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Investment, Board Governance and Firm Value: A Panel Data Analysis[1]

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This study investigates firm valuation effects of investment expenditures in a sample of 361 non-financial Malaysian listed firms over the 2002-2007 period. The results of the fixed effect regression runs on a balanced panel data indicate insignificant impacts of investment and its squared term. Given the low level of investment, the findings suggest a symptom of underinvestment among sample firms, particularly when dividend policy is found to have a significant positive impact on firm's Q. Increasing Q accompanied by decreasing investment, increasing dividend and stagnant debt ratio seem to suggest that such an underinvestment is the results of management choosing only safe investments while distributing excess cash to shareholders for sure returns. In the meantime, board governance generally has the expected direct and moderating roles in firm valuation particularly when role duality is concerned.

Field of Research: Corporate Finance, Corporate Governance

1. Introduction

Even prior to the tax benefit incorporation in capital structure theory, Modigliani and Miller (1958) have firmly argued that firm value is a function of investment as firm's profitability evolves in response to its investment policy (Brennan & Schwartz, 1984). Despite the emphasis given on the significance of investment to firm valuation, such studies remain sparse (Chung et al., 1998). For the existing studies on the investment-value relationship, citations normally begin with the work of McConnell and Muscarella (1985). Their results indicate that for industrial firms, the markets respond favorably to investment announcements and negatively to divestment announcements.

Chung et al. (1998) argue and prove that the investment-value relationship does not depend on industry affiliation, rather it depends on the quality of the investment opportunities. Morgado and Pindado (2003) take a different approach in examining the relationship by putting forward overinvestment/underinvestment hypothesis. They

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argue that there exists an optimal investment level which influence is very much similar to capital structure. The investment-value relationship is not infinitely monotonic as an increase in investment creates value as long as it is associated with a positive NPV but once the quality assets are exhausted, firm value deteriorates. Using an unbalanced panel data of 135 non-financial Spanish firms over the 1990-1999 period, they prove this conjecture when the coefficient of investment is significantly positive whereas the coefficient of the quadratic term of investment is significantly negative.

In addition to providing additional evidence on the impact of capital expenditure on firm performance from a different setting of an emerging market, the present paper contributes to the existing literature by incorporating other crucial financial decisions including financing and payout as well as the direct and indirect effects of board governance in determining the impact of investment on firm performance. The paper proceeds as follows. In Section 2, related literature is reviewed and hypotheses are developed. Sections 3 and 4 present the methodology and empirical results, respectively whereas section 5 concludes.

2. Literature Review

The impact of investment on firm value or performance has been examined in a number of studies. For instance, McConnell and Muscarella (1985) who study the impact of announcements of planned capital investments on share prices generally find a positive association between those announcements and abnormal returns. The positive association is again discovered in Chung et al. (1998) but conditional on the quality of the investment projects rather than industry affiliation. Baker et al. (2003) in the meantime show that such a positive impact depends on the method of payment for the investment. Specifically, firms that use equity to finance investment generally see negative future returns. The findings of Titman et al. (2004) suggest that future excess return pattern depends on past investment activity. Specifically, excess returns are positively (negatively) associated with low (high) investment activities. However, when the association is examined during the high takeover period (1984-1989) defined in the Holmstrom and Kaplan (2001), the negative association disappears. They interpret this as evidence that capital market participants are effective in mitigating the empire-building tendencies of management.

The positive impact of investment on firm value may not materialize in the presence of agency conflicts (Jensen & Meckling,1976). Managers may choose to spend costly capital on low-risk projects, thereby reducing the present value of those projects. Managers may also choose to forego investments in positive present value projects due to management risk- or effort-aversion. Management's risk aversion is a source of agency costs (Easterbrook, 1984) because by choosing "safe" investments, managers can mitigate loss of employment as well as loss of wealth tied up in firm stock as a consequence of subsequent poor performance, or in the extreme, bankruptcy. Whether the management pays for these "safe" investments through more costly capital or underutilized free cash, the present value of the project is reduced, leading to a decrease in firm wealth. Other contributors to residual loss include management perquisite consumption and increased compensation associated with empire building (Murphy, 1985). Other than

investment, this study also incorporates other crucial financial decisions specifically financing, dividend and free-cash-flows policies and profitability.

With regard to board governance, researchers have investigated the usefulness of a board of directors as a monitoring devise as it communicates the shareholders' objectives and interests to managers. Three of the board governance facets are of interest to this study, namely board independence, role duality and size. The main argument for maintaining a certain degree of independence in the board composition is that an external board membership ensures proper management supervision and limit managerial opportunism (Munter & Kren, 1995). Empirical studies have found that increased outsiders on the board are likely to promote decisions that are in the interests of external shareholders (Brickley et al., 1997; Weisbach, 1988). Evidently, stock market reacts favorably to the appointment of additional outside directors (Rosenstein & Wyatt, 1990). This positive role has been challenged by managerial hegemony theory which views directors as passive instruments (Kyereboah-Coleman & Biekpe, 2006/2007; Coles et al., 2008).

Next is role duality which occurs when the same person undertakes both the roles of the company's board chairman and chief executive officer. This study takes the stance of Dahya et al. (1996) and Kyereboah-Coleman and Biekpe (2006/2007) in arguing that giving too much power to one person is undesirable as it can create problem in controlling the decision making process. In other words, separating the two critical positions in the company is necessary to reduce agency costs. This hypothesis is also consistent with the recommendations of the Malaysian Code on Corporate Governance (Finance Committee on Corporate Governance, 2001) to separate the roles of the Chairman and CEO.

The last facet is the board size, which refers to the number of directors who serve in a firm's board. Agency models suggest that large boards may destroy corporate value. In 348 Australian largest listed companies, Kiel and Nicholson (2003) find evidence which contradicts theoretical prediction as board size is found to have a positive impact on market-based firm performance. Their finding however may be explained by the size of the board of the studied firms which is approaching the normative best practice guidelines. This study is also interested to examine the indirect impact of board governance on firm value through its interaction with investment. This is due to the fact that it is the directors who communicate the shareholders' objectives and interests to managers, implying that to a great extent the former has influence on the major decisions made by latter, including those involving investments.

3. **Methodology**

To investigate the impact of investment and board governance on firm performance, this study uses yearly data of 361 non-financial firms that are consistently listed on the Main Board of Bursa Malaysia for the period from 2002 to 2007. The data includes book value of total assets and total debt, market value of equity, dividend per share, earnings before interest and taxes, interest, depreciation and tax expenses, sales and operating cash flows. Also collected for this study is data concerning the firm's Board of Directors. Data is sourced from Thompson's Datastream and annual reports. The structure of the panel, by number of annual

observation over the 6 years period per company, yields a total of 2166 yearly firm observations. Market timing (high equity and thus low debt in good market condition) (Elliot et al., 2008) is not really an issue in this study as it covers period of tranquility after the market is relatively free from the Asian 1997 financial crisis. For the same reason, this study chooses 2002 as it cut-off point to minimize any value disruptive events such as a prolonged restructuring process due to the crisis.

This study measures value of firm *i* at time *t* using Tobin's Q which is:

$$Q_{i,t} = \frac{MV(Equity)_{i,t} + BV(Total\ Debt)_{i,t}}{BV(Total\ Asset)_{i,t}} \quad (1)$$

Investment decision's influence on the firm value is examined by estimating the impact of increment of the investment (*INV*) undertaken by a company;

$$INV_{i,t} = \ln\left(\frac{Total\ Asset_{i,t}}{Total\ Asset_{i,t-1}}\right) \quad (2)$$

The optimal level of investment is estimated by the coefficient of *INV* squared.

The three facets of board governance are as follows;

Duality roles: *BDUA* is a dichotomous variable which takes a value of 1 if the chief executive officer (CEO) is also the Chairman of the BOD and zero otherwise.

Level of independence: *BIND* is the total number of independent (outside) non-executive directors.

Size : *BSIZ* is the natural log of the total number of directors in the Board.

The impacts of 4 other variables which in the literature are widely accepted as having large impact on performance are defined as follows;

$$DPS_{i,t} = \frac{Dividend_{i,t}}{Shares\ Outstanding_{i,t}}, \quad (3)$$

$$LEV_{i,t} = \frac{BV(Total\ Debt)_{i,t}}{BV(Total\ Asset)_{i,t}} \quad (4)$$

$$FCF_{i,t} = \frac{(EBIT + Depreciation - Interest - Tax - Dividend)_{i,t}}{BV(Total\ Asset)_{i,t}}, \quad (5)$$

$$PROF_{i,t} = \frac{Operating\ Cash\ Flows_{i,t}}{Sales_{i.t}}, \quad (6)$$

where *DPS* is the dividend per share, *LEV* is leverage, *FCF* is free cash flows, *EBIT* is earnings before interest and taxes, and *PROF* is profitability.

This study employs the fixed firm effect regression model which controls for time-invariant heterogeneity to estimate the relationship between investment and firm value;

$$Q_{i,t} = \alpha_{i,t} + \beta_1(\Delta INV)_{i,t} + \beta_2(\Delta INV^2)_{i,t} + \beta_3(DPS)_{i,t} + \beta_4(LEV)_{i,t} + \beta_5(FCF)_{i,t} + \beta_6(PFT)_{i,t} + \beta_7(BIND)_{i,t} + \beta_8(BDUA)_{i,t} + \beta_9(BSIZ)_{i,t} + \varepsilon_{i,t} \quad (7)$$

where α is the regression intercept, β_1 to β_9 are the coefficient estimates of the respective independent variables which definitions are represented in Eq.(1) to Eq.(6) and in board governance variable descriptions.

To examine whether investment decisions follow the strict shareholders' value maximization rule or are also influenced (or moderated) by the board's sentiment, Eq. (7) is then modified to include interaction terms;

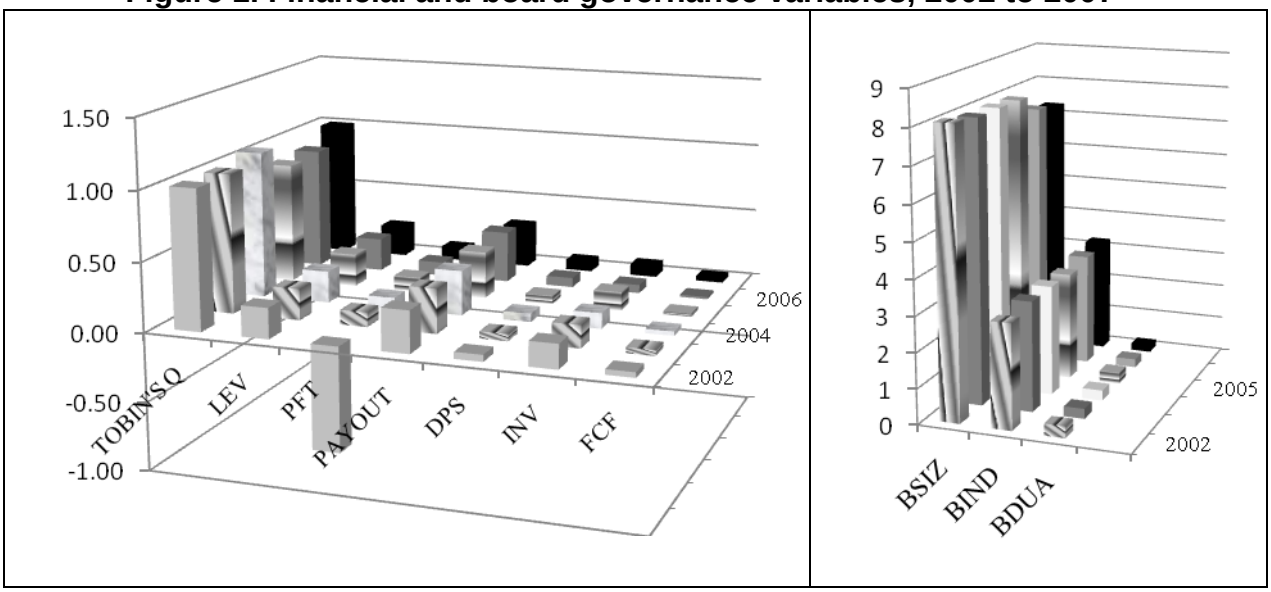
$$Q_{i,t} = \alpha_{i,t} + \beta_1(INV)_{i,t} + \ldots + \beta_9(BSIZ)_{i,t} + \beta_{10}(INVxBIND)_{i,t} + \beta_{11}(INVxBDUA)_{i,t} + \beta_{12}(INVxBSIZ)_{i,t} + \varepsilon_{i,t} \quad (8)$$

where *INVxB…* are the interactions between investment and board governance variables while the remaining variables are as defined in Eq.(7).

4. Discussions of Findings

Figure 1 exhibits the trends in the variables throughout the period from 2002 to 2007 to illustrate the descriptive statistics reported in Table 1. Tobin's Q values consistently remain close to 1 with an average of 0.9753, indicating that in most years, the firms' market values are slightly lower than their book values. Unlike Q, investment seems to be declining rather consistently with a low average of 0.0499 (natural log, correspond to about 5% actual growth). Dividend per share remains around 6 cents which corresponds to about 32.83% payout ratio. Leverage is also stable and remain around 23.02%, consistent with results found in earlier studies (cf. Krishnan & Moyer, 1997; Deesomsak et al., 2004). This relatively low debt usage could be partly due to the small debt capital market in Malaysia. The fact that 86 percent of the Malaysian listed firms are Shariah-compliant (Shariah Advisory Council, 2007), which implies that these firms must abide to the 33 percent maximum debt ratio, could also be the other explanation behind the low leverage. In this study, 77.87 percent of the studied firms are Shariah-compliant. Profitability is stable and low but pulled down to a -4.5% average by the huge losses reported in 2002 (-75.58%). Similarly are free-cash-flows which average 3.08% over total assets. The negative profits and free-cash-flows explain the low investment but interestingly they do not explain the high dividend payout practiced by these firms. We therefore take the stand that it is the market appeals (maintaining DPS) rather than the future growth (payout) which gain more management concern.

Figure 1. Financial and board governance variables, 2002 to 2007



Similarly, the board governance variables indicate no particular change over the 6 year study period. In details, Malaysian listed companies have on average 8 directors, which is within the size recommended by Lipton and Lorsch (1992) for board effectiveness. The average total numbers of independent non-executive directors of is 3.12 which could be attributed to the implementation of the MCCG 2001 which requires at least one-third of the directors to be independent directors. Alternatively, these companies could be loss-making companies (negative profit in 2002 and still recovering from the 1997 crisis) that tend to appoint more independent directors as part of their restructuring process. Additionally, the number of firms with role duality is relatively low and declining with an average of 27.7%, consistent with the recommendations of the MCCG 2001 to separate the roles of the Chairman and CEO.

Table 1. Descriptive statistics

Variables	Mean	Median	Minimum	Maximum	Std Dev
Tobin's Q	0.9753	0.7249	15.3057	0.0404	1.1187
Investment (*INV*)	0.0499	0.0399	3.7188	-3.9267	0.3127
Leverage (*LEV*)	0.2302	0.2041	2.9163	0.0000	0.2096
Dividend (*DPS*)	0.0604	0.0220	2.5720	0.0000	0.1673
Free-Cash Flows (*FCF*)	0.0308	0.0378	1.3845	-2.5964	0.1346
Profitability (*PFT*)	-0.0452	0.0852	2.8371	-310.08	6.6744
Role Duality (*BDUA*)	0.2770	0.0000	1.0000	0.0000	0.4476
Independence (*BIND*)	3.1163	3.0000	8.0000	0.0000	0.9939
Board Size (*BSIZ*)	7.7993	8.0000	20.0000	2.0117	2.2304

Note: All Jarque-Bera statistics are significant at 1% level. Throughout N = 2166 observations.

The results of the regressions of firm valuation (Tobin's Q) on investment, board governance and control variables are reported in Table 2. In general, the F-statistics for both models are significant at the 1 percent level, consistent with the high goodness-of-fit (R^2 > 85%). The direct model shows that investment has a positive coefficient, consistent with the theoretical argument. However, the coefficient is not significant. The fact that the investment square (INV^2) is also positive and

insignificant indicates the none existence of optimal investment level. This result suggests that even though investment can have a positive influence on value, it is not high enough to make a significant difference (recall that investment in these firms are only 5%). The impact of investment on firm performance is even more ambiguous when the interaction effect of board governance is introduced in the interaction model. Coupled with the negative INV^2, the negative coefficient on *INV* suggests that firms that spend their cash on investment are more likely to see their values suffer. The results on other financial variables are mixed but consistent with the theoretical predictions in the case of dividend and leverage. Counterintuitive are the impact of free-cash-flows (+ve) and profitability (-ve) on firm value.

Table 2. Results of fixed effect regressions, 2002 to 2007

Independent Variables	Direct Model (Eq.(7))		Interaction Model (Eq. (8)	
	Coefficients	t-statistics	Coefficients	t-statistics
Intercept	0.8624	40.2310**	0.8424	32.0209**
Investment				
Investment (*INV*)	0.0021	0.1740	-0.1406	-1.4512
Optimal investment (INV^2)	0.0036	0.3347	-0.0013	-0.1047
Board Governance				
Role Duality (*BDUA*)	-0.0306	-4.5311**	-0.0326	-4.4563**
Independence (*BIND*)	0.0019	0.5168	0.0020	0.5228
Board Size (*BSIZ*)	-0.0304	-3.4616**	-0.0193	-1.6095
Other Financial Control Variables				
Leverage (*LEV*)	0.4513	15.2031**	0.4428	14.8891**
Dividend Policy (*DPS*)	1.1889	12.6047**	1.1973	12.6826**
Free Cash Flows (*FCF*)	0.0221	0.4717	0.0129	0.2760
Profitability (*PFT*)	-0.0003	-0.9273	-0.0003	-0.7996
Interaction Variables				
INV x *BDUA*			0.0786	2.5292*
INV x *BIND*			0.0215	1.5395
INV x *BSIZ*			0.0223	0.4682
Weighted Statistics				
Adjusted R^2		0.8758		0.8562
S.E.Regression		0.6870		0.6808
Durbin-Watson		1.6694		1.6610
F-Statistics		42.3856		35.6694
Prob(F-Statistics)		0.0000		0.0000

Notes: Symbols ** and * indicate significance at 1% and 5% levels, respectively.

With respect to the board governance variables, their signs indicate roles that are consistent with the theoretical intuition. The significant negative impact of role duality correctly suggests that a separation in the management and board leadership is necessary to reduce the potential for agency conflicts. The positive role of independent directors is also consistent with theoretical prediction, but it is insignificant. The significantly negative coefficient of board size meanwhile suggests that while having a separate board leadership does matter much in influencing firm performance, so does having a small number of directors involve in decision making.

Taken together, the negative *INV* is rather convincingly a symptom of underinvestment among sample firms, particularly when the dividend policy is found

to have a significantly positive impact of firm's Q. Increasing *Q* accompanied by decreasing *INV* and increasing *DPS* as well as a stagnant debt ratio seem to suggest that such an underinvestment is the results of management choosing only safe investments (Easterbrook 1984) and distributing excess cash to shareholders for sure returns. This is particularly evident based on the results from the interaction model which suggest that certain characteristics of the board governance cause firms' performance to suffer when firms spend on investment. Given that the change in the direction and strength of the coefficient of investment is rather material, the results so far are sufficient to suggest that there exists a moderating effect of board governance on the investment-performance relationship.

5. Conclusion

This paper examines the impact of investment and board governance on firm valuation in a sample of 361 non-financial Malaysian firms over the study period from 2002 to 2007 which creates a total of 2166 yearly observations on a balanced panel data basis. The preliminary results indicate a period of safe business strategies where underinvestment is compensated by distributing cash to shareholders and maintaining debt levels. The fixed effect regression results provide strong supports to the management risk-averse inclinations toward the safe investments as insignificantly positive (direct model) and negative (interaction model) effects of investment on value are coupled with significantly positive impacts of dividend and leverage. This finding suggests that shareholders give their blessing to management's safe strategy, by appreciating the sure cash over future unpredictable prospects of investments. Overall, the results of this study may be surmised to suggest that firm value increases through reduction of agency costs *via* monitoring mechanism entailed in debt covenants (especially when banks are the main source of debt capital) and implementing safe investment strategy (by avoiding risky investments) which simultaneously ensures excess cash is distributed to shareholders.

This study has two major limitations that need to be acknowledged and accordingly addressed in future studies. Firstly, the investment-value relationship established in this study has not taken into consideration other factors such as the quality and payment method of investment. Secondly, since the sample is limited to large listed firms, the findings cannot be generalized to explain the impact of investment undertaken by smaller firms.

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