets at τ-1;
   $A_{\tau-1}$ = total assets at τ-1;
   ΔREV_{τ} = revenues in year τ less revenues in year τ-1 scaled by total assets at τ-1;
   PPE_{τ} = gross property, plant, and equipment in year τ scaled by lagged total assets;
   $a_1, a_2, a_3 = \alpha_1, \alpha_2, \alpha_3$ (parameters);
   υ = error terms;

   Using SPSS software, it generates coefficient parameters, as shown below, that will be used to calculate nondiscretionary accruals amount.

Table 2. Regression analysis results

Coefficients(a)		
Model		**Unstandardized Coefficients**
		B
1	1/Tat-1 (bill Rp)	9.776
	Rev/Tat-1	0.0717
	PPEt/Tat-1	-0.0746
a	Dependent Variable: ACCRUALS	

3. Compute predicted Nondiscretionary accruals
   After estimating the parameters of α_1, α_2, α_3 from regression model, in the Modified version model of Jones (Dechow, P., Sloan, R., and Sweeny, A., 1995), nondiscretionary accruals are estimated as:

$$\mathbf{NDA}_{\tau} = \alpha_1(1/A_{\tau-1}) + \alpha_2(\Delta REV_{\tau} - \Delta REC_{\tau}) + \alpha_3(PPE_{\tau}) \quad (2)$$

   Where,
   $A_{\tau-1}$ = total assets at τ-1;
   ΔREV_{τ}= revenues in year τ less revenues in year τ-1 scaled by total assets at τ-1;
   ΔREC_{τ}= net receivables in year τ less net receivables in year τ-1 scaled by total assets at τ-1;
   PPE_{τ} = gross property, plant, and equipment in year τ scaled by total assets at τ-1;
   $\alpha_1, \alpha_2, \alpha_3$ = firm – specific parameters;

4. Compute Discretionary accruals
   The discretionary accruals are then computed by subtracting the predicted level of nondiscretionary accruals (NDAP) from total accruals (standardized by lagged total assets) (Dechow et al, 1995). Since discretionary accruals may be positive or negative, this research uses the absolute value of discretionary accruals in the study. The discretionary accruals of each company is presented in appendix 4.

As with corporate governance relates to earnings management, the absolute value of discretionary portion of total accruals (as proxy of earnings management) is used in this study to capture corporate governance. Then, it will be examined to correlate with the efficiency scores computed from DEA.

Data Envelopment Analysis (DEA)

Refer to Banker et al (1984), those firms that reach the efficient frontier are efficient, while those firms below the efficient frontier are inefficient. It is efficient, if the efficiency score is denoted by 1 (efficient frontier). The result of DEA analysis, two firms are categorized as efficient are PT Sugi Samapersada Tbk (100%) and PT Surya Intrindo Makmur Tbk (100%). While the remaining are inefficient. The efficiency score of each company is presented in appendix 5.

Spearman's Correlation

This study then uses Spearman's Rank Correlation in order to analyze the correlation between discretionary accruals and efficiency scores, because the required condition of normality is unsatisfied.

Table 3. Spearman's Rank Correlation analysis results

			Discretionary accruals	**Efficiency score**
Spearman's rho	**Discretionary accruals**	Correlation Coefficient	1	0.196
		Sig. (2-tailed)	.	0.266
		N	34	34
	Efficiency score	Correlation Coefficient	0.196	1
		Sig. (2-tailed)	0.266	.
		N	34	34

Although the discretionary accruals appear to have a positive correlation to company's efficiency score, the statistic is insignificant at $\alpha = 0.05$. Since discretionary accruals is used as a proxy to the corporate governance, the result implies that there is no significant relationship between corporate governance and company's efficiency.

This research finding is aligned with previous study of Sulistyanto and Wibisono (2003), where they found that earnings management before and after implementing GCG practices has no significant differences in terms of corporate governance

The results could also imply that discretionary accrual approach fails to capture corporate governance characteristics in Indonesia.

Another possible explanation is that commonly, companies in Indonesia create multiple accounting reports. Thereby, they might use much earnings management when they engage in obtaining loan from bank or for the purpose of tax report. As the discretionary opportunities rise, the dual-book system is clouding the true picture of how firms are actually performing (Cullen and Desai, 2005).

According to the pillars of GCG (KNKG, 2006), "The Government of Indonesia must construct rules and regulations that enhance sustainable, efficient, and transparent business; and must implement consistent law enforcement in order to incorporate GCG." However, Corruption and bribery are clouding significantly to the portrait of Indonesian economy. It is not possible to achieve a sustainable business when "additional" fee exists in the business itself (Daniri and Simatupang, 2008). As a result, corporate governance in Indonesia might be poorly employed, as shown by the high level of corruption activity. Based on Index Perception of Corruption, in a range of 0-10, Indonesia had a score of 1.7 in year 1999-2000, a score of 2.0 in year 2004, and a score of 2.2 in year 2005. Although its score improved slightly, Indonesia still considered as a highly corrupt country. Noting 0 represents the highest level of corruption, while 10 represents the lowest level of corruption (Lubis, 2005; Wijaya, 2008)

CONCLUSION

This research is aimed to investigate whether corporate governance is correlated with company's relative efficiency specifically for public companies listed in Indonesia Stock Exchange. Throughout this research, the discretionary portion of total accruals is used to detect earnings management and hence, is expected to capture corporate governance. Klein (2002) shows corporate governance is related to earnings management. To calculate the relative efficiency scores, this research employs DEA of Charnes-Cooper-Rhodes output orientation model. In summary, this research find that the correlation coefficient between discretionary portion of total accruals (as proxy of earnings management) and company's relative efficiency is not significant. Therefore, it is concluded that there is no relationship between the corporate governance and company's efficiency.

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APPENDICES

Appendix 1: Sample of 34 Public Companies Listed in IDX

No.	COMPANIES	CODE
1	PT AdeS Waters Indonesia Tbk	ADES
2	PT Aqua Golden Mississippi Tbk	AQUA
3	PT Astra Otoparts Tbk	AUTO
4	PT Sepatu Bata Tbk	BATA
5	PT Primarindo Asia Infrastructure Tbk	BIMA
6	PT Indo Kordsa Tbk	BRAM
7	PT Cahaya Kalbar Tbk	CEKA
8	PT Delta Djakarta Tbk	DLTA
9	PT Ever Shine Textile Industry Tbk	ESTI
10	PT Goodyear Indonesia Tbk	GDYR
11	PT Gudang Garam Tbk	GGRM
12	PT Gajah tunggal Tbk	GJTL
13	PT Hanjaya Mandala Sampoerna Tbk	HMSP
14	PT Indofarma Tbk	INAF
15	PT Indofood Sukses Makmur Tbk	INDF
16	PT Indocemenet Tunggal Prakasa Tbk	INTP
17	PT Kimia Farma Tbk	KAEF
18	PT Kabelindo Murni Tbk	KBLM
19	PT Kalbe Farma Tbk	KLBF
20	PT Merck Tbk	MERK
21	PT Multi Bintang Indonesia Tbk	MLBI
22	PT Mustika Ratu Tbk	MRAT
23	PT Nipress Tbk	NIPS
24	PT Pan Brothers Tex Tbk	PBRX
25	PT Prima Alloy Steel Tbk	PRAS
26	PT Prasidha Aneka Niaga Tbk	PSDN
27	PT Pyramid Farma Tbk	PYFA
28	PT Roda Vivatex Tbk	RDTX
29	PT Bentoel International Inv. Tbk	RMBA
30	PT Surya Intrindo Makmur Tbk	SIMM
31	PT Sekar Laut Tbk	SKLT
32	PT Siantar TOP Tbk	STTP
33	PT Sugi Samapersada Tbk	SUGI
34	PT Ultra Jaya Milk Tbk	ULTJ

Appendix 2: Total Accruals of 34 Companies

COMPANIES	TOTAL ACCRUALS
PT AdeS Waters Indonesia Tbk	8,257,000,000
PT Aqua Golden Mississippi Tbk	(62,317,731,688)
PT Astra Otoparts Tbk	(200,023,000,000)
PT Sepatu Bata Tbk	21,584,649,000
PT Primarindo Asia Infrastructure Tbk	12,799,890,465
PT Indo Kordsa Tbk	(116,608,469,000)
PT Cahaya Kalbar Tbk	115,035,640,933
PT Delta Djakarta Tbk	(94,030,394,000)
PT Ever Shine Textile Industry Tbk	(57,682,573,508)
PT Goodyear Indonesia Tbk	82,161,503,000
PT Gudang Garam Tbk	1,680,592,000,000
PT Gajah tunggal Tbk	(139,150,000,000)
PT Hanjaya Mandala Sampoerna Tbk	(420,049,000,000)
PT Indofarma Tbk	255,161,221,005
PT Indofood Sukses Makmur Tbk	2,458,223,000,000
PT Indocemenet Tunggal Prakasa Tbk	253,461,707,948
PT Kimia Farma Tbk	98,625,504,951
PT Kabelindo Murni Tbk	43,578,791,515
PT Kalbe Farma Tbk	687,529,085,774
PT Merck Tbk	39,307,457,000
PT Multi Bintang Indonesia Tbk	(37,333,000,000)
PT Mustika Ratu Tbk	4,418,836,731
PT Nipress Tbk	22,165,340,857
PT Pan Brothers Tex Tbk	116,842,388,329
PT Prima Alloy Steel Tbk	(15,759,370,210)
PT Prasidha Aneka Niaga Tbk	(3,516,938,366)
PT Pyramid Farma Tbk	6,757,921,101
PT Roda Vivatex Tbk	(30,051,604,047)
PT Bentoel International Inv. Tbk	460,198,538,373
PT Surya Intrindo Makmur Tbk	9,015,718,045
PT Sekar Laut Tbk	(2,574,354,684)
PT Siantar TOP Tbk	37,809,999,521
PT Sugi Samapersada Tbk	11,690,628,020
PT Ultra Jaya Milk Tbk	(232,926,451,331)

Appendix 3: Nondiscretionary Accruals of 34 Companies

COMPANIES	NDA_t
PT AdeS Waters Indonesia Tbk	(0.04143477)
PT Aqua Golden Mississippi Tbk	(0.03503182)
PT Astra Otoparts Tbk	(0.00098496)
PT Sepatu Bata Tbk	(0.00451553)
PT Primarindo Asia Infrastructure Tbk	0.03729583
PT Indo Kordsa Tbk	(0.07396497)
PT Cahaya Kalbar Tbk	0.10816783
PT Delta Djakarta Tbk	(0.03820092)
PT Ever Shine Textile Industry Tbk	(0.05679218)
PT Goodyear Indonesia Tbk	(0.08171183)
PT Gudang Garam Tbk	(0.02618748)
PT Gajah tunggal Tbk	(0.04373264)
PT Hanjaya Mandala Sampoerna Tbk	(0.00447019)
PT Indofarma Tbk	0.01001969
PT Indofood Sukses Makmur Tbk	(0.01228308)
PT Indocemenet Tunggal Prakasa Tbk	(0.07944315)
PT Kimia Farma Tbk	(0.00868921)
PT Kabelindo Murni Tbk	(0.00861826)
PT Kalbe Farma Tbk	(0.02063198)
PT Merck Tbk	0.02711785
PT Multi Bintang Indonesia Tbk	(0.04156757)
PT Mustika Ratu Tbk	0.00918529
PT Nipress Tbk	(0.01116154)
PT Pan Brothers Tex Tbk	(0.00843011)
PT Prima Alloy Steel Tbk	(0.06540376)
PT Prasidha Aneka Niaga Tbk	0.01264577
PT Pyramid Farma Tbk	0.06230209
PT Roda Vivatex Tbk	(0.07517862)
PT Bentoel International Inv. Tbk	(0.00099577)
PT Surya Intrindo Makmur Tbk	(0.03349713)
PT Sekar Laut Tbk	0.04633155
PT Siantar TOP Tbk	(0.05890182)
PT Sugi Samapersada Tbk	0.14052361
PT Ultra Jaya Milk Tbk	(0.04647933)

Appendix 4: Discretionary Portion of Total Accruals

COMPANIES	$ACCR_t$	NDA_t	Dat
PT AdeS Waters Indonesia Tbk	0.04619016	(0.04143477)	0.087625
PT Aqua Golden Mississippi Tbk	-0.06989979	(0.03503182)	-0.034868
PT Astra Otoparts Tbk	-0.05790628	(0.00098496)	-0.056921
PT Sepatu Bata Tbk	0.06701637	(0.00451553)	0.071532
PT Primarindo Asia Infrastructure Tbk	0.13171750	0.03729583	0.094422
PT Indo Kordsa Tbk	-0.07499597	(0.07396497)	-0.001031
PT Cahaya Kalbar Tbk	0.18745231	0.10816783	0.079284
PT Delta Djakarta Tbk	-0.15873880	(0.03820092)	-0.120538
PT Ever Shine Textile Industry Tbk	-0.10667697	(0.05679218)	-0.049885
PT Goodyear Indonesia Tbk	0.14174053	(0.08171183)	0.223452
PT Gudang Garam Tbk	0.07067264	(0.02618748)	0.096860
PT Gajah tunggal Tbk	-0.01596936	(0.04373264)	0.027763
PT Hanjaya Mandala Sampoerna Tbk	-0.02603531	(0.00447019)	-0.021565
PT Indofarma Tbk	0.26419356	0.01001969	0.254174
PT Indofood Sukses Makmur Tbk	0.08274924	(0.01228308)	0.095032
PT Indocemenet Tunggal Prakasa Tbk	0.02525040	(0.07944315)	0.104694
PT Kimia Farma Tbk	0.06604568	(0.00868921)	0.074735
PT Kabelindo Murni Tbk	0.10071797	(0.00861826)	0.109336
PT Kalbe Farma Tbk	0.13380706	(0.02063198)	0.154439
PT Merck Tbk	0.11873133	0.02711785	0.091613
PT Multi Bintang Indonesia Tbk	-0.06003683	(0.04156757)	-0.018469
PT Mustika Ratu Tbk	0.01398376	0.00918529	0.004798
PT Nipress Tbk	0.07636747	(0.01116154)	0.087529
PT Pan Brothers Tex Tbk	0.14025132	(0.00843011)	0.148681
PT Prima Alloy Steel Tbk	-0.02902493	(0.06540376)	0.036379
PT Prasidha Aneka Niaga Tbk	-0.01205574	0.01264577	-0.024702
PT Pyramid Farma Tbk	0.07101838	0.06230209	0.008716
PT Roda Vivatex Tbk	-0.05150636	(0.07517862)	0.023672
PT Bentoel International Inv. Tbk	0.11924836	(0.00099577)	0.120244
PT Surya Intrindo Makmur Tbk	0.07661249	(0.03349713)	0.110110
PT Sekar Laut Tbk	-0.01409081	0.04633155	-0.060422
PT Siantar TOP Tbk	0.07307013	(0.05890182)	0.131972
PT Sugi Samapersada Tbk	0.20863552	0.14052361	0.068112
PT Ultra Jaya Milk Tbk	-0.17091386	(0.04647933)	-0.124435

Appendix 5: Efficiency Score using DEA-Solver Software

Rank	DMU	Score
1	PT Sugi Samapersada Tbk	1.00000000
1	PT Surya Intrindo Makmur Tbk	1.00000000
3	PT Primarindo Asia Infrastructure Tbk	0.41710021
4	PT Delta Djakarta Tbk	0.22662260
5	PT Merck Tbk	0.21931421
6	PT Pan Brothers Tex Tbk	0.19611553
7	PT Indofarma Tbk	0.17062495
8	PT Cahaya Kalbar Tbk	0.14992902
9	PT Prasidha Aneka Niaga Tbk	0.14555425
10	PT Nipress Tbk	0.14438653
11	PT Hanjaya Mandala Sampoerna Tbk	0.14310874
12	PT Astra Otoparts Tb	0.14256013
13	PT Kimia Farma Tbk	0.13592626
14	PT Aqua Golden Mississippi Tbk	0.12485550
15	PT Prima Alloy Steel Tbk	0.12089372
16	PT Sekar Laut Tbk	0.11782688
17	PT Ever Shine Textile Industry Tbk	0.11721893
18	PT Gudang Garam Tbk	0.11471971
19	PT Bentoel International Inv. Tbk	0.11178996
20	PT Kabelindo Murni Tbk	0.11006822
21	PT Sepatu Bata Tbk	0.10996279
22	PT Roda Vivatex Tbk	0.10777714
23	PT Kalbe Farma Tbk	0.10743118
24	PT Goodyear Indonesia Tbk	0.10040554
25	PT Gajah tunggal Tbk	0.09967416
26	PT Siantar TOP Tbk	0.09606318
27	PT Pyramid Farma Tbk	0.09536486
28	PT AdeS Waters Indonesia Tbk	0.09223052
29	PT Indofood Sukses Makmur Tbk	0.09161769
30	PT Multi Bintang Indonesia Tbk	0.08903654
31	PT Indocement Tunggal Prakasa Tbk	0.08744097
32	PT Indo Kordsa Tbk	0.08596934
33	PT Ultra Jaya Milk Tbk	0.07395274
34	PT Mustika Ratu Tbk	0.07176187

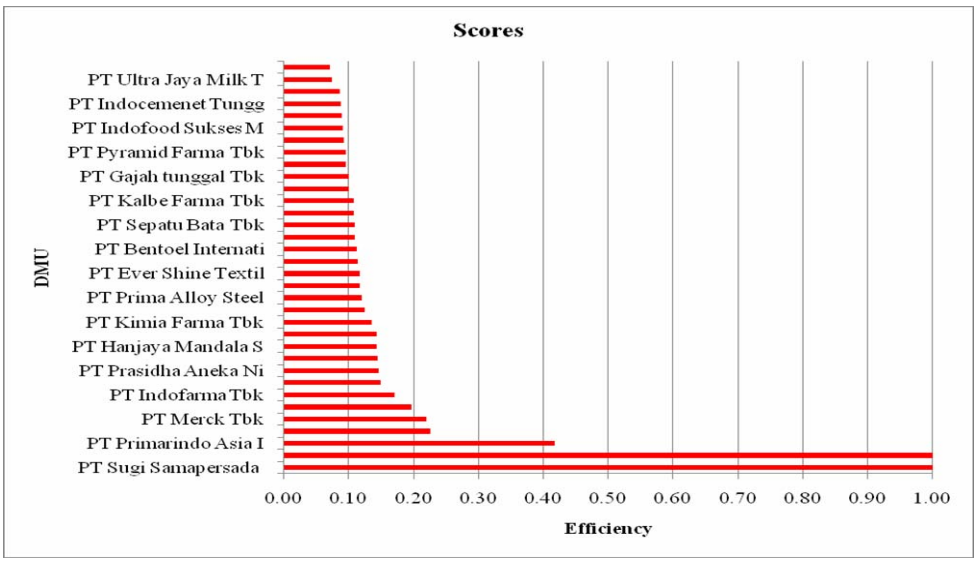

Figure 1. Efficiency Score using DEA-Solver Software

Appendix 6: One-Sample Kolmogorov-Smirnov Test

		Absolute Value	Score
N		34	34
Normal Parameters(a,b)	Mean	.08288270	.18286188
	Std. Deviation	.058078011	.216554181
Most Extreme Differences	Absolute	.090	.355
	Positive	.090	.355
	Negative	-.079	-.304
Kolmogorov-Smirnov Z		.525	2.067
Asymp. Sig. (2-tailed)		.945	.000

a Test distribution is Normal.
b Calculated from data.

Appendix 7: Absolute Value and Efficiency Scores

COMPANIES	Absolute Value	Score
PT AdeS Waters Indonesia Tbk	0.087625	0.092231
PT Aqua Golden Mississippi Tbk	0.034868	0.124856
PT Astra Otoparts Tbk	0.056921	0.142560
PT Sepatu Bata Tbk	0.071532	0.109963
PT Primarindo Asia Infrastructure Tbk	0.094422	0.417100
PT Indo Kordsa Tbk	0.001031	0.085969
PT Cahaya Kalbar Tbk	0.079284	0.149929
PT Delta Djakarta Tbk	0.120538	0.226623
PT Ever Shine Textile Industry Tbk	0.049885	0.117219
PT Goodyear Indonesia Tbk	0.223452	0.100406
PT Gudang Garam Tbk	0.096860	0.114720
PT Gajah tunggal Tbk	0.027763	0.099674
PT Hanjaya Mandala Sampoerna Tbk	0.021565	0.143109
PT Indofarma Tbk	0.254174	0.170625
PT Indofood Sukses Makmur Tbk	0.095032	0.091618
PT Indocemenet Tunggal Prakasa Tbk	0.104694	0.087441
PT Kimia Farma Tbk	0.074735	0.135926
PT Kabelindo Murni Tbk	0.109336	0.110068
PT Kalbe Farma Tbk	0.154439	0.107431
PT Merck Tbk	0.091613	0.219314
PT Multi Bintang Indonesia Tbk	0.018469	0.089037
PT Mustika Ratu Tbk	0.004798	0.071762
PT Nipress Tbk	0.087529	0.144387
PT Pan Brothers Tex Tbk	0.148681	0.196116
PT Prima Alloy Steel Tbk	0.036379	0.120894
PT Prasidha Aneka Niaga Tbk	0.024702	0.145554
PT Pyramid Farma Tbk	0.008716	0.095365
PT Roda Vivatex Tbk	0.023672	0.107777
PT Bentoel International Inv. Tbk	0.120244	0.111790
PT Surya Intrindo Makmur Tbk	0.110110	1.000000
PT Sekar Laut Tbk	0.060422	0.117827
PT Siantar TOP Tbk	0.131972	0.096063
PT Sugi Samapersada Tbk	0.068112	1.000000
PT Ultra Jaya Milk Tbk	0.124435	0.073953