

## Determinants of Capital Structure: Evidence from Financially Distressed Firms in Malaysia

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**Abstract:** The purpose of this research is to contribute to the finance literature by providing further evidence on the determinants of capital structure. This research is novel given the fact that not many researches has been done on firms classified as financially distressed. In this research, firm level yearly data of firms listed as financially distressed under the requirement of Practice Notes 4, Amended Practice Notes 17 and Practice Notes 17 were used. The final sample consists of 190 observations. Static panel data analysis techniques were considered in analyzing the data. The results of the regression suggest that firm's changes in investment, investment opportunity, tangible assets, intangible assets and liquid assets is the independent variable found to have a statistically significant relationship with capital structure. The remaining independent variables do not appear to have a statistically significant relationship with capital structure.

**Keywords:** *Financially Distressed Firms, Capital Structure, Capital structure, Affected Issuers*

### INTRODUCTION

The theory of capital structure has been one of the most disputative issues in the theory of the finance during the past quarter century. The geneses of the controversy were the original contributions by [1]. One of the most crucial decisions in business organization is capital structure decision and this decision can influence the firm value especially the firms which are categorized as financially distressed [2]. Financial distress, insolvency and liquidation may happen as consequence of inefficient financial decision made by the firms to fund its business activity [3]. Therefore, high capital structured companies should evaluate an appropriate capital structure to minimize its costs [3]. The main objective of this research is to provide further evidence on the determinants of capital structure. The result of empirical research show that the determinant capital structure has affect many factors. The variables in the models are selected based on their importance in specific theory, policy or both. Because of the importance of this topic, previous research has been using different samples from countries such as France (John, 1999), Germany [4] [5] [6], Japan [4], United Kingdom [4], Malaysia [7], [8]. In Malaysia, the research has been conducted in sectors such as electrical and electronic sector [9], food producer sector [10] and government linked company [11]. This

research is novel and original, given the fact that not many researches have done on firm classified as financially distress.

### LITERATURE REVIEWS

To comply with the previous researches, measures linked to the dependent variable and the firm-specific determinants of capital structure were taken from reviewing the previous researches. The following subsections will explain the list of dependent variables and independent variables examined in this research.

#### Theory of Capital Structure

##### Modigliani and Miller (MM) Capital Structure Theory

Modigliani and Miller were the inventors that conducted scientific study on capital structure area in 1958 and developed MM theorem [12]. According to [13], under perfect market, there are no taxes, transaction costs, restructuring and company charges. The company's decision is free of firm market value and capital costs. There are three propositions stated by Modigliani and Miller in MM theory. The first proposition is the financial structure of the business that does not impact the market value and the

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estimated capital cost [14]. The second proposition is the firm's capital structure has no effect on weighted cost of capital [14]. The third proposition is the firm's value is not affected by dividend policy [14]. [13] emphasize that debt financing would raise corporate capital because debt interest is tax deductible while equity expenses are not tax deductible.

### **Agency Cost Theory**

Jensen and Meckling are the pioneers who developed agency cost theory. According to them, an optimal capital structure can be defined by reducing the costs of the company [15]. [16] define the expense of the company as the amount of the principal expenditure control, bonding agents and residual loss. There are two types of conflicts: conflict between shareholder and manager and conflict between shareholder and bondholder [16]. [16] argue that capital structure has agency cost since it causes the agency problem between creditor and shareholder. They state that A financially distressed company's investors are more likely to use the current debt to make risky investments. In other words, the usage of capital structure allows the low-risk assets to be replaced by more risky assets, which [16] named as asset substitution problem. [16] also argue the debt financing can have agency benefit because unlike equity financing, debt financing will not reduce holders' shares. For example, if the company issues equity, the agency's equity costs are likely to occur due to ownership dilution. On the other hand, [17] provide a brand new perspective and state the capital structure reduces the wasteful investment by absorbing the excess cash flow. Jensen's argument, known as "free cash flow hypothesis" or "control hypothesis", state that when a firm has large excess free cash flow, the manager may use the cash in wasteful investment for the sake of empire building or higher pay, reputation and promotion. The director is therefore, driven to run the business as efficiently as possible only if the cash is tight. He cites two ways to solve the issue of excess free cash flow: to declare a dividend permanent raise or to use debt. While the director promises to pay the shareholder cash flow in the first case, he promises to pay the debt holders in the second case. In this sense, the debt holder promise is more binding since in the case of default, debt holders are entitled to take over the firm.

### **Trade-Off Theory**

Trade off theory affirms that the firm's optimal capital structure is determined by diverting the benefits of debt financing with weak debt [18]. Debt benefits include tax shielding, free cash flow reduction, managers and shareholder's conflict and disadvantages include financial distress, investment-related costs and the problem of asset replacement [19]. The trade-off theory implies that companies

prefer debt financing rather than equity until the bankrupt risk of using debt is equal to the profit [12]. Trade off theory suggests more exposure's organizations should afford to pay fewer than the lower exposure's organizations [20]. More debt financing should be used by companies that are using more tangible assets because tangible asset can be used as collateral organization as stated in the theory [20]. Static trade-off theory was developed by Myers in 1984 and it stated that a higher target debt ratio should be aimed by higher profitability firms in order to gain more debt without risking financial distress [14]. As means to ensure a higher tax saving from debt, profitability of bankruptcy is lower and higher over-investment, the larger profitability firms are required to have higher target debt ratio [14]. Meanwhile, companies with high growth opportunities should use less debt financing because more debt in financial distress will cause loss value [21]. [22] developed trade-off theory dynamic version in 1989 and suggested that the passive collection of profits and losses by corporations, allowing their debt ratio to drift away from the target only when the cost of modifying the debt ratio goes beyond the cost of having a sub optimal capital structure [23]. The dynamic off-theory trade means that companies that have in the past achieved high profitability are likely to be capital structured while companies that have suffered losses are probably to be capital structured [23]. This theory assumes the relationship between profitability and observed debt ratios is negative but shows positive result on the profitability of debt versus equity. The negative relationship does not arise due to profitability which affects target capital structure. However, it has an effect on deviation from the target [23]. Therefore, the negative relationship would not arise for firms that offset the deviations from the target by resetting their capital structure [23].

### **Pecking Order Theory**

Another important theory of capital structure is usually seen as an alternative to the theory of trade-offs which is the theory of pecking order. The major argument for this pecking order theory is there is any information on asymmetry between internal (managers) and the external. Since the managers are well informed rather than the outsider investors, their decision policy may indicate some information to the market. Literature on information asymmetry argues that managers can disclose expected cash flow information [24], [25], growth opportunities [26], the firm quality [27], [28] or investment quality [29] by using methods including dividend policy, capital structure decision and etc. The concept of pecking order is related to the signaling through the capital structure decision. The underpinnings of the pecking order theory are discovered by [26]. Presuming managers are acting in the best interests of existing

shareholders, [26] show that new equity issuance will only be taken into account if the existing shareholders' benefits exceed the new shareholders' benefits or, in other words, if the equity is overvalued. Hence, investors are likely to overvalue the stock and the stock price will decrease whenever the firm issues new equity. This is what contributes to theory of pecking order, that specifies if it is necessary, it should be better for businesses to use internal funding. If external funding is needed, then, it would be best to prefer debt over equity since issuing equity will give a bad signal to the market concerning the firm.

### 1.1 Dependent variable: Capital structure

Capital structure is a blend or mixture of debt and equity that firms use to fund their activities and capital structure is used to calculate the debt financing proportion [9]. Capital structure is the dependent variable. In previous research, some authors used one or two dependent variables to study the capital structure. The authors [30] used the dependent variable as the ratio of total debt to net asset, being that net assets are stated as the total assets less account payable and other liabilities. In turn, [31] used as the measure of the capital structure, the ratio of total debt over equity.

### 1.2 Independent variables

#### 1. Change in Investment

There is a firm change in investment. Firm change in investment has a significant and positive impact on the level of capital structure. [32] shows that relationship between change in investment policy and the size of indirect financial distress costs is a negative relationship. It implies that the divestiture tends to increase financial distress costs and it is possible to conclude underinvestment which has a greater influence on financial policy than an overinvestment.

#### 2. Investment Opportunities

Growth is referring to companies's opportunity to spread out and boost their business operation by using a new investment consumption [9]. Growth opportunity reflects on company-owned intangible assets that have no collateral value [33]. Growth opportunity is determined by the percentage change in total asset [34]. As a consequence of this, companies with high opportunities for growth may not issue debt in the first place, and capital structure is expected to be linked negatively to growth opportunities [30], [35] [36],[37],[38],[39]. The trade-off theory anticipates a

#### 6. Expected Earnings Growth

Firms with higher expected earnings growth are considered susceptible to higher losses distress [34]. This is due to their operating value which relies on a high future earnings that is not known yet. In time of distress, these comparatively large value components

negative relationship between both investment opportunities and capital structure. Pecking order theory also indicates that a firm growth is negative impact on its capital structure. The agency problem suggests there is a negative relationship between capital structure and a firm growth.

#### 3. Tangible Asset

Tangible asset refers to plant, building, machinery and equipment commonly used to maximize the sales income. Tangibility is calculated by dividing fixed assets and total assets [14]. [40] propose a positive relation between the collateral value of assets and capital structure. Extending this argument, [41] suggest that if debt is collateralized, borrowers are constrained to use the funds for a specific project only.

#### 4. Intangible Assets

[42] describes intangible assets as assets that are latent, non-monetary and do not have a physical nature while [43] define intangible assets as are identifiable, non-monetary asset and without physical substance. The group of intangible deemed is internally generated from being recognized on the balance sheet [44]. Intangible assets also refer to goodwill, patent, and technology which are used as supportive assets to reinforce [34], [45] use the ratio of the tangible to total assets as proxy for the collateralization of the assets of a corporation and found a negative correlation between this ratio and the capital structure.

#### 5. Liquid Assets

Liquid assets refer to the ability to convert assets into cash without changing the value of the asset [9]. Referring to the principle of trade-off, better liquidity businesses can borrow more debt because they can meet their obligations on time [9]. Furthermore, [46] mentioned that capital structure prevents issues with agencies in particular for companies with high liquidity but lower growth levels. On the other hand, pecking order theory anticipates a negative liquidity-capital structure relationship because higher liquidity companies should use their internal cash instead of borrowing debt. Empirical studies normally support the theory of pecking order and confirm that liquidity and capital structure are inverted [47], [48], [49]. Only [50] find a negative relationship by testing the relationship between liquidity and capital structure for Turkish firms. Following the past literature, liquidity is calculated by dividing current assets by current liabilities [9].

are lost. In addition, industries with large growth opportunities tend to have high potential costs of financial distress, in line with the debt overhang issue.

## 7. Size

Size is related to many aspects of capital structure theory, such as asymmetric information, transaction costs, financial market access and financial distress [34]. Most of the research see size as one of the common factors which decides a company capital structure [9]. The larger companies could get more debt finance because the creditors are willing to lend money, [31]. Larger firms are also able to earn high profits and diversify risks compared to small firms [3]. The size is calculated as the natural log of total assets [14]. When companies grow, they are expected to become more competitive and to acquire more tangible assets along their growth path. As a result, it would seem that such an organization will have a lot of free cash flow. From a pecking order theory viewpoint, there is a prior assumption that, as the company's growth generates more income, it can use the internal recourse generated from the debt market. In comparison to small firms, larger companies are supposed to be poorly geared. The trade-off theory predicts that larger companies appear to be more stable, less volatile and less vulnerable to bankruptcy. For control purposes, companies may prefer debt rather than equity financing. Control considerations assist positive correlation between size and capital structure. Thus, large firms should be more highly capital structures. Some of the past research that consist with the view of trade-off theory are [22], [30], [37], [52], [53], [54], [55], [56], [57], [58], [37].

## METHODOLOGY

### 3.1 Data

The target population was the listed firms as financially distressed by Bursa Malaysia under the requirement of Practice Notes 4 (PN4), Practice Notes 17 (PN17) and Amended PN17 (APN17) respectively, from 15 February 2001 when PN4 was introduced, until 31 December 2011. The list of all affected issuers was obtained from the Media Releases and Companies Announcement from the Bursa Malaysia website from January 2001 to December 2011. The final sample of firms consisted of 190 firms that met the criteria of non-missing data of financial distress costs and other

Similar Stata command, *vselect*, was also used by previous researchers from various field of studies such as by [59], [60]. The second step is to choose the most appropriate static panel data analysis technique. The choice of the most appropriate static technique count upon three types of tests as suggested and outlined by [61]. The tests are F-test, Breusch-Pagan Lagrange Multiplier (LM) test, and Hausman test. The fourth and final step is to perform the diagnostic tests (multicollinearity, heteroscedasticity and serial correlation) and find the correct strategy to rectify the

variables, and therefore, sufficient firm-year observations over the period of five years before financial distress. The five-year period choice is somewhat similar to the study by [62]. The annual reports of the selected firms were obtained from the Annual Companies Handbook (various editions) and the DataStream.

### 3.2 Methodology

The primary objective of this research is to examine the determinants of capital structure. It sets out and forecasts the following baseline regression model for all firms:

$$CS_{it} = \beta_0 + \beta_1CINV_{it} + \beta_2IO_{it} + \beta_3INTANG_{it} + \beta_4TANG_{it} + \beta_5LA_{it} + \beta_6EEG_{it} + \beta_7SIZE_{it} + \varepsilon_{it}$$

$CS_{it}$  = Capital Structure  
 $\beta_1CINV_{it}$  = Changes in Investment  
 $\beta_2IO_{it}$  = Investment Opportunity  
 $\beta_3INTANG_{it}$  = Intangible Assets  
 $\beta_4TANG_{it}$  = Tangible Assets  
 $\beta_5LA_{it}$  = Liquid Assets  
 $\beta_6EEG_{it}$  = Expected Earnings Growth  
 $\beta_7SIZE_{it}$  = Size  
 $\varepsilon_{it}$  = Error term

### 3.3 Data analysis steps

The model of capital structure, as presented in equation (2), is estimated by using the panel data analysis steps as illustrated in Figure 1. The first step is to determine the most optimal combination of predictors. In this study, Stata command, *vselect*, was developed by [63] is used to determine whether certain variable should be included in the model. Following [63], optimal model is defined as the one that optimizes one or more information criteria. Those criteria are Mallow's  $C_p$  (C), Adjusted  $R^2$  (R2ADJ), Akaike's information criterion (AIC), Akaike's corrected information criterion (AICC), and Bayesian information criterion (BIC). This research uses the definitions of these criteria given in [61]. Generally, higher variance which is explained by the model R2ADJ and lower C, AIC, AICC and BIC values indicate the best fitting model [63], [64].

problem(s) identified (if any). The strategy to rectify the problem(s) will be based on the suggestion by [65].

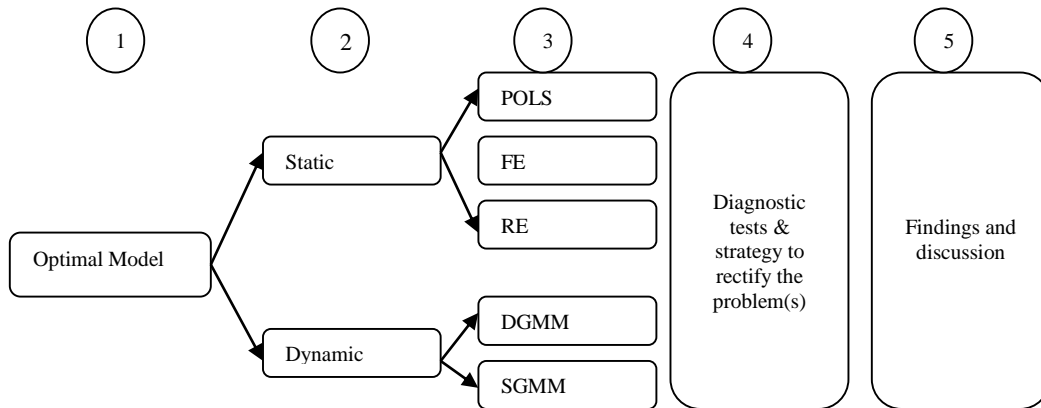


Figure 1: Data analysis steps

**EMPIRICAL RESULTS AND DISCUSSIONS**

The summary statistics of the dependent and explanatory variables over the sample period are presented in Table 1. The mean capital structure, represented by total debt divided by total assets is 51.81% and ranges from a minimum value of -421.71 to a maximum value of 720.24. This signifies the existence of both costs and benefits of financial distress. This means that the performances of

financially distressed firms are 26.61% worst compared to industry sector performance. The findings support the earlier research such as [67] that capital structure is suffered not only by bankrupt firms but also suffered by financially distressed firms prior to their classification as financially distressed. The level of capital structure found is comparable to the research by the previous researchers such as [68] (20.8%), [69] (10% to 20%). The minimum value of -170.84% and maximum value of 113.52% signifies the presence of financial distress costs and benefits.

Table 1: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
Capital structure	215	51.80721	151.6026	-421.71	720.24
Change in investment	215	264.7307	209.7492	5.1	996.36
Investment opportunities	215	.3793023	1.405807	-9.93	.96
Tangible assets	215	-22.30507	176.2992	-905.95	148.32
Intangible assets	215	43.26181	24.73038	.08	95.73
Liquid Asset	215	-14.26912	38.96295	-278.07	67.62

The analysis is carried out by determining the most optimal combination and number of variables to be included in the final model. As shown in Table 2, the choices of the most optimal model predictor size are five. The variables chosen are firm change in investment, investment opportunities, tangible assets, intangible assets and liquid assets. The remaining two variables (expected earnings growth and size) are dropped and excluded from the subsequent analysis. The chosen variables imply the importance of those variables in determining the level of capital structure

for this sample of firms. As expected, the optimal model is different from the previous literature. The difference in the model can be attributed to the choice of different proxy for independent and dependent variable, firms and country specific characteristics, and variable selection techniques.

Table 2: Optimal Models

Optimal models highlighted					
No of predictors	R2ADJ	C	AIC	AICC	BIC
1	.1513936	62.63873	2735.983	3346.24	2742.724
2	.2460936	32.96076	2711.531	3321.865	<b>2721.643</b>
3	.3038532	15.36936	2695.377	3305.808	2708.86
4	.3357637	6.170669	2686.267	3296.815	2703.12
5	.339446	<b>6</b>	<b>2686.046</b>	<b>3296.73</b>	<b>2706.27</b>

Selected Predictors Highlighted	
No of predictors	
1	Investment Opportunity
2	Change in Investment, Investment Opportunity
3	Change in Investment, Investment Opportunity, Tangible Assets
4	Change in Investment, Investment Opportunity, Tangible Assets, Intangible Assets
5	Change in Investment, Investment Opportunity, Tangible Assets, Intangible Assets, Liquid Assets

The next step is to select the most appropriate panel data analysis technique to be employed. The results of the panel specification test as presented in Table 3

suggest that random effects model is the most appropriate data analysis technique.

Table 3: Panel Specification Tests

	F-Test	BP-LM test	Hausman	Appropriate model
p-value	0.0001	0.0001	0.2981	Random effect

The fourth and final step in the data analysis process is to perform diagnostic tests to check the presence of severe multicollinearity, heteroscedasticity and serial correlation problems. As presented in Table 4, the diagnostic checks on the baseline model (FE) indicate

the presence of heteroscedasticity (p-value < 0.05) and serial correlation (p-value < 0.05) problems. To rectify the problems, following the suggestion by [66], remedial procedure has been carried out by using the fixed effect model with the cluster option.

Table 4: Diagnostic Tests

Multicollinearity	Serial Correlation	Heteroscedasticity	Strategy to rectify
Mean VIF = 1.11	p-value = .0000	p-value = 0.0001	Random effect (Cluster)

Since various diagnostic tests and remedial procedure have been conducted, it is more likely to conclude there is enough evidence to show the examined statistical test satisfies the key assumptions of linear regression. As shown in Table 5, the regression result suggests that the model fits the data well at the 1% level. The adjusted R<sup>2</sup> is 35.18%. The results of the regression also suggest that firm change in investment, intangible assets, tangible assets and investment opportunities have a statistically

significant relationship with opportunity costs. From these results, it is apparent that any the increase in change in investment, intangible assets, tangible assets and investment opportunities will increase the level of capital structure. In addition to that, ceteris paribus, change in investment seems to have the greatest influence on the level of capital structure, which is explained by the coefficient value of 25.75% and t statistics of 3.44 (highest value).

Firm change in investment: Firm change in investment has a significant and positive impact on the level of capital structure. One of this arguments supporting a positive relationship between changes in investment and capital structure is provided by [35]. This is because companies are looking for capital when they need to finance investment projects and the investments they make facilitate access to financial markets by strengthening the assurances that they will meet their financial obligations.

Investment opportunities: Theoretically, there should be a significant and positive relationship between the availability of investment opportunities and capital structure. The idea is the availability of good investment opportunities in comparison to its sector could help the firms to alleviate the financial distress costs paid by the firm. This research provides further evidence than the previous researches that there is a significant positive relationship between the existence of alternative investment opportunities and the level of capital structure. One of the arguments supporting a positive relationship between firm's investment opportunities change in investment and the level of capital structure is provided by [40], [70].

Tangible asset: [40], this research found a positive relationship between tangible asset and capital

structure. The positive relationship between tangible assets and capital structure implies that firms may increase the value of their equity by issuing secured debt. The firms with higher tangibility asset are most possibly funding their company through debt financing as tangible assets can be used as debt financing collateral.

Intangible assets: The data found indicate significant and positive relationship between intangible assets and capital structure. However, the previous researches have stated that there is a negative relationship between intangible asset and capital structure compared to tangible assets, which tend to be more difficult to identify, separate and value. Their value is more sensitive to who owns and employs them. This makes many intangible assets poor collateral and favour financing with equity instead of debt [71].

Liquid asset: The result shows the liquid asset has positive relationship with capital structure. This finding provides support for the pecking order theory which suggests that the higher liquid asset business should use its internally generated cash instead of borrowing debt. Our finding is consistent with the result of [34], [72].

Table 5: Regression Results

	Fixed effect with cluster option
Changes in investment	0.2575*** (3.44)
Investment opportunities	29.7265*** (3.40)
Tangible assets	0.2415*** (3.39)
Intangible assets	1.0405* (1.91)
Liquid assets	0.3026 (0.94)
Constant	-62.9461* (-1.66)
Observations	215
F	52.4174***
Adj. R <sup>2</sup>	0.3518

Notes: (1) *t* statistics in parentheses (2) \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## CONCLUSION

The main objective of this research is to provide further evidence on the determinants of capital structure. The method that has been used is static panel data analysis technique. The findings indicate all independent variables have significant relationship between capital structures except for liquid asset. Recommendations for future researchers is to investigate other proxy that was not used in this research in order to increase adjusted R<sup>2</sup> as R<sup>2</sup> is very low in this study. Second, this research did not provide any sectoral analysis on the determinants of capital

structure. Future research should explore whether industry or sectoral classification would have any effects on the capital structure of financially distressed firms and its relationship with selected determinants. Next, this research utilizes Stata command *vselect* in determining the most optimal model. Future researcher might want to use different technique and method of analysis in determining the size and types of variables to be included in the model.

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