

# The Effect of Pyramid Structure on Firm Value

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**Abstract**—Corporate ownership structure is an important factor influencing firm performance. This study aims to answer the question whether pyramid structure has negative effect on firm value. This study is important because the ownership of public listed companies in Malaysia is highly concentrated. The concentrated ownership such as Malaysia, agency conflict is prevalent between controlling shareholders and minority shareholders. Accordingly, the dominant role of shareholders in firms allows the controlling shareholders (including managers) to expropriate the interest of the minority shareholders for their own private advantage. This research is conducted on pyramidal firms in Malaysia. Applying the Attig Model as the underlying statistical test, it is found that firm value is negatively related to pyramid ownership of Malaysian public listed firms due to the mismatch between cash flow rights and control rights. Future research needs to focus on identifying the heterogeneous factors that improve the generalizability of research.

**Keywords**—Pyramid structure, Cash flow right, Control right, Firm value, Attig model.

## I. INTRODUCTION

THIS study investigates the effect of pyramid structure toward firm value among Malaysian public listed firms. A pyramid is defined as a business entity comprising of a group of companies whose ownership structure displays a top-down chain of control. According to [1], a firm is considered as affiliated to a pyramidal structure if it has at least one intermediary firm in its ownership chain. A direct result of the pyramid structure is a separation of actual ownership (cash flow rights) from voting power (control rights), especially for firms placed in the lower level of the structure [2]. Cash flow rights represent a person's actual ownership in a company [3]. Meanwhile, control rights refer to the ratio obtain by dividing the share of control a shareholder can exercise directly or indirectly over a given company by the percentage of shares he actually owns in that company [4]. Logically, the owner's cash flow rights that arise from his actual investment should represent his control rights in the company. However, because of the pyramid structure effect, these two rights may not be equal.

This research is motivated by the phenomenon of highly concentrated ownership in Malaysia companies [5], [6]. Concentrated ownership can encourage the controlling shareholders to expropriate the minority shareholders interest.

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Expropriation occurs when the controlling shareholders use their control rights to maximize their own welfare by taking wealth from another party [7]. This situation causes agency problem between the controlling shareholders and minority shareholders resulting from the former being protected by the control rights and the large difference between these two rights [8].

The separation of both rights exerts a negative effect on firm valuation as confirmed by [9]. It happens because the controlling shareholders have both incentives and opportunities to expropriate minority shareholders [10]. This is one of a number of private control benefits enjoyed by large controlling shareholders at the expense of firm value. The negative relationship between excess control and firm value appears to be stronger when firms are concentrated ownership [11] and when free cash flows are available [10]. It is generally assumed that if governance is weak, then cash flows are likely to be reduced as a result of poor management. This problem is exacerbated for firms with a large discrepancy between the controlling shareholder's voting rights and cash flow rights which, in addition to poor management, are prone to expropriation. *Ceteris paribus*, as firms with concentrated ownership are likely to generate smaller cash flows, they should have lower values.

This study selects Malaysian firms because it has one of the highest numbers of pyramidal firms and also significant tunneling as compared to other countries [12]. Based on the study by [12], they empirically show that the separation of cash flow rights and control rights of the ultimate owner devalue the interest of other shareholders. They conclude that the interest of other shareholders is adversely affected whenever cash flow rights and control rights divergence exists because it enables the ultimate owner to bears only a fraction of the costs from their private benefit activities but receives the full benefit from such ill practices [13]. The consequences of ultimate owner expropriation include highly concentrated ownership [14] and lower firm valuation [15], [3].

Another motivation for this study comes from the findings of [1] which focus on the determinants of pyramid structure besides concern on the dilution of minority interests' issue. Reference [1] analyze a sample of Canadian listed firms and find that there is a mismatch between cash flow rights and control rights in affiliated firms, causing a depressive effect on value as well as diluting minority interests. They also find that the strangled equity holdings of ownership pyramids create a convenient veil for the ultimate owners. This veil, because it is impervious to outside scrutiny, makes it possible to engage in expropriating behavior of minority interests. It seems ultimate owners tend to make pervasive use of opportunistic practices

aim at stripping assets from removed subsidiaries and redeploying cash flows from “affiliated cash cows”.

The current importance of pyramidal ownership structure in the East Asian region encourages this research to examine the determinants of pyramid structure in Malaysia and its effect on firm value. Pyramidal firms have attributes that may distinct them from non-pyramidal firms. Factors such as risk, size, free cash flow, capital expenditure (investment strategy), debt policy, liquidity, duality, financial institution as the second largest shareholder, ratio of cash flow rights over control rights and dividend policy may significantly distinguish pyramidal affiliated firms from others. These determinants may provide some insight on how the pyramidal affiliated firms function. Dilution and ultimate owner misconduct are more obvious within the pyramidal structure than other types of firm [1].

Essentially, this study will ascertain whether the determinants of pyramid structure are similar in Malaysian listed firms as compared to other parts of the world and whether the pyramid structure in Malaysia have the same negative effect on firm value as well as dilution of minority interests. Other than that, this research will provide additional evidence on the structure of ultimate ownership in Malaysian listed companies which is still limited. Until now, researchers in Malaysia are still using immediate ownership to determine the ownership of companies.

Whether the studies by [5], [6] and [1] can be extended to Malaysian listed firms is still an empirical question. Some previous studies done by [16], [17], [13] have touched on the pyramidal structure of Malaysian listed firms in various aspects such as ownership structure, financing, investment, dividend payout; and their findings justify for further aspects to be investigated. Specifically lacking is the effects of pyramidal structure towards firm value.

This study proceeds as follows. The next section describes the research design, empirical model and hypothesis testing. Then, the discussions of results are presented. Finally, the last section provides the conclusion.

## II. METHODOLOGY

### A. Research Design

This study hypothesizes the effects of pyramid ownership structure towards firm value. Sample of pyramidal firms in Malaysia for the period of 1990 to 2010 is identified. Data on cash flow rights, control rights, duality function and financial institution as second largest shareholder are collected at fiscal year ended; excluding those the insufficient information. The research designs incorporate balanced panel approach and estimated the equation using pooled Generalised Least Square (GLS) method to examine the effects of pyramid structure towards firm value. Pyramid firms are selected based on total assets. Data are gathered from Bursa Malaysia Berhad (BMD) and Datastream database, while those for ownership information are manually extracted from firms' annual reports and OSIRIS database.

### B. Empirical Model

The following model as in (1) and (1a) is developed to test the issue whether firm affiliation to pyramidal structure reduces its value. In this model, a dummy variable for pyramidal affiliated firm (PAFF) is included. A number of control variables is also considered to capture the potential dilution effects associated with pyramidal firms in the Tobin's Q regression.

$$TOBQ = \alpha + \beta \underline{L} + \delta * PAFF + \varepsilon \quad (1)$$

$$(TobinQ) = f(Pyramid, Risk, Cash, Size, Capex, DebtR, DivR, Duality, FIH, Liquidity) \quad (1a)$$

Tobin Q or TOBQ is a measure for firm value.  $\underline{L}$  is a set of firm specific control variables. In this model, PAFF is a dummy variable for firm that has an affiliation with pyramidal structure assigned a value of one (1) and zero (0) if otherwise.  $\alpha$ ,  $\beta$  and  $\delta$  are estimated parameters and  $\varepsilon$  is an error term.  $\Delta$  measures the relation between firm's pyramidal affiliations to TOBQ. The expected coefficient signs for the variables studied are shown in the following Table I.

TABLE I  
THE EFFECT OF PYRAMIDAL AFFILIATION ON FIRM VALUE

Variables	Coefficient signs
Pyramidal firm	Negative (-)
Risk	Negative (-)
Cash	Positive (+)
Size	Positive (+)
CAPEX (Capital Expenditure)	Negative(-)
DebtR (Debt ratio)	Positive (+)
DivR (Dividend payout ratio)	Positive (+)
Duality	Positive (+)
FIH (Financial institution holding)	Positive (+)
(Stock liquidity)	Negative(-)

### C. Hypothesis Testing

Prior researches [18]-[21] suggest that the conflicts of interest between large and small shareholders are more pronounced when control right of ultimate owners exceed their cash flow right. Large shareholders whose control right is greater than their cash flow right may have greater incentives to extract value from minority shareholders because this expropriation is less restrained by their own cash flow stake. Reference [6] document that a deviation of ownership from control rights is negatively associated with market valuation, suggesting that the deviation leads to agency costs and thus decreases firm value.

Affiliation to pyramidal firms can be expected to either create or destroy value. A pyramidal structure creates small internal capital market that offers financing, corporate smoothing (corporate activities are undertaken within conglomerates allowing controlling families to increase their wealth at the expense of minority shareholders) and other benefits to affiliated firms. In a diversified pyramidal firm, the capital allocation in financially constrained affiliation can create value. Likewise, the ultimate owners have information advantages and authority that allow them to engage in “winner picking” behavior [22]. This practice of reallocating funds from one affiliate to another either to finance prospective

investment opportunities or to provide collateral to distressed firms may create value even if group-affiliated firms are financially constrained.

However, such benefits might be reaped by the ultimate owners and related parties. Ultimate owners intend to make pervasive use of opportunistic practices aim at stripping assets from removed subsidiaries and re-deploying cash flows from “affiliated cash cows” in favor of tightly held firms. Indeed, the researchers conjectured that the costs associated with the risk of expropriation within pyramidal firms more than offset the attached benefits. Consequently, a value discount for minority shareholders may be associated with this pyramidal ownership. Therefore, the hypothesis can be explicitly formulated as follows:

H1. Pyramidal affiliated firms have negative effect on firm value.

### III. RESULTS AND DISCUSSIONS

#### A. Data Description

Controlling shareholder is a shareholder who has the largest control rights at certain cut off of control rights. Someone is referred as the controlling shareholder if he only has the largest control rights among some shareholders at certain cut off. So, this study uses cut off 10% and 20% of control rights. Based on Table II, the amount of increased control rights from cash flow rights appears in the variable cash flow rights leverage (CFRL). CFRL represents the difference between control rights and cash flow rights. The results show that the average t-value increased control or CFRL amount to 16.995% at a cut off 10% which is highest as compared to 16.865% at a cut off 20%. The significant value of cash flow rights leverage (CFRL) at cut off 10% and 20% of control rights (CR) differ significantly from zero. The difference is significant as the t-value is large and the probability of t is less than 0.05. Furthermore, the findings of this study indicate that the mechanism most widely used by controlling shareholders to increase its control through the pyramid at cut off 10%. The results are consistent with [21], [2], [14], [23].

TABLE II  
ONE-SAMPLE TEST

Cutoff Variable t	Sig. Mean Difference (2tailed)
10% CFRL 16.995	0.000 13.082
20% CFRL 16.865	0.000 12.982

These results also show that agency problem is serious and have a concentrated ownership structure at cut off 10% of control rights. The concentration will cause a separation between cash flow rights and control rights. In fact, the phenomenon of corporate ownership in Malaysia is concentrated. Therefore, majority agency problem in Malaysia is between controlling shareholder and minority shareholders. Agency problem may be more serious when managers of company are the family of controlling shareholder [24]. The issue of separation of ownership (cash flow right) and control (control right) can be illustrated in the case of Malaysian Corporation. Based on the study by [25], in the pyramid

group, ultimate owner has a direct ownership of Firm A only. For the rest of the firms, the ownership comes indirectly. For instance, Ultimate owner's ownership in Firm B comes through Firm A. For Firm C, ultimate owner's ownership arises from his share in Firm A and Firm B. Resulting from this particular arrangement, ultimate owner's actual ownership (CFR) in Firm C is small.

#### B. Model Affiliation of Pyramidal Firms to Firm Value

Table III shows the result of regression analysis for the effect of pyramidal affiliation on firm value. The results indicate that pyramidal firms have a negative relationship with firm value which is statistically significant at 1% level. The negative effect means that higher pyramid ownership provides the controlling shareholder with more opportunity and incentive to expropriate firm's resources at the expense of minority shareholders. The results support the expropriation hypothesis and consistent with the findings by [26], [27].

Firm's size records significantly positive relationship with firm value at 1% level, consistent with [28] and [29] findings. A bigger firm can perhaps devise better ways and means to fight the market risks and uncertainties, have better chances to offset random losses [30]. Firms endowed with larger free cash flows display a higher probability of pyramidal affiliation which leads to severe agency problem. Such firms (cash cows) might satisfy the cash preference of the ultimate owners [1].

For capital expenditure, it gives negative effect towards firm value. In this case, the coefficient for capital expenditure is significantly negative at 1% level. Dividend payout ratio and debt ratio are positively significant relationship with firm value at 1% level. Higher dividend will give the impression that the ultimate owner does not keep larger total of retained earnings that can be expropriated later for the benefits of ultimate owner. Debt has positive effect towards firm value which means that firms are able to borrow externally. According to [31], pyramidal firms with good corporate governance may find it easier to issue debt.

Risk is negatively related to firm value. Results for this model show that in Malaysia, risk has positive relation with firms' affiliation to pyramid structure and these results conform to [1] findings that pyramidal affiliation may be associated with value discount. Pyramidal firms may destruct value since minority shareholders might not share equally in the benefits of affiliation. Ultimate owners, mostly families, tend to make pervasive use of opportunistic practices that strip assets from subsidiaries and re-deploy cash flows from “affiliated cash cows” in favor of tightly held firms to insure private benefits. Therefore, pyramidal ownership depresses firm value of affiliated firms.

The other findings by [2], [32]-[35] report that group pyramidal holdings are associated with expropriation of minority shareholders, tunneling of cash flows and suboptimal decision making. Hence, it can be conjectured that minority shareholders face costs that link to expropriation risk which can more than offset the benefits that come with such pyramidal affiliated firm. As a result, pyramidal affiliated firm

is associated with a value discount which particularly also give negative effect for the minority shareholders.

Meanwhile, in Malaysian scenario, the potential of expropriation is high when the function of owner and manager is united. The result of the regression shows that Malaysian firm value is lower when the owners of the firms are not independent [36]. The effect of pyramidal structure on firm value can be observed more pronounced when they are segregated into high CFR ratio firms and low CFR ratio firms (Tables IV and V respectively). The ratio is derived from the cash flow rights over control rights.

Besides that, stock liquidity also has negative effect on firm value. Stock liquidity significantly correlates negatively with pyramidal firm at 1% level; given that small investors are alert to dilution that they will avoid stocks of firms where the risk of private benefit extraction is large. It means that the lower the stock liquidity of the firm, the higher probability the firm is affiliated to pyramidal firms. This result supports the study by [37] who said information flows in pyramidal firms are more distorted.

TABLE III  
RESULT OF REGRESSION ANALYSIS (MODEL: FIRM VALUATION)  
(DEPENDENT VARIABLE: TOBIN Q)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PF	-0.139106	0.054368	-2.558630	0.0106***
Risk	-0.348095	0.179632	-1.937822	0.0529**
Cash	0.003306	0.010064	0.328478	0.7426
Size	0.070217	0.011956	5.872990	0.0000***
CAPEX	-0.178782	0.062067	-2.880489	0.0040***
Debt Ratio	0.745349	0.027750	26.85967	0.0000***
Div. Ratio	0.060664	0.022542	2.691185	0.0072***
Duality	0.097442	0.053008	1.838243	0.0663
Fin. Inst	0.020238	0.021099	0.959229	0.3376
Liquidity	-0.016179	0.005905	-2.739658	0.0062***
Weighted Statistics				
R-squared	0.290118	Mean dependent var	0.690405	
Adjusted R-squared	0.279781	S.D. dependent var	1.189985	
S.E. of regression	0.982123	Sum squared resid	512.1848	
Durbin-Watson stat	1.934866			

\*significant at 10%, \*\*significant at 5%, \*\*\*significant at 1%

Table IV demonstrates the result of analysis of model for the high CFR ratio firms. However, only four variables are significant which are size, capital expenditure, duality and stock liquidity. For size and liquidity, these variables are significantly negative at 5% and 1% levels respectively. It means that high CFR ratio firms which are smaller and less liquid tend to have higher firm value. It can be conjectured that even though high CFR ratio firms in Malaysia can be smaller in size and less liquid, but they can still perform well.

For capital expenditure and duality, the coefficients show significantly positive at 1% level. The results suggest that higher capital expenditure and duality leads to higher firm value of the firms. For high CFR ratio firms, the results is true because the issue separation of actual ownership and control as well as agency problems are less in these firms and the firms can easily made investment for firms' growth without worrying for the ultimate owner intentions of expropriation.

Meanwhile, the duality function of the owner actually helps high CFR ratio firms to make proper decisions on firms' operations especially during crisis period [36].

TABLE IV  
RESULT OF REGRESSION ANALYSIS (MODEL: HIGH CFR RATIO)  
(DEPENDENT VARIABLE: TOBIN Q)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PF	0.163089	0.127625	1.277879	0.2024
Risk	-0.311061	1.235389	-0.251792	0.8014
Cash	0.015010	0.021138	0.710079	0.4783
Size	-0.037148	0.018583	-1.998986	0.0466**
CAPEX	1.645116	0.080308	20.48498	0.0000***
Debt Ratio	0.316429	0.223774	1.414055	0.1585
Div. Ratio	-0.001749	0.006183	-0.282840	0.7775
Duality	0.324107	0.132734	2.441778	0.0153***
Fin. Inst	-0.037326	0.100251	-0.372326	0.7099
Liquidity	-0.634315	0.083470	-7.599345	0.0000***
Weighted Statistics				
R-squared	0.270990	Mean dependent var	0.775679	
Adjusted R-squared	0.251108	S.D. dependent var	1.203877	
S.E. of regression	0.981058	Sum squared resid	317.6165	
Durbin-Watson stat	1.908019			

\*significant at 10%, \*\*significant at 5%, \*\*\*significant at 1%

Table V presents the results of regression analysis which focus on low CFR ratio firms. The low CFR ratio firms open up possibilities for the ultimate owner to conduct wealth expropriation or rent-seeking behavior which leads to agency problems [2]. The results reveal that only pyramidal firm, size, capital expenditure, debt ratio, dividend payout ratio, duality and stock liquidity are significantly related to firm value at 1% level. For the variables such as size, debt ratio, dividend payout ratio and stock liquidity are significantly positive related to the firm value at 1% level whereas capital expenditure and duality variables are significantly negative related to firm value at 1% level. Low CFR ratio firms' analysis results are more conclusive and in line with the prior literature of pyramidal structure effect on firm value.

For instance, the results show that low CFR ratio firms are underperforms due to the separation of cash flow rights and control rights of the ultimate owner which devalue the firm value and the interest of other shareholders [1]. This finding is supported by [38] who also provide similar findings that firm devaluation is more apparent in low CFR ratio firms. It is because endowed with a motive due to non-matching significant control rights with lower cash flow rights, the ultimate owner proceeds to entrench and pursue private benefits at the expense of minority shareholders interests [2]. Firms with less capital spending are unable to perform well probably because they over invest to fulfil the intention of ultimate owner utility function such as empire building. There is a negative relationship between duality and firm value for low CFR ratio firms, where the duality functions as owner and also manager may have lower value rather than those firms with separate owner-manager function. Thus, it can be concluded that the effect of pyramidal firm towards firm value

is more observable in low CFR ratio firms compared to high CFR ratio firms.

TABLE V  
RESULT OF REGRESSION ANALYSIS (MODEL: LOW CFR RATIO)  
(DEPENDENT VARIABLE: TOBIN Q)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PF	0.674240	0.150079	4.492568	0.0000***
Risk	-4.762557	3.802597	-1.252448	0.2140
Cash	-0.025208	0.051088	-0.493416	0.6230
Size	0.160493	0.051544	3.113719	0.0025***
CAPEX	-0.606385	0.231441	-2.620042	0.0105***
Debt Ratio	0.966493	0.007818	123.6230	0.0000***
Div. Ratio	0.114842	0.043938	2.613736	0.0107***
Duality	-0.661693	0.059274	-11.16332	0.0000***
Fin. Inst	0.133394	0.082517	1.616556	0.1098
Liquidity	0.209282	0.061831	3.384719	0.0011***
Weighted Statistics				
R-squared	0.288502	Mean dependent var	1.300336	
Adjusted R-squared	0.274799	S.D. dependent var	1.070549	
S.E. of regression	0.924152	Sum squared resid	162.2706	
Durbin-Watson stat	1.939339			

\*significant at 10%, \*\*significant at 5%, \*\*\*significant at 1%

#### IV. CONCLUSION

A lot of studies have been carried around the world on pyramidal firms and performance, but yet little research done in Malaysia. Thus, the objective of this study is to examine the effect of pyramid structure on firm value. Overall, the findings provide evidence that pyramid structure reduce the firm value. The results of analysis depict the variables such as pyramidal structure, risk, size, capital expenditure (CAPEX), debt, dividend payout ratio and liquidity are among the factors that significantly affect the firm value as well as the dilution of minority interest at 1% and 5% significance level respectively. The effect of pyramidal firms on firm value is more pronounced when the pyramidal firms are segregated into high CFR ratio firms and low CFR ratio firms. For high CFR ratio firms, only four variables are significantly related to firm value. These variables are capital expenditure, duality, stock liquidity and size. As for the low CFR ratio firms, the variables such as pyramidal firm, size, capital expenditure, debt ratio, dividend payout ratio, duality and stock liquidity posit significant relationship with firm value. The other three variables such as risk, cash and financial institution holding as second largest shareholders are insignificant. The findings imply that for low CFR ratio firms, there is a possibility for the ultimate owner to create private benefit for self-interest without concern to the minority shareholders interests. It is vital to regulate Malaysian public listed firms for disclosing ownership of the firm until the ultimate ownership. So, it will assist the minority shareholders to measure the risks that they possibly bear. Thus, regulators and investors should be sensitive on this matter. It is because pyramidal firms practice different set of strategies and have high degree of ownership concentration. So, the next research needs to provide a more comprehensive evidence and diagnose the prevalent of pyramid structure emergence in a highly concentrated

ownership environment specifically in Malaysia besides extend the pyramid firms in other countries to provide better generalization.

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