Determinant of Corporate Financial Distress in an Emerging Market Economy: Empirical Evidence from the Indonesian Stock Exchange 2004-2008

Koes Pranowo

Graduate School of Management and Business Bogor Agricultural University, Indonesia
Graduate Program of Management ABFI Institute of Perbanas Jakarta, Indonesia
E-mail: kpranowo@gmail.com (preferred) or koes@sism.co.id

Noer Azam Achsani

Department of Economics and Graduate School of Management and Business
Bogor Agricultural University, Indonesia
E-mail: achsani@yahoo.com (preferred) or achsani@mb.ipb.ac.id

Adler H.Manurung

Graduate School of Management and Business Bogor Agricultural University, Indonesia
Graduate Program of Management ABFI Institute of Perbanas Jakarta, Indonesia
E-mail: manurung_adler@yahoo.com

Nunung Nuryartono

Department of Economics and Graduate School of Management and Business
Bogor Agricultural University, Indonesia
E-mail: nuryartono@yahoo.com

Abstract

This study empirically examines the dynamics of corporate financial distress of public companies (non financial companies) in Indonesian (IDX) for the period of 2004-2008. Using panel data regression, we analyze internal and external factors affecting corporate financial distress. To distinguish the status of financial condition, the process of integral corporate financial distress is classified into four steps: good, early impairment, deterioration and cash flow problem companies.

The results show that current ratio (CR), efficiency (Eff), equity (EQ) and dummy variable of the status good financial condition (D3) have positive and significant influences to Debt Service Coverage (DSC) as a proxy of financial distress. On the other hand, leverage (Lev) has a negative and significant relation with DSC. Other variables such as profit, retain earning (RE), good corporate governance (GCG) and macroeconomic factor have no significant impact on the status of corporate financial distress. Furthermore, the analysis indicated that profitable companies should not be a guarantee that the companies can survive to fulfill its liabilities. Liquidity of companies which can be a prominent point can be recognized by evaluating cash flow performance.

1. Introduction

The phenomenon of financial difficulties in Indonesian public companies had been occurred when oil price shock in 2005 and sub-prime mortgage crisis in 2008. These two different cases lead corporate financial distress of the public companies in Indonesia. In 2005, when Indonesian government reduced subsidy for oil price locally, this made cost of production increased and squeezing profitability. This made many companies in IDX had been delisting as effect of a big losses and shortage of cash. The indication can be recognized by increasing non performing loan (NPL) in commercial banks increased to IDR.68 trillion in March 2006 from IDR.61 trillion in October 2005. The same phenomena had been occurred in 2008, the business activities were contraction in international market due to global financial crisis and NPL increased again to IDR. 60.6 trillion in March 2009 from IDR.55.4 trillion in November 2008. (source: http://www.bi.go.id). Thus, public companies listed on Indonesia Stock Exchange (IDX) are very sensitive with external factors.

Financial distress is the situation when a company does not have capacity to fulfill its liabilities to the third parties (Andrade and Kaplan, 1998). Increasing Non Performing Loan (NPL) of commercial banks and delisted of public companies in Indonesia is a typical phenomenon of corporate financial distress. The status of financial distress companies are classified between solvent and insolvent. To be classified as a financially distressed, the companies is in the position of minimum cash flow and most probably companies to make default payment and cannot fulfill financial liabilities to its vendors or clients. The consequence of financial distress the companies will get dead weight losses. The steps of integral corporate financial distress beginning of early impairment when revenue decreased more than 20% as a symptom companies will be financial distress, deterioration when the profit decreased more than 20% and cash flow problem when operational cash flow negative.

Researches on the dynamic of financial distress have been conducted many years in many countries. Fitzpatrick (2004) investigated dynamic of financial distress among US. Publicly- traded non-financial companies. He developed and tested a parsimonious model that measures a firm's financial condition. A firm's Financial Condition Score (FCS) is based on three variables: the firm's size, its leverage and the standard deviation of the firm's assets. FCS are calculated for 3,689 in 1988, 3,910 in 1993 and 4777 in 1998, respectively. Hypothesis 1: Firms with higher leverage have higher numerical credit ratings. Hypothesis 2: Larger firms have lower numerical credit ratings. Hypothesis 3: Firms with higher business risk (σA) have higher numerical credit rating. The result indicate no support for the first hypothesis, distress firms issue equity more often than they issue debt. Inconsistent with the second hypothesis, firms that issue equity fail less often than firms issue debt. The third, distress firms do issue outside equity and distress firms that use the proceed from external financing activities to cover an operating loss are significantly more likely to fail than firms that invest the funds.

Outecheva (2007) made an empirical research to public companies in USA which are under financial distress. The study concern risks of corporate financial distress. Three different approach in the research: Change of cost of capital, the different between systematic risk and un-systematic risk and management style to face financial distress before going to bankruptcy. The research divided into two parts, before and after 1990s.

The technique of distress risk assessment before the 1990s were dominated by static single-period models which try to find unique characteristics that differentiate between distress and non-distress firms and after 1990s has led to the development of dynamic models which would be able to determine each firms' distress risk at each point in time. The empirical result he develop an integral concept of financial distress which can be used as a theoretical basis for developing more complex and sophisticated models. Two issues are important: First, financial distress implies that the value of a firm's equity in such situation lies below the value of debt (under funding). The firm does not have enough coverage to borrow additional debt through the bank. Second, percentage of firms recovered

from financial distress varies from 10% to 34% dependent on the sample selection length of time series and economic condition.

Almeida dan Philippon (2000) analyzed The Risk-Adjusted Cost of Financial distress. The research has been done in United States for public companies which have issued corporate bonds and got difficulties to pay coupon and the principal. Other variables which have been evaluated: Capital structure and corporate valuation practice in related with financial distress in direct cost and indirect cost. In order to evaluate cost of financial distress, the companies have been analyzed by evaluating risk adjusted NPV of financial distress and credit spread. The empirical result is indicated that distress cost are too small to overcome the tax benefits of increased leverage. The marginal tax benefit is constant up to a certain amount of leverage and then it start declining because firms do not pay taxes in all states of nature and because higher leverage decrease additional marginal benefits.

Altman(2000), set up a new model in predicting financial distress of companies by revisiting the Z-Score model (1968) and Zeta (1977) credit risk model. He used financial and economic ratio will be analyzed in a corporate financial distress. The prediction use discriminating function by linier regression model where Z is overall index and other financial variables to be an independent variables such as: working capital/total assets, retain earning/total assets, earning before interest and tax/total assets, market value equity/book value of total liabilities and sales/total assets. The empirical result of distress and non-distress companies Z-Score very accurate to predict failure model.

Chiang Hu and Ansell (2005) studied about financial distress prediction by using five credit scoring technique, Naïve Bayes, Logistic Regression, Recursive Partitioning Artificial Neural Network and Sequential minimal optimization. A sample of 491 healthy firms and 68 distress retail firms. Two approach in analyzing: An international comparison analysis of three retail market models-USA, Europe and Japan. All market models display the best discriminating ability one year prior to financial distress. The US market model performs relatively better than European and Japanese models five years before financial distress. A composite model is constructed by combining data from US, European and Japanese markets. All five credit scoring technique have the best classification ability in the year prior to the financial distress, with accuracy 88%. The result is indicated Sequential Minimal Optimization is the better performing model amongst the other models, closely follow by the neural network model. Logistic regression model shows lowest performance in terms of similarity with Moody's.

Janes (2003) analyzed relationship between accruals report and debt covenants. The evaluation concern lenders make prediction of financial distress based on high accruals. He examine whether firm's accounting accruals provide information that is useful in predicting financial distress as reflected in the initial tightness of debt covenant. Test of the relation between accruals and financial distress indicate that accruals provide information for prediction financial distress and the result indicate that lender do not fully consider the relation between accruals and financial distress when setting the initial tightness of debt covenant.

Theodossiou *et al* (1996), analyzed factors that influence the decision to acquire a financially-distress firm in US using qualitative criteria of distress such as: debt default announcement, debt renegotiation efforts and inability to meet debt obligation. The result suggest that financial leverage, profitability, managerial effectiveness, the firm's growth and size are important explanatory variables in financial distress model. Moreover, sales generating ability of the firm, inefficient management, proportion of productive assets to total assets and return on productive assets are positively related to the probability of acquisition of a financial distress firms. Insider control and financial leverage, on the other hand are negative related to the probability of acquisition.

Mostly, study financial distress has been done in developed countries and only a few study were carried out using data from the developing countries. Zulkarnain (2009), study to formulate a model that predicts corporate financial distress and apply the model to trace the potential failure Malaysian financially distressed firms due to the Asian Crisis in 1997. The data has been evaluated by Z Score with a new model: Distress-Grey area distress – Grey area non distress – Non distress. He found 5 out of 64

financial ratios significant to discriminate distress and non distress: (1) total liabilities to total assets, (2) assets turnover, (3) inventory to total assets, (4) sales inventory, (5) cash to total assets.

As long as Indonesia is concerned, Brahmana (2004) analyzed the financial ratios to indentify factors that can make a corporate financial distress condition by analyzing historical data and comparing it to current condition. The research population is Indonesia manufacture companies. The sample are companies which delisted in from Jakarta Stock Exchange and all listed manufacture companies for the period of 2000-2003. The statistic method that used in the research is regression of logistic test. Overall, the research results that unadjusted financial ratios have higher classification power than industry relative ratios and He found 1% of total sample data will be financial distress. Another important highlight is the auditor reputation has insignificant relation to the financial distress condition.

Luciana (2006) analyzed public companies at Jakarta Stock Exchange between 2000-2001. The sample consist of 43 firms positive net income and positive equity book value and still listed, 14 firms with negative income and still listed, 24 firms with negative income and negative equity book value and still listed. The study is used three models to examine the role of financial ratio in predicting the assurance of financial distress in the context of Jakarta Stock Exchange. The hypothesis has been examined by multinomial logit regression to test the role of financial ratio from statement of income, balance sheet and statement of cash flow. The finding of this research that financial ratio from statement of income, balance sheet and statement of cash flow are significant variables to determine financial distress firms.

Pranowo *et.al* (2010) analyzed financial distress by mapping 220 non financial companies which are listed on Indonesia Stock Exchange (IDX) for the period of 2004-2008 into the steps of integral financial distress. The result is indicated that deterioration is the most affect to financial distress for Indonesia public companies and mapping into five different industrial sectors. With the result that mining companies is the most affected by global financial crisis. On the other hand, agriculture business is the best industry which can solve problem in global financial crisis.

However, it is still important to explore this topic further due to some aspects. Due to the limited literature concerning the dynamic of financial distress in the developing countries, it is therefore interesting to study corporate financial distress in emerging market economy such as Indonesia. Furthermore, previous studies are based mainly on financial ratios. In fact, the ability to fulfill short term liabilities will depend on the cash flow performance. Thus, financial distress should not be analyzed by financial ratios at balance sheet only, but also by analyzing profit and loss and cash flow of the companies.

In this paper, we explore the dynamic of financial distress among companies listed in the Indonesian stock exchange –a very dynamic and less explored emerging market. We use not only financial ratios in balance sheet and income statement for predicting financial distress, but also introducing cash flow performance (proxy by DSC) which has close relationship with the financial distress and never been analyzed in the previous research. Implementation of good corporate governance (GCG) and macroeconomic factor will also been included in the analysis.

The rest of the paper is organized as follows. In section 2 we explain the data and methodology. Section 3 gives statistic descriptive and explanatory data analysis. Section 4 Empirical results and discuss about financial strategic implementation. Section 5 Summarized the research finding and gives concluding remarks.

2. Data and Methodology

The data in the research consist of financial statement of two hundred non financial companies listed on Indonesia Stock Exchange (IDX) for the period of 2004-2008. (Source: http://www.idx.co.id) The study is focus on the ability of non-financial companies to fulfill short term such as: loan repayments, interest burden, account payable and dividend payout for the period of 2004-2008. In order to test the hypothesis, financial ratios of 200 non-financial companies are analyzed using panel data regression

model. Among them, there are 32 out of 200 public companies in financially-distress. This is indicated by DSC < 1.2. They are 11 companies in agriculture business, 20 companies in manufacturing and 1 company in mining industry.

In our evaluation, we use Debt Service Coverage (DSC) ≤ 1.2 is a proxy of Corporate Financial Distress (Jeff Ruster, 1996). This means fund availability divided by due date all of company's liabilities. The computation of DSC can be explained at equation below.

$$DSC = (EAT + (Depr. + Amort) + Interest\ and\ or\ Coupon) - Tax)/(Principal + Interest\ and\ or\ Coupon) \quad (1)$$

Note:

EAT   : Earning After Tax is the bottom line of profitability
Depreciation   : Allocation investment cost of fixed assets for the economical life time
Amortization   : Allocation investment cost of intagible assets for the economical life time
Interest   : Interest expenses per annum from bank loan
Coupon   : Interest of corporate bond per annum
Principal   : Installment payment of loan or repayment of corporate bond
Tax   : Corporate tax per annum

The framework of the analysis can be seen in Figure 1. The endogenous variables are current ratio, profitability, efficiency (EBITDA/TA), leverage (due date of loan payable plus interest and or coupon / fund availability), retain earning, equity, good corporate governance (GCG) and macroeconomy (MECO). We made dummy variable 1 for implementation GCG and 0 for others. To analyze the various financial condition during the research period, the companies have been classified following the steps of integral financial distress: Good – Early impairment – Deterioration – Cash flow problem. By using cash flow problem to be a reference, we make dummy variables D1= deterioration, D2=early impairment and D3=good.

The underlying hypothesis in this research are as follows:

Profitability: Net profit to Total Sales indicate what is net income can be raised from the total revenue of the companies and the effect to DSC due to not all of profit can be cashed as source of funds. Therefore, we need to test **Hypothesis 1**;

$H1_0$**:** There is no correlation between NP/TS (Profit) and DSC.

$H1_1$**:** There is correlation between NP/TS (Profit) and DSC.

Current Ratio: Current assets to Current liabilities indicate the ability of short term assets to cover short term liabilities. This is important, because not all of current asset can be cashed due to overdue of account receivable, inventory and prepaid expense which has already paid out. Therefore, we need to test **Hypothesis 2**;

$H2_0$**:** There is no correlation between CR and DSC.

$H2_1$**:** There is correlation between CR and DSC.

Efficiency: Earning before tax, depreciation and amortization to Total assets (EBITDA/TA). This indicates productivities of company's assets to generate income. For companies which have a negative profit, cash availability only be contributed by depreciation and amortization. Therefore, we need to test **Hypothesis 3**;

$H3_0$**:** There is no correlation between EBITDA/TA (Eff) and DSC.

$H3_0$**:** There is correlation between EBITDA/TA (Eff) and DSC.

Figure 1: Framework of the analysis
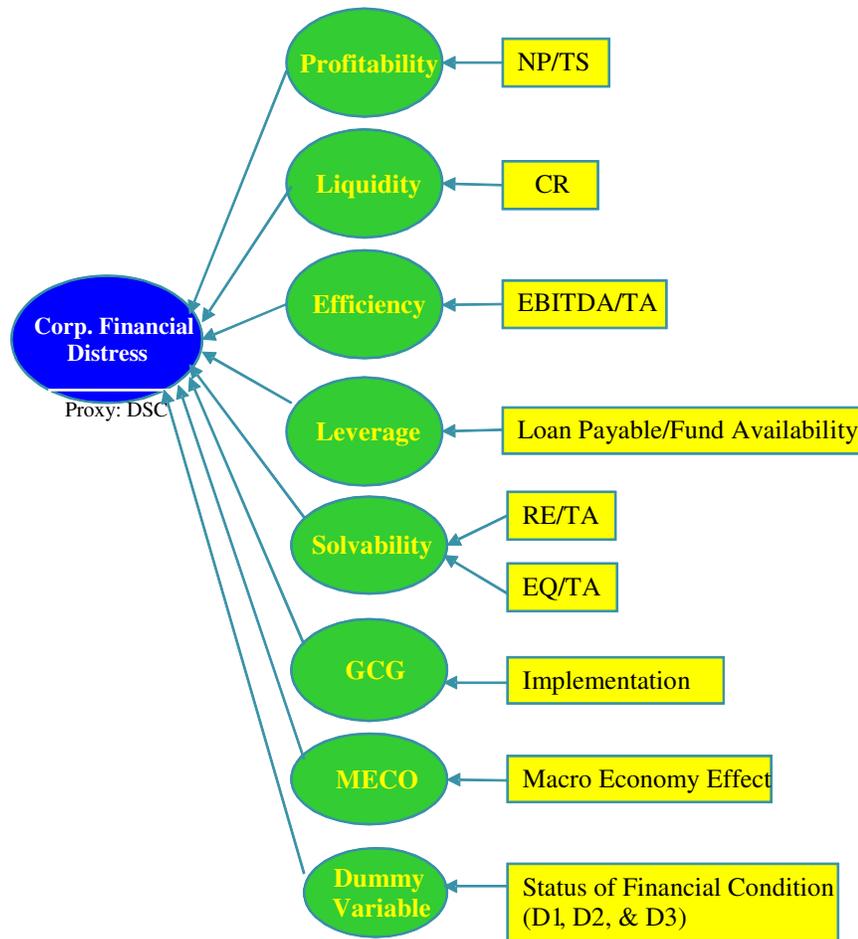
Note:

Profitability	:	Net profit to Total Asset
Current Ratio	:	Current Assets to current liabilities
EBITDA	:	Earning Before Interest, Tax, Depreciation and Amortization
TA	:	Total Assets of Company
Leverage	:	Due date of loan and other liabilities to fund availability
RE	:	Retain Earning is accumulated profit (excluded dividen pay out)
EQ	:	Equity is paid in capital which is book value of capital
GCG	:	Implementation of Good Corporate Governance
MECO	:	Impact of Macro Economy (Global financial crisis effect)
Dummy	:	The status of financial condition follow the steps of integral financial distress. Early impairment (D1), Deterioration (D2) and Good Companies (D3)

Leverage: Loan Payable to Fund availability. This is related to loan management. Thus, all of due date loan and other liabilities should be managed in order to match with fund availability. This is an indicator of company in borrowing power. Therefore, we need to test **Hipotesis 4;**

> $H4_0$: There is no correlation between leverage (Lev) and DSC.
> $H4_1$: There is correlation between leverage (Lev) and DSC.

Retain Earning: Parts of the Profit from a company is divided to share holders and the remaining will hold in the company to be retain earning as source of investment capital. Therefore, we need to test **Hypothesis 5;**

> $H5_0$: There is no correlation between RE/TA and DSC.
> $H5_1$: There is correlation between RE/TA and DSC.

Equity: Size of a company can be recognized by Equity and for most of company's business activities will be depend on its assets. Thus, to analyze size of equity should be compare to total assets. Therefore, we need to test **Hypothesis 6;**

H6$_0$: There is no correlation between EQ/TA and DSC.
H6$_1$: There is correlation between EQ/TA and DSC.

Good Corporate Governance (GCG): Implementation of GCG will affect to public companies which must implement 5 criteria: Transparancy, accountability, responsibility, independency and fairness. This means company which have already implemented GCG tend to be good company and not being financial distress. Therefore, we need to test the **Hypothesis 7;**

H7$_0$: There is no correlation between GCG and DSC.
H7$_1$: There is correlation between GCG and DSC.

Macro Economy Effect (MECO): Certain industry is significant to have macro economy effect. We found mining industry is the most significant industry in global financial crisis effect. This is indicated when case of Sub-mortgage makes global financial crisis in 2008 due to US Dollar repatriation. Therefore, we need to test the Hypothesis 8

H8$_0$: There is no correlation between MECO and DSC.
H8$_1$: There is correlation between MECO and DSC.

The Status of Financial Condition (Dummy category): The status of financial distress classified follow the steps of integral corporate financial distress (Good, early impairment, deterioration and cash flow problem companies). Every cluster is made a dummy variable: D1, D2 and D3. Thus, every different financial condition has different impact to financial distress. Therefore, we need to test **Hipotesis 9;**

H9$_0$: There is no correlation between Dummy variables D1, D2 and D3 to DSC
H9$_1$: There is correlation between Dummy variables D1, D2 and D3 to DSC

3. The Empirical Result

In this section, we present the important finding of our analysis. Data is analyzed by panel data regression model under Panel Least Squares Method with Fixed Effect. Autocorrelation test based on Durbin-Watson Statistik (DW) indicate 2,09 (2< DW<4). This means the above model has no autocorrelation problem. The coefficient of determination R-square (R^2) indicates that 64,20% behavior of financial distress variables DSC can be explained by the independent variables (Profit, CR, Eff, Lev, RE, EQ, MECO and dummy status financial distress). Overall, F-statistic 6.69 with p-value 0.00 indicates that the regression model is feasible.

The result of financial ratios indicate, current ratio, efficiency and equity are statistically significant and have positive influence on the financial distress, whereas leverage has significant but negative influence to financial distress. The result also indicates that the dummy GCG has no significant impact on the DSC. The possible reasons for this phenomena is that officially all of public companies in IDX implement GCG. In fact, not all of companies execute GCG's principle such as: Transparency, Accountability, Responsibility, Independently dan Fairness. See Table 1 for complete results.

Table 1:   Regression Panel Data Model of Financial Distress

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.667022	0.380307	1.753904	0.0798
PROFIT	-0.070611	0.307887	-0.229341	0.8187
CR	0.001831	0.000786	2.328295	0.0201
EFF	7.234091	1.666285	4.341449	0.0000
LEV	-6.55E-05	3.68E-05	-1.782710	0.0750
RE	0.529598	0.459327	1.152988	0.2493
EQ	1.597133	0.736642	2.168126	0.0304
MECO	0.735398	0.688489	1.068133	0.2858
D1	0.189838	0.346588	0.547734	0.5840
D2	-0.456201	0.951067	-0.479673	0.6316
D3	0.518199	0.382894	1.353375	0.1763
	Effects Specification			

Cross-section fixed (dummy variables)			
Period fixed (dummy variables)			
R-squared	0.642033	Mean dependent var	2.587490
Adjusted R-squared	0.545027	S.D. dependent var	4.987375
S.E. of regression	3.364068	Akaike info criterion	5.451381
Sum squared resid	8895.128	Schwarz criterion	6.501640
Log likelihood	-2511.690	Hannan-Quinn criter.	5.850553
F-statistic	6.618474	Durbin-Watson stat	2.099381
Prob(F-statistic)	0.000000		

The result of panel data regression model as presented in Table 1 indicates that **Current ratio** has a positive correlation with DSC, even though very small 0.00183 with p-value 0.02. Current ratio is current assets to current liabilities and not all of current asset can be cashed at a shorterm period, if account receivable overdue. The data is indicated that most of account receivable of the companies is not liquid because the number of correlation is very small.

Efficiency is EBITDA to total assets, this ratio indicate how big generated fund can be created by operating of the company's assets. EBITDA is income before interest expense and corporate tax plus allocation funds from depreciation and amortization which are non-cash expenses. Efficiency is very significant positive correlation to DSC with regression coefficient 7,23. This means, every time the companies improve one ratio efficiency, will improve DSC to 7,23. Hence, by improving effectiveness and efficiency DSC of company will be increase to 7,23 with p-*value* 0,00 which is higher than the minimum of DSC for non-financially distress firm. (7,23 > 1,2). Depreciation and amortization are parts of source of fund in cash flow. Therefore, Efficiency is very significant correlated with DSC.

Other variable **Leverage** has a negative correlation and significant with DSC with p-value 0.07 and coeficient -6.55E-05 (-0.0000655). This means if one unit leverage increase, will make DSC lower to 0,0000655. The more leverage, DSC will be less. On the other hand, A Company which has a lot of loan tend to get Financially-Distress easier due to Liabilities of the loan repayment: principal, interest or coupon of corporate bond.

Equity variable indicate has a significant positive correlation with DSC by coeficient 1,597 and p-*value*s 0,03. This means if we add one unit equity will increase DSC 1,597. Thus, equity is a big contribution to DSC. Equity is a source of fund which does not have any interest burden. Other variables such as: Profit dan Retain Earning (RE) do not have any correlation with DSC with p-value 0.818 and 0.24. The reason because profit and retain earning are counted based on accrual basis, on the other hand DSC is computed based on cash flow performance. Thus, profit and RE have not confirmed yet to create cash due to accounting procedure.

The Macro Economy influences (MECO) have a positive correlation but are not significant with p-value 0.28. In this case, the most effected industry by global financial crisis is mining. However, mining industry is just small portion of the total population of Non financial companies listed on IDX. Other variables in our analysis is the financial condition status follow the steps of integral financial distress; dummy(D1= 1 if deterioration status, others=0, D2=1 if early impairment status, others =0, and D3=1 if good company status, others = 0). The research indicates the status (D1, D2, and D3) are significant correlation with DSC if alpha 5% or 10%. However, if alpha 20%, D3 has a positive correlation with coeficient 0,518 and p-*value* 0.176. This means if financial condition is good, the correlation to DSC is 0,518.

4. Concluding Remarks

This paper attempt to analyze financial variables which affect to financial distress of public companies listed in Indonesian Stock Exchange (IDX) for the period of 2004-2008. By using Panel Data Least Square Regression Model, we found that financial variables which significantly influence the corporate financial distress are:

(1) Current ratio: Current Assets to current liabilities
(2) Efficiency: EBITDA to total assets
(3) Leverage: Due date account payable to fund availability
(4) Equity: Paid in capital (capital at book value)

The result suggests that management of public companies should monitor financial variables which affect to financial distress, from in the beginning at the stage of early impairment as a symptom of financial distress, deterioration and cash flow problem, when operational cash flow is negative.

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Determinant of Corporate Financial Distress in an Emerging Market Economy: Empirical Evidence from the Indonesian Stock Exchange 2004-2008

Koes Pranowo Graduate School of Management and Business Bogor Agricultural University, Indonesia Graduate Program of Management ABFI Institute of Perbanas Jakarta, Indonesia E-mail: kpranowo@gmail.com (preferred) or koes@sism.co.id Noer Azam Achsani Department of Economics and Graduate School of Management. and Business Bogor Agricultural University, Indonesia E-mail: achsani@yahoo.com (preferred) or achsani@mb.ipb.ac.id Adler H.Manurung Graduate School of Financial Management from an Emerging Market Perspective. Edited by Guray Kucukkocaoglu and Soner Gokten. Show +.

1. Introduction.

Â Literature of corporate financing documents that agency problem in ownership structure impacts firm performance significantly. Nevertheless, not many studies tackle the issue of how concentrated ownership structure, particularly family-owned firms, impacts capital structure by taking into account the agency problem especially on emerging markets. [1] argues that the agency conflicts between the owner and the manager occur when the manager manipulates the capital structure decisions to reap wealth through activities that do not lead to value maximization. Stock Exchange 2004-2008.

Koes Pranowo Graduate School of Management and Business, Bogor Agricultural University, Indonesia Magister of Management Post Graduate Program, ABFII Institute of Perbanas, Indonesia.

Â Abstract This paper empirically examines the dynamics of financial distress among non-financial companies listed on the Indonesian Stock Exchange (IDX) during the period of 2004-2008. Two different events affected the performance of public companies being financial distress. Â The evidence indicated that the mining companies are the most affected companies by global financial crisis in 2008, whereas manufacturing companies are the most affected companies by oil price shock in 2005. 138.