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Do Family-Controlled Malaysian Firms Create Wealth for Investors in the Context of Corporate Acquisitions?

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Abstract: Evidence has proved that family-controlled firms are prevalent in Malaysia and do exert considerable economic power in the country. Two possible scenarios emerge when ownership of firms become concentrated in the hands of only a few shareholders or a group of related shareholders. Firstly. the interests of related shareholders could be aligned with other non-family shareholders (Agency Problem I). Conversely, there is a possibility that related shareholders could treat themselves preferentially over the minority shareholders (Agency Problem II). Given that the ownership structures of the majority of Malaysian publically listed firms are characterised by concentrated shareholdings, protection of the interests of minority shareholders becomes critical. However, beyond anecdotal evidence, there is little empirical evidence on the relevance of minority expropriation activities to Malaysian family-controlled firms and firm value. This study investigates the corporate acquisition activities of family-controlled Malaysian firms. Corporate acquisitions are amongst the high profile corporate investment mechanisms that provide a direct measure for possible expropriation of shareholder funds or value-enhancing activities. This study used classical event study methodology to examine the wealth created by corporate acquisition activities of family-controlled Malaysian firms. The findings of this study found that whilst family ownership improved firm value, it could be destructive if power is entrenched by a few. The implications, especially for Malaysian policy makers, include determination of additional corporate governance framework and governmental effort to hinder concentrated family ownership in family-controlled firms. As highlighted by OECD (*The Star*, 2013), poor enforcement of corporate governance compliance requirements remains an issue for Malaysia.

Key words: Corporate acquisitions, cumulative abnormal returns, event study methodology, family firms, Malaysia
JEL classification: G34

1. Introduction

Family-controlled firms, as a unique form of corporate governance structure, are prevalent in the global capital markets worldwide (Carney & Child, 2012; La Porta *et al.*, 1999). Family-controlled firms also exert substantial influence over the economic landscapes of most nations (Alderson 2011; Astrachan and Shanker 2003; Poza 2009; Pricewaterhouse-Coopers 2012). The contribution of family-controlled businesses to the overall economic growth, especially in Asia, is predicated to grow successfully (Tong 2009).

Given the importance of such firms and the influence of the controlling family, the field of family-controlled business research has been receiving increasing scholarly attention in recent years. Empirical evidence demonstrates that family-controlled firms significantly

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differ from non-family-controlled firms across different dimensions. These dimensions include: corporate governance structure (Siebels and Dodo, 2012); family goals; family culture; trans-generational features; and the business strategic decision making process (Aguilera and Crespi-Cladera 2012; Anderson and Reeb 2003; Chrisman *et al.* 2012; Chua *et al.* 2009; Lin 2012; Sharma *et al.* 2012; Sirmon and Hitt 2003).

Ownership and management in family-controlled firms are typically intertwined (Carney and Child 2012; Claessens *et al.* 2000; Lins 2003; Thillainathan 1999; World Bank 2005). The controlling family often holds a dominant ownership stake in the company and is also involved in the management of the company. Consequently, it is the controlling family that shapes the internal and external dynamics of family-controlled firms. The strong influence of the controlling family on the success and failure of family-controlled firms cannot be overlooked (Bennedsen *et al.* 2007) due to factors such as: ownership structure (Carney and Child 2012; La Porta *et al.* 1999; Claessens *et al.* 2000; Lins 2003); board structure (Anderson and Reeb 2004); corporate governance structure (Aguilera and Crespi-Cladera 2012); corporate investment policy (Anderson *et al.* 2012; Block 2012); and succession plans (Bennedsen *et al.* 2007).

One traditional way of examining performance of family-controlled firms is based on the accounting of their financial performance.[2] Another way of examination looks at the performance of family-controlled firms' execution of strategic corporate investments. Specifically, the market performance of family-controlled firms is examined when they perform corporate acquisitions (Bauguess and Stegemoller 2008; Bhaumik and Selarka 2012; Bouzgarrou and Navatte 2013; Caprio *et al.* 2011; Shim and Okamuro 2011). Any positive market appraisal of family-controlled firms subsequent to the announcement of corporate acquisition activities is termed as the 'wealth effect'.

Existing studies of family-controlled firms and wealth effect of corporate acquisitions reveal a contrast with studies on general corporate acquisition (Bauguess and Stegemoller 2008; Bhaumik and Selarka 2012; Caprio *et al.* 2011; Shim and Okamuro 2011). Past corporate acquisition literature suggests that acquiring firms (the acquirers) generally experienced insignificant wealth effect due to corporate acquisition announcements (Alexandridis *et al.* 2010; Campa and Hernando 2004; Martynova and Renneboog 2008; Tuch and O'Sullivan 2007). In other words, the corporate acquisition decisions of the acquirers do not result in significant changes to the acquirers' market value. However, this is not the case for family-controlled firms. Studies show that acquirers that are family-controlled firms experience significant changes in market value (both positive or negative) when announcing their corporate acquisition decisions (Bauguess and Stegemoller 2008; Bhaumik and Selarka 2012; Caprio *et al.* 2011; Shim and Okamuro 2011).

A dominant framework that explains the resultant market value changes of family-controlled firms from corporate acquisition decisions is agency theory. Ownership structures affect the nature of the agency problem between managers and shareholders (Claessens and Yurtoglu 2013). When ownership is dispersed, agency problem stems from the conflicts of interests between outside shareholders and the managers (Jensen and Meckling 1976). The

[2] There are drawbacks when employing performance measures using accounting data. It is well known that accounting data can be distorted and influenced by firm-specific financial reporting idiosyncrasies (Peng and Jiang 2010).

conflict of interest between the managers and outside shareholders can be resolved when managerial ownership is increased to align the interests of the managers with those of the shareholders. This notion is also commonly referred to as the interest alignment hypothesis. However, when ownership is concentrated to the extent that the owner-managers have effective control of the firm, a conflict of interest between the controlling shareholders and the minority shareholders emerges (Anderson *et al.* 2012; Croci and Petmezas 2010; Villalonga and Amit 2006; Young *et al.* 2008).

The inherent feature of the owner-manager's position and concentrated family ownership in family-controlled firms intrinsically mitigates conflicts between owner and the manager, leading to better firm value (Shleifer and Vishny 1997). Based on the notion of neoclassical agency theory (principal-agent conflict of interests), concentrated family ownership in addition to family managerial roles becomes an inherent internal corporate governance mechanism that is beneficial to shareholders of family-controlled firms. Consequently, the inherent alignment of interests of family owners with other shareholders induces better value-enhancing strategic economic decisions, such as corporate acquisitions (Bhaumik and Selarka 2012). This follows the notion of the neoclassical agency theory of Jensen and Meckling (1976), which is also known as the principal-agent conflict theory or Agency Problem I. Neoclassical agency theory assumes that greater owner-manager shareholding leads to greater monitoring and discipline, hence enhances firm value.

The inherent feature of family owner-manager position and concentrated family ownership in family-controlled firms may also create a second potential conflict between the controlling family and the minority shareholders. This is known as the principal-principal conflict theory (Agency Problem II). Agency Problem II posits that concentrated family ownership at a certain level may lead to entrenchment of the controlling family or owner-manager, resulting in the expropriation of minority shareholders' wealth (Fama and Jensen 1983; Morck *et al.* 1988; Shleifer and Vishny 1997). The aim of maximising family utility may dominate the aim of maximising the overall shareholders' wealth (Bertrand and Schoar 2003). La Porta *et al.* (1999) warns that concentration of wealth in family-controlled firms leads to greater risk-aversion in owners belonging to the controlling family. This desire to minimise business risk can induce those owners to select less risky projects to the detriment of the economic development of family-controlled firms. In this context, where the controlling family-backed owner-manager's ownership is concentrated, the benefit of interest alignment of owner-manager (mitigation of Agency Problem I) is argued to be merely replaced by Agency Problem II (Anderson *et al.* 2012; Croci and Petmezas 2010; Villalonga and Amit 2006; Young *et al.* 2008).

Controlling family-backed owners with large shareholdings may facilitate conflicts between owners belonging to the controlling family and the minority shareholders through the realisation of private benefit of control (Aguilera and Crespi-Cladera 2012; Claessens and Yurtoglu 2013; Morck and Yeung 2003; Thomsen, Pedersen and Kvist 2006). Shareholders, such as those from the controlling family, with large and undiversified shareholdings, may favour investments based on their own risk preferences rather than those preferred by shareholders not from the controlling family (Fama and Jensen 1985). The overall resultant effect of principal-principal conflict (Agency Problem II) between controlling family-backed owners and minority shareholders is the executions of value-destroying investments, such as corporate acquisitions, a major corporate strategic decision (Bhau-

mik and Selarka 2012). The corporate governance issue of whether family owners with concentrated ownership contribute to the solution of agency conflicts or exacerbate them remains theoretically and empirically at odds (Bauguess and Stegemoller 2008; Bhaumik and Selarka 2012; Caprio *et al.* 2011; Shim and Okamuro 2011). This also means that the protection of minority shareholder interests matters (Claessens and Yurtoglu 2013).

This paper examined the following hypotheses:

H1: There is a significant positive relationship between family ownership and stock returns of family-controlled Malaysian firms during the period of announcement of corporate acquisitions.

H2: There is a significant negative relationship between family ownership and stock returns of family-controlled Malaysian firms during the period of announcement of corporate acquisitions.

2. Methodology

In this study, all family-related information and financial information were sourced from company annual reports. A total of 160 publically listed family-controlled Malaysian firms were examined. A Malaysian publically listed firm is considered as being a family-controlled firm when the following criteria are met:

i. At least one of the family members holds shares in the company;
ii. At least one of the family members manages the company (as proxied by holding at least one position on the board);
iii. The family is the heir of previous founders, if any;
iv. The family is the largest shareholder of the company;[3]
v. The family-controlled Malaysian firm is a publicly listed company on the Main Market of Bursa Malaysia (Bursa).;
vi. The family-controlled firms cover non-financial acquiring firms that are listed on the Bursa between the years 2001 and 2011 and have been involved in corporate acquisition activities between the years 2002 to 2011;
vii. Firms with a single dominating owner-manager (who can be a founder or a non-founder) are not considered as being family-controlled due to the possibility that the owner-manager may not transfer rights and control in the firms to heirs (Villalonga and Amit 2006).[4]

All corporate acquisition announcements used in this study were sourced from the 'announcement' section of the official website of the Bursa. The final sample of corporate acquisition announcements, which were publicly announced by family-controlled Malaysian firms (the acquirers), satisfied the following criteria:

i. Corporate acquisition announcements are publicly announced by family-controlled Malaysian firms in company press release, on the official website of the company or via the Bursa's website between the years 2002 to year 2011.

[3] This ensures the absolute control of the dominant family over the firm, both in terms of ownership and management. Family ownership is treated as the total corporate equity ownership held by all related family members. Hence the total family ownership is accumulated among those that are held by related family members.

[4] Relevant discussions are detailed in Section 2.

ii. The release of the corporate acquisition announcement by the acquirer is in pursuant to paragraphs 9.19(23) and 10.07(a) of Bursa's listing requirements.
iii. The acquirer published annual financial statement information and stock return data.
iv. The acquiring firm acquired at least 50 per cent or more of target's equity (Netter *et al.* 2011).

Past studies highlighted the difficulty of isolating the valuation effect of an examined event when there were financially relevant events[5] surrounding the day of the examined event (Brown and Warner 1985; Jarrell and Poulsen 1989; Konchitchki and O'Leary 2011; Lease *et al.* 1991; McWilliams and Siegel 1997). Subsequent false or misleading inferences regarding the significance of the event are then made. This study followed the recommendations from previous studies. Contaminated sample corporate acquisition announcements were not examined in this study. These were corporate acquisition announcements which coincided with any occurrences of financially relevant events, five days before and after the announcement day (Fuller *et al.* 2002).

Following Netter *et al.* (2011) and Vermaelen and Xu (2014), this study also examined both private and publically listed targets. This study also did not impose restrictions on the deal value, following past corporate acquisition studies (Netter *et al.* 2011; Vermaelen and Xu 2014). Netter *et al.* (2011) emphasised the misleading inferences made by past corporate acquisition studies based on unrepresentative samples. Past corporate acquisition studies restricted samples to corporate acquisition announcements with large publicly listed targets and large deal values. Inferences were drawn based on relatively small and unrepresentative samples. Netter *et al.*(2011) found that acquirers experienced significant positive wealth effect after corporate acquisition announcements. This contradicted past corporate acquisition findings where overall evidence showed that corporate acquisition announcements did not create value to acquirers.

The final sample in this study contained 267 corporate acquisition announcements made by family-controlled Malaysian firms between the years 2002 to 2011. These announcements were retrieved from the Bursa's website.[6]

The best way to examine the value creation or destruction of corporate acquisition transactions is by observation of the stock market's reaction to the examined announcements around the day of the announcement (Andrade *et al.* 2001).[7] To examine the stock market's responses to corporate acquisition announcements of the acquirers, event study methodology has been adopted. This method is widely referenced in the literature when examining the short-term wealth effect of corporate acquisitions (Alexandridis *et al.* 2013).

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[5] Financially relevant announcements include earnings (Brown and Warner 1985), stock splits (Cannella and Hambrick 1993), equity offerings (Masulis and Korwar 1986), asset acquisitions and corporate acquisitions.

[6] All corporate acquisition announcements of family-controlled Malaysian firms were retrieved from *http://www.bursamalaysia.com/market/listed-companies/company-announcements/.*

[7] To examine the valuation effect of corporate acquisition activities on the acquirers (the acquiring firms), other available approaches include market-based methods (long run stock performance) and accounting methods. The shortcomings of these two approaches have been mentioned. Martynova and Renneboog (2008) and Kothari and Warner (2007) provide a comprehensive review of past evidence on the limitations and weaknesses of the long run stock performance event study method. Andrade et al. (2001) also mention the problems that arise when using accounting performance to measure the valuation effect of corporate acquisition.

Examination of the valuation effect of an event (or an announcement) on a firm's market value via event study methodology has been a major focus in previour event study research. Event study methodology provides a powerful setting to examine the extent of informativeness of an event as assessed by market participants (Konchitchki and O'Leary 2011).[8] The basic aim of event study methodology is to isolate the effect of certain events on stock returns from other factors influencing the movement of the stock price (MacKinlay 1997). This effect is examined via 'abnormal return'. The abnormal return basically is the difference between the expected return and the observed return during the examined event period, which can be specified as

$$AR_{i,t}=R_{i,t}-E(R_{i,t}) \quad (1)$$

where $AR_{i,t}$ of event firm i at event date t represents a stochastic error term that has an expected value of zero and is uncorrelated over time. R_{it} is the actual observed return of firm i on day t. $E(R_{i,t})$ is the expected return for event firm i on day t. The deviations of actual return from the expected return are attributed to the event and constitute the abnormal return (MacKinlay 1997).[9] Accordingly, the daily stock returns employed for the event study methodology are derived for each event firm as:

$$R_{i,t} = \frac{P_{i,t}-P_{i,t-1}}{P_{i,t-1}} \quad (2)$$

where P i,t is the closing price for event firm i on day t. Each event firm i refers to a public-listed family-controlled Malaysian firm that made a public corporate acquisition announcement. The abnormal returns (as specified in equation 1) are then aggregated to a portfolio in order to draw overall inferences for the event of interest. By taking an equally-weighted portfolio, the aggregation is through time and across securities. First, individual event firm abnormal returns can be aggregated across securities, as follows:

$$\overline{AR_{t,t}} = \frac{1}{N}\left(\sum_{i=n}^{N} AR_{i,t}\right) \quad (3)$$

where N is the number of firm event, $AR_{i,t}$ is the abnormal return for security i at time t. The average abnormal returns are then aggregated over the event window. The aggregation is along two dimensions, across securities and through time.

$$\overline{CAR_t}(T_1,T_2) = \sum_{t=T1}^{T2} \overline{AR}_{i,t} \quad (4)$$

where $\overline{CAR_t}$ (T_1,T_2) is the average cumulated abnormal return across the observed event window and security events. The T_1,T_2 as specified in equation 4 denotes the number of days which $\overline{AR_{i,t}}$ (as specified in equation 3) is accumulated over the event window.

This study employed 250 days[10] as the period for the estimation of expected returns. The model took data from 260 days before the announcement day to eleven days before the

[8] Additionally, event studies have also been proposed as one of the solutions to hinder the common latent factor (causal interpretation) that impel a significant relationship between an observed factor and firm's market value (Morck and Yeung 2009). In essence, capital market valuation data carry a forward looking trait.

[9] Detailed description of event study methodology is discussed by MacKinlay (1997)

[10] As mentioned by Binder (1998), given the concerns about the stationarity of the market model parameters, studies tend to use one year of observations – 250 trading days to estimate parameters of the return generating model.

announcement. This study looked at an event window of Day -1 to Day +1 (Amira *et al.* 2013; Moeller et al. 2004; Pevzner et al. 2013).[11] The cumulated abnormal returns ($\overline{CAR_t}$) (-1,+1)) over Day -1 to Day +1 were used in this study to evaluate investor reaction (wealth effect) to corporate acquisition announcements of family-controlled Malaysian firms. Based on the most recent findings of Kolari and Pynnonen (2011), this study employed the GRANK test in testing the significance of cumulated abnormal returns generated from equation 4. The computation of the test statistic using GRANK procedure is in accordance with Kolari and Pynnonen (2011).

The baseline model employed in this study to analyse the research question is defined as:

$$CAR_i = \alpha_i + \beta_1 Own_i + \beta_2 FamilyCEO_i + \beta_3 Fam\_Ind_i + \beta_4 F\_Dual_i + \beta_5 DualCEO_i + \beta_6 Rpa_i + \beta_7 Firmyear_i + \beta_8 Ind\_Director_i + \beta_9 Pre\_CAR_i + \beta_{10} non\_related_i + \beta_{11} FCF_i + \beta_{12} LN\_MVE_i + \beta_{13} LN\_RM_i + \beta_{14} Crossborder_i + \beta_{15} Public_i + \beta_{16} Equity_i + \beta_{17} Yr08\_11_i + \varepsilon_i \quad \text{Equation 5}$$

A summary of the measurements for the variables is listed in the Appendix.

The variable of interest in this study is Own or Total family equity ownership as measured by total percentage of equity ownership in the company. Based on past studies, other explanatory variables were included as control variables. Regression diagnostics were performed on the baseline model for normality, multicollinearity, heteroskedasticity, model specification error and omitted variable tests. The Huber-White robust standard errors were applied to the base regression model in this study to address the issue of heteroskedasticity and normality.

3 Results and Analysis

3.1 Univariate Analysis: Wealth Effect of Corporate Acquisition Announcements

Family-controlled Malaysian firms, on average, experienced significant positive wealth effects after announcing acquisition activity as show in in Table 1. This suggests that Malaysia investors, on average, favoured corporate acquisitions attempted by family-controlled Malaysian firms. Results also revealed that family-controlled Malaysian firms, on average, do not perform corporate acquisitions that are value-destroying. Table 1 shows that across the three reported event windows, family-controlled Malaysian acquirers in general experienced positive wealth effect upon corporate acquisition announcements at 1 per cent significance level. For market model $\overline{CAR}$ (-1,+1), family-controlled Malaysian firms experienced an average of 0.41 per cent cumulated abnormal returns at 5 per cent significance level. The significance of the wealth effect experienced by family-controlled Malaysian firms continued to hold for market-adjusted model $\overline{CAR}$ (-1,+1), with an average of 0.6 per cent cumulated abnormal returns at 5 per cent significance level. The cumulated abnormal returns for family-controlled Malaysian acquirers increased over the seven-day event window (Day -3, +3). The ($\overline{CAR}$)(-3,+3) over a seven-day event window (Day

[11] It has been highlighted that a longer event window severely reduces the power of the test statistic, which leads to misleading inferences about the significance of the valuation effect of the announcements (Brown and Warner 1985). Brown and Warner (1985) employed an event window of Day -5 to Day +5 for their simulation studies. Their studies showed the decrease of power of the test on the valuation effect of events when the event window exceeds the intervals of Day -5 to Day +5.

Table 1. Announcement period mean cumulative abnormal returns for Malaysian family-controlled firms

The sample comprises mean cumulative abnormal returns ($\overline{CAR}$) from 267 corporate acquisition announcements of 129 family-controlled Malaysian firms. The 267 corporate acquisition announcements were categorised by announcements with acquirers under the management of family member CEO and professional CEO, across the sample period between 2002 and 2011. The average $\overline{CAR}$ of each categorised corporate acquisition announcements is expressed in terms of percentage returns. N and % of column 1 report the frequencies and percentage of the categorised sample corporate acquisition announcements, respectively. Columns 2, 3 and 4 display the average $\overline{CAR}$ estimated using market model. Columns 5, 6 and 7 present the average $\overline{CAR}$ estimated from market adjusted model. The $\overline{CAR}$ is reported over the three-day event window (-1,+1), the five-day event window (-2, +2) and even-day event window (-3,+3). The statistical test employed Kolari and Pynnonen's (2011) generalised rank test (GRANK) to examine if $\overline{CAR}$ were significantly different from zero. The numbers in parentheses denote the standard error. *,**, and *** stand for statistical significance of GRANK at the 10%, 5%, 1% levels, respectively.

	N (%)	Market Model CAR			Market Adjusted Model CAR		
		(-1,+1)	(-2,+2)	(-3,+3)	(-1,+1)	(-2,+2)	(-3,+3)
(CAR)	267	0.4198**	0.5974***	0.7153***	0.6002**	0.9400***	1.1969***
	(100%)	(2.0447)	(2.6828)	(3.1226)	(2.3610)	(3.3588)	(3.5199)

-3, +3) remained positive and significant with an average cumulated abnormal return of 0.71 per cent (1.19%) at 1 per cent significance level for market model (market-adjusted model) ($\overline{CAR}$).

3.2 Univariate Analysis: Wealth Effect of corporate acquisition announcements by Family Ownership

Table 2 shows the announcement-period mean cumulative abnormal returns ($\overline{CAR}$) for the sample of 267 corporate acquisition announcements over the years between 2002 and 2011, grouped according to different levels of family ownership in family-controlled Malaysian acquirers. This allowed prima facie evidence on the testing of Hypothesis 1 and Hypothesis 2. The announcement period ($\overline{CAR}$) for the family-controlled Malaysian acquirers were reported over the three-day event window (-1, +1), five-day event window (-2, +2) and seven-day event window (-3, +3) and are represented by $\overline{CAR}$ (-1,+1), $\overline{CAR}$(-2,+2) and $\overline{CAR}$ (-3,+3), respectively. Results shown in Table 2 provides preliminary evidence on the relationship between different levels of family ownership and announcement period CARs.

There was a significant positive correlation between family ownership and $\overline{CAR}$. When family ownership was less than 50 per cent, the significance of market model (market-adjusted model) $\overline{CAR}$ (-1,+1) was at 10 per cent (5%) with an average of 0.47 per cent (0.61%) cumulated abnormal returns over Day-1 to Day+1.[12] The significance increased when the event window was expanded. The significance of market model (market-adjusted model) $\overline{CAR}$ (-3,+3) was at 1 per cent (1%) with an average of 0.91 per cent (1.29%) cu-

[12] Day 0 is the day of announcement

Table 2. Announcement period mean cumulative abnormal returns for family-controlled Malaysian firms for subsamples categorised by family ownership

The sample comprises mean cumulative abnormal returns ($\overline{CAR}$) from a 267 corporate acquisition announcements of 129 family-controlled Malaysian firms. The 267 corporate acquisition announcements were categorised by family ownership across the sample period between 2002 and 2011. The term 'Less than 50%' denotes family ownership of less than 50% in acquirer firms. The term '50% or more' denotes family ownership of 50% or more in acquirer firms. The term 'Between 50%-60%' denotes family ownership of between 50% and 60% in acquirer firms. The term '70% and more' denotes family ownership at 70% or more in acquirer firms. The average $\overline{CAR}$ of each categorised corporate acquisition announcement isexpressed in terms of percentage returns. N and % of column 1 report the frequencies and percentage of the categorised sample corporate acquisition announcements, respectively. Columns 2, 3 and 4 display the average $\overline{CAR}$ estimated using market model. Columns 5, 6 and 7 present the average $\overline{CAR}$ estimated from market adjusted model. The $\overline{CAR}$ is reported over the three-day event window (-1,+1), the five-day event window (-2, +2) and the seven-day event window (-3,+3). The statistical test employs Kolari and Pynnonen's (2011) generalised rank test (GRANK) to examine if $\overline{CAR}$ were significantly different from zero. The numbers in parentheses denote the standard error. *,**, and *** stand for statistical significance of GRANK at the 10%, 5%, 1% levels, respectively.

N	Market Model (%)	Market Adjusted Model $\overline{CAR}$			$\overline{CAR}$		
$\overline{CAR}$		(-1,+1)	(-2,+2)	(-3,+3)	(-1,+1)	(-2,+2)	(-3,+3)
Subsamples grouped by family ownership							
Less	158	0.4749*	0.4702**	0.9136***	0.6171**	0.7712**	1.2921***
than 50%	(59%)	(1.9565)	(1.9772)	(2.9773)	(2.0840)	(2.3885)	3.1857
Between	61	0.6645*	1.2291**	0.6355	0.8234*	1.5566***	1.2223
50%-60%	(56%)	(1.7500)	(2.1847)	(0.9450)	(1.7680)	(2.6360)	(1.4437)
70% and	16	-1.1070***	-1.4654**	-0.9142	-0.6656**	-0.7606	-0.0159
more	(6%)	(-3.4660)	(-1.9132)	(-0.6306)	(-2.3883)	(-1.2163)	(-0.3096)

mulated abnormal returns over Day-3 to Day+3. However, the significance of positive announcement wealth effect experienced by family-controlled Malaysian acquirers only persisted across different event windows when family ownership was less than 50 per cent.

Further investigation revealed possible support for a non-linear relationship between family ownership and family-controlled firm value. Table 2 shows more details on $\overline{CAR}$ that were grouped according to higher concentration levels of family ownership. For acquirers with family ownership of more than 50%, significant positive announcement wealth effect diminishes. Also listed in Table 2 are $\overline{CAR}$s tabulated for family ownership levels of 70 per cent or more. The $\overline{CAR}$s across different event windows become negative and were mostly significant. Hence, ownership concentrated in the hands of family reduced Agency Problem I (principal-agent conflicts). However, when a certain level of family ownership was reached, the benefit of mitigating Agency Problem I was substituted with higher cost incurred by Agency Problem II (principal-principal conflicts). This was observable within the context of family-controlled Malaysian firms.

3.3 Multivariate Analysis: Results for Baseline Model Regression

This section examines returns upon acquisition announcements to family-controlled Malaysia acquirers in a multivariate regression setting. To control for all known determinants of acquirer returns within the context of family-controlled Malaysian firm studies, the determinants were recognised based on past empirical evidence in the literature of family-controlled firms and corporate acquisitions.

Table 3 shows the results generated from equation 6 using ordinary least squares (OLS) regressions. The results of the multivariate regressions that regress the dependent variable $\overline{CAR}$ on the explanatory variables, across the three-day event window (-1, +1), five-day event window (-2, +2) and seven-day event window (-3, +3), are shown in columns (1)-(3) and columns (4)-(6), respectively. The dependent variable $\overline{CAR}$ of columns (1)-(3) were estimated from the market model. The dependent variable $\overline{CAR}$ of columns (4)-(6) were estimated from the market-adjusted model.

Existing corporate acquisition studies (Chang 1998; Fuller *et al.* 2002; Morck *et al.* 1990; Travlos 1987) mention that results from the regression models with low R square must be viewed with scepticism, even if the F-value for the regression models are positive and significant. In agreement with previous studies, a significant F-value at 1 per cent across all models from Column (1)-(6) is shown in Table 3. F-value is a measure of the overall significance of the estimated regression model (Gujarati 2004). The F-value in Table 3 exhibits 1 per cent significant level and rejects the F-test null hypothesis that all of the coefficients are equal to zero. The highest F-value at 1 per cent significant level, with the highest reported R-Square is shown in Column (1). All the examined models in Table 3 with 1 per cent significant level of F-value have statistically significant predictive capability.

The insignificant relationship between the variable *Own* and $\overline{CAR}$ of different event windows and different measures provide support in rejecting Hypothesis 1 and Hypothesis 2. Based on the results from Section 3.2, this paper further investigates the possibility of a non linear relationship between family ownership and family firm value. Following past family firm studies[13], the baseline model is expanded by including the new variable Own^2, which follows the following equation:

$$CAR_i = \alpha_i + \beta_{i1}\, Own_i + \beta_{i2}\, Own^2{}_i + \beta_{i3}\, FamilyCEO_i + \beta_{i4}\, Fam\_Ind_i + \beta_{i5}\, F\_Dual_i + \beta_{i6}\, DualCEO_i + \beta_{i7}\, Ind\_Director_i + \beta_{i8}\, Rpa_i + \beta_{i9}\, Firmyear_i + \beta_{i10}\, Pre\_CAR_i + \beta_{i11}\, non\_related_i + \beta_{i12}\, FCF_i + \beta_{i13}\, LN\_MVE_i + \beta_{i14}\, LN\_RM_i + \beta_{i15}\, Crossborder_i + \beta_{i16}\, Public_i + \beta_{i7}\, Equity_i + \beta_{i8}\, Yr08\_11_i + \varepsilon_i \quad \text{Equation 6}$$

The variable of interest is *Own* and Own^2. These two variables examined in equation 2 allow examination on the possibilities of non-linear relationship between family ownership and family firm value. Results from the linear regression estimation on equation 2 are reported in Table 4.

Results of the multivariate regressions that regressed the dependent variable $\overline{CAR}$ on

[13] Findings have documented a significant non-linear relationship between family ownership and family firm value for family firms of S&P500 in USA (Anderson and Reeb 2003), Poland (Kowalewski *et al.*2010), Canada (Ben-Amar and André 2006), Europe (Maury 2006; Pindado *et al.* 2013) and Swizterland (Isakov and Weisskopf 2014).

Table 3. Baseline model regression of family-controlled Malaysian acquirers cumulative abnormal returns $\overline{CAR}$

$CAR_i = \alpha_i + \beta_{i1}\, Own_i + \beta_{i2}\, FamilyCEO_i + \beta_{i3}\, Fam\_Ind_i + \beta_{i4}\, F\_Dual_i + \beta_{i5}\, DualCEO_i + \beta_{i6}\, Ind\_Director_i + \beta_{i7}\, Rpa_i + \beta_{i8}\, Firmyear_i + \beta_{i9}\, Pre\_CAR_i + \beta_{i10}\, non\_related_i + \beta_{i11}\, FCF_i + \beta_{i12}\, LN\_MVE_i + \beta_{i13}\, LN\_RM_i + \beta_{i14}\, Crossborder_i + \beta_{i15}\, Public_i + \beta_{i6}\, Equity_i + \beta_{i7}\, Yr08\_11_i + \varepsilon_i$

The sample comprises 267 observations. The observations denote 267 corporate acquisition announcements made by 129 family-controlled Malaysian firms listed on the Main Board of Bursa across the sample period between 2002 and 2011. The reported dependent variable, $\overline{CAR}$, is regressed against the independent variables and control variables for each model from columns (1)-(6). Column 1, 2 and 3 report the $\overline{CAR}$ that were estimated using market model. Columns 4, 5 and 6 reports the $\overline{CAR}$ that were estimated from market adjusted model. The CAR denotes cumulative abnormal returns over an event window for each observation. The reported CAR estimated from both the market model and market adjusted model are cumulated over a three-day event window (-1, +1), five-day event window (-2, +2) and seven-day event window (-3,+3), respectively. Day 0 denotes the day of corporate acquisition announcement. The numbers in parentheses denote the standard error. The *,**, and *** stand for statistical significance based on two-wide tests at the 10%, 5%, 1% levels, respectively. The variable *Own* denotes total family equity ownership as measured by total percentage of equity ownership in the company. The variable *FamilyCEO* denotes a dummy variable that equals to one when family member of the controlling family is the CEO, zero otherwise. The variable *Fam_Ind* denotes a dummy variable that equals to one when the ratio of total number family members on board over total numbers of independent directors on board is more than 1, zero otherwise. The variable *DualCEO* denotes a dummy variable that equals to one when the position of CEO and chairman are both held by the same individual, zero otherwise. The variable *Ind_Director* denotes the total percentage of independent directors on the board. The variable *Rpa* denotes a dummy variable that equals to one when the acquisition is a related party corporate acquisition, zero otherwise The variable *Firmyear* denotes the age of the company. The variable *Pre* $\overline{CAR}$ denotes an acquirer's pre-announcement stock price run-up, which is measured by cumulative abnormal returns over the 200-day window (event day -210 to day -11) and is estimated using market model. The variable *non_related* denotes a dummy variable that equals to one when target is not within the same industry as the industry of the acquirer, zero otherwise. The variable *FCF d*enotes free cash flow ratio that is measured by Operating Income + Depreciation – Interest expense – Taxes – Preferred dividend – Common dividend) / Total Assets . The variable *LN_MVE* denotes firm size that is measured by log of market capitalisation. The variable *LN_RM* denotes transaction size that is measured by the log of transaction dollar value of the acquisition in Malaysia Ringgit. The variable *Crossborder* denotes a dummy variable that equals to one for the acquisition of non-domestic target, zero otherwise. The variable *Public* denotes a dummy variable that equals to one for acquisition of public target, zero otherwise. The variable *Equity* denotes a dummy variable that equals to equity-financed acquisition, zero otherwise. The variable *Yr08_11* denotes a dummy variable that is equal to one when the year of the event is during the period between 2008-2011, zero otherwise.

	Market Model			Market Adjusted Model		
CARs	(-1,+1)	(-2,+2)	(-3,+3)	(-1,+1)	(-2,+2)	(-3,+3)
Own	-0.0036	0.0254	-0.0036	-0.0075	0.0214	-0.0050
	(-0.21)	(0.97)	(-0.13)	(-0.43)	(0.85)	(-0.19)
FamilyCEO	1.2975*	1.7412*	1.4894	0.9824	1.5613	1.2811
	(1.82)	(1.66)	(1.45)	(1.32)	(1.43)	(1.26)
Fam_Ind	-1.2527**	-1.2124	-0.2877	-1.2001**	-1.1995	-0.2581
	(-2.35)	(-1.53)	(-0.30)	(-2.24)	(-1.54)	(-0.27)

F_Dual	-0.5704	-1.9075**	-1.5486*	-0.4707	-1.8948**	-1.4271
	(-0.98)	(-2.42)	(-1.65)	(-0.80)	(-2.43)	(-1.53)
DualCEO	-0.6872	-0.0755	-0.2495	-0.7231	-0.1584	-0.3862
	(-1.17)	(-0.08)	(-0.24)	(-1.22)	(-0.17)	(-0.38)
Ind_Director	-0.0863***	-0.1187***	-0.1218***	-0.0807***	-0.1075***	-0.1043***
	(-4.23)	(-4.99)	(-3.74)	(-3.87)	(-4.67)	(-3.38)
Rpa	-0.9027**	-1.4820**	-1.5882**	-1.0789**	-1.7314***	-1.9070***
	(-2.00)	(-2.38)	(-2.29)	(-2.30)	(-2.75)	(-2.81)
Firmyear	0.0268**	0.0352**	0.0489**	0.0194	0.0231	0.0342*
	(2.20)	(2.01)	(2.29)	(1.54)	(1.29)	(1.72)
Pre_CAR	0.0165	0.0150	0.0148	0.0132**	0.0149*	0.0174*
	(0.99)	(0.77)	(0.64)	(2.09)	(1.82)	(1.93)
non_related	-1.4288**	-0.6482	-0.9897	-1.4810**	-0.8381	-1.2424
	(-2.03)	(-0.74)	(-0.93)	(-2.04)	(-0.95)	(-1.17)
FCF	0.4244	4.2591	9.4492	-0.9666	1.6870	6.6886
	(0.08)	(0.59)	(1.18)	(-0.18)	(0.24)	(0.86)
LN_MVE	-0.0526	-0.0717	0.0590	-0.0060	-0.0290	0.0904
	(-0.36)	(-0.29)	(0.23)	(-0.04)	(-0.11)	(0.35)
LN_RM	-0.3518***	-0.3911**	-0.4143*	-0.3253***	-0.3095*	-0.3096
	(-2.80)	(-2.11)	(-1.73)	(-2.66)	(-1.76)	(-1.33)
Crossborder	-1.3601***	-1.6637**	-1.2285	-1.2803***	-1.5307**	-0.9475
	(-3.06)	(-2.58)	(-1.51)	(-2.86)	(-2.42)	(-1.17)
Public	2.7986*	0.6814	0.8374	2.6278	1.1469	1.6791
	(1.65)	(0.17)	(0.30)	(1.49)	(0.26)	(0.54)
Equity	2.1996**	2.7319*	3.3505**	1.9753*	2.5727**	2.9863*
	(1.98)	(1.96)	(2.01)	(1.74)	(2.03)	(1.90)
Yr08_11	-0.8850**	-0.7102	-0.4049	-0.7439*	-0.5838	-0.3178
	(-2.11)	(-1.22)	(-0.60)	(-1.77)	(-1.01)	(-0.49)
Constant	11.0291***	11.6838***	10.0219**	10.1367***	10.0140**	8.0011*
	(3.93)	(2.99)	(2.19)	(3.51)	(2.48)	(1.76)
Observations	267	267	267	267	267	267
R-squared	0.186	0.144	0.120	0.180	0.138	0.111
Adjusted R-squared	0.131	0.0857	0.0601	0.124	0.0789	0.0499
F-Test	3.657***	3.283***	2.492***	3.095***	2.864***	2.116***
	(0.0000)	(0.0003)	(0.0045)	(0.0004)	(0.0029)	(0.0070)

the explanatory variables, across the three-day event window (-1, +1), five-day event window (-2, +2) and seven-day event window (-3, +3), are listed in columns (1)-(30) and (4)-(60) of Table 4, respectively. The dependent variable $\overline{CAR}$ in Columns (1)-(3) was estimated from the market model. The dependent variable $\overline{CAR}$ of Columns (4)-(6) was estimated from the market-adjusted model.

Results from columns (1) and (3) supporta non-linear relationship between family ownership and $\overline{CAR}$. Columns (1) and (3) report 5 per cent significance level for the coefficients of the variables *Own* and Own^2. The results indicate that there is a significant non-linear relationship between family ownership and $\overline{CAR}$. The inflection point where the beneficial effect of family ownership of Malaysian firms begins to diminish is at 46.76 per cent (47.13%) for market model $\overline{CAR}$ (+1,+1) (market adjusted model ($\overline{CAR}$ (+1,+1)). A similar

Table 4. Non-linearity between Malaysian family-controlled acquirers cumulative abnormal returns $\overline{CAR}$ and family ownership: squared polynomial model

$$CAR_i = \alpha_i + \beta_{i1}\, Own_i + \beta_{i2}\, Own_{2i} + \beta_{i3}\, FamilyCEO_i + \beta_{i4}\, Fam\_Ind_i + \beta_{i5}\, F\_Dual_i + \beta_{i6}\, DualCEO_i + \beta_{i7}\, Ind\_Director_i + \beta_{i8}\, Rpa_i + \beta_{i9}\, Firmyear_i + \beta_{i10}\, Pre\_CAR_i + \beta_{i11}\, non\_related_i + \beta_{i12}\, FCF_i + \beta_{i13}\, LN\_MVE_i + \beta_{i14}\, LN\_RM_i + \beta_{i15}\, Crossborder_i + \beta_{i16}\, Public_i + \beta_{17}\, Equity_i + \beta_{18}\, Yr08\_11_i + \varepsilon_i$$

The sample comprises 267 observations. The observations denote 267 corporate acquisition announcements made by 129 Malaysian family-controlled firms listed on the Main Board of Bursa across the sample period 2002 and 2011. The reported dependent variable – $\overline{CAR}$ is regressed against the independent variables and control variables for each model from Columns (1)-(6). Columns 1, 2 and 3 report the $\overline{CAR}$ that are estimated using market model. Columns 4, 5 and 6 reports the $\overline{CAR}$ that are estimated from market adjusted model. The $\overline{CAR}$ denotes cumulative abnormal returns over an event window for each observation. The reported $\overline{CAR}$ estimated from both the market model and market adjusted model are cumulated over the three-day event window (-1, +1), the five-day event window (-2, +2) and the seven-day event window (-3,+3), respectively. Day 0 denotes the day of corporate acquisition announcement release. The numbers in parentheses denote the standard error. The *,**, and *** stand for statistical significance based on two-wide tests at the 10%, 5% &1% levels, respectively. The variable *Own* denotes total family equity ownership as measured by total percentage of equity ownership in the company. The variable Own^2 denotes squared *Own*. The variable *FamilyCEO* denotes a dummy variable that equals to one when family member of the controlling family is the CEO, zero otherwise. The variable *Fam_Ind* denotes a dummy variable that equals to one when the ratio of total number family members on board over total numbers of independent directors on board is more than 1, zero otherwise. The variable *DualCEO* denotes a dummy variable that equals to one when the position of CEO and chairman are both held by the same individual, zero otherwise. The variable *Ind_Director* denotes the total percentage of independent directors on the board. The variable *Rpa* denotes a dummy variable that equals to one when the acquisition is a related party corporate acquisition, zero otherwise. The variable *Firmyear* denotes the firm age of the company. The variable *Pre_CAR* denotes an acquirer's pre-announcement stock price run-up, which is measured by cumulative abnormal returns over the 200-day window (event day -210 to day -11) and is estimated using market model. The variable *non_related* denotes a dummy variable that equals one when target is not within the same industry as the industry of the acquirer, zero otherwise. The variable *FCF* denotes free cash flow ratio that is measured by Operating Income + Depreciation – Interest expense – Taxes – Preferred dividend – Common dividend) / Total Assets . The variable *LN_MVE* denotes firm size that is measured by log of market capitalization. The variable *LN_RM* denotes transaction size that is measured by the log of transaction dollar value of the acquisition in Malaysia Ringgit currency. The variable *Crossborder* denotes a dummy variable that equals to one for the acquisition of non-domestic target, zero otherwise. The variable *Public* denotes a dummy variable that equals to one for acquisition of public target, zero otherwise. The variable *Equity* denotes a dummy variable that equals to equity-financed acquisition, zero otherwise. The variable *Yr08_11* denotes a dummy variable that equals to one when the year of the event is during the period of 2008-2011, zero otherwise.

	Market Model			Market Adjusted Model		
CARs	(-1,+1)	(-2,+2)	(-3,+3)	(-1,+1)	(-2,+2)	(-3,+3)
Own	0.1964*	0.2806*	0.0945	0.1885*	0.2776	0.1176
	(1.90)	(1.67)	(0.57)	(1.81)	(1.58)	(0.70)
Own2	-0.0021**	-0.0026	-0.0010	-0.0020**	-0.0027	-0.0013
	(-2.08)	(-1.54)	(-0.60)	(-2.01)	(-1.46)	(-0.74)
FamilyCEO	1.0681	1.4485	1.3767	0.7612	1.2722	1.1428

	(1.50)	(1.41)	(1.35)	(1.02)	(1.19)	(1.16)
Fam_Ind	-1.3315**	-1.3128	-0.3264	-1.2781**	-1.3015	-0.3069
	(-2.47)	(-1.62)	(-0.33)	(-2.35)	(-1.63)	(-0.32)
F_Dual	-0.5571	-1.8904**	-1.5420	-0.4395	-1.8540**	-1.4076
	(-0.95)	(-2.39)	(-1.64)	(-0.74)	(-2.36)	(-1.50)
DualCEO	-0.7776	-0.1909	-0.2939	-0.8061	-0.2668	-0.4381
	(-1.33)	(-0.21)	(-0.28)	(-1.37)	(-0.29)	(-0.42)
Ind_Director	-0.0829***	-0.1144***	-0.1202***	-0.0773***	-0.1030***	-0.1022***
	(-4.07)	(-4.73)	(-3.70)	(-3.70)	(-4.41)	(-3.33)
Rpa	-0.9839**	-1.5856**	-1.6280**	-1.1615**	-1.8393***	-1.9586***
	(-2.12)	(-2.50)	(-2.32)	(-2.40)	(-2.85)	(-2.85)
Firmyear	0.0264**	0.0347**	0.0487**	0.0195	0.0232	0.0343*
	(2.17)	(2.00)	(2.29)	(1.54)	(1.31)	(1.73)
Pre_CAR	0.0136	0.0113	0.0134	0.0135**	0.0153*	0.0176*
	(0.81)	(0.61)	(0.58)	(2.19)	(1.88)	(1.93)
non_related	-1.4016*	-0.6135	-0.9763	-1.4486**	-0.7958	-1.2222
	(-1.97)	(-0.71)	(-0.91)	(-1.97)	(-0.90)	(-1.14)
FCF	-0.9492	2.5064	8.7749	-2.1436	0.1489	5.9526
	(-0.18)	(0.35)	(1.07)	(-0.41)	(0.02)	(0.76)
LN_MVE	-0.0985	-0.1303	0.0365	-0.0507	-0.0874	0.0625
	(-0.66)	(-0.51)	(0.14)	(-0.32)	(-0.33)	(0.24)
LN_RM	-0.3288**	-0.3617*	-0.4030*	-0.3033**	-0.2807	-0.2958
	(-2.58)	(-1.93)	(-1.68)	(-2.46)	(-1.57)	(-1.26)
Crossborder	-1.3612***	-1.6651**	-1.2291	-1.2856***	-1.5375**	-0.9508
	(-3.08)	(-2.58)	(-1.51)	(-2.89)	(-2.43)	(-1.17)
Public	2.8380*	0.7317	0.8568	2.6814*	1.2169	1.7126
	(1.87)	(0.21)	(0.33)	(1.70)	(0.31)	(0.59)
Equity	2.3623**	2.9394*	3.4303**	2.1434*	2.7923**	3.0914*
	(2.02)	(1.96)	(2.02)	(1.81)	(2.05)	(1.93)
Yr08_11	-0.8565**	-0.6738	-0.3909	-0.7176*	-0.5494	-0.3013
	(-2.07)	(-1.16)	(-0.58)	(-1.73)	(-0.95)	(-0.46)
Constant	7.3151**	6.9446	8.1988	6.4467**	5.1916	5.6935
	(2.39)	(1.57)	(1.61)	(2.11)	(1.17)	(1.11)
Observations	267	267	267	267	267	267
R-squared	0.200	0.155	0.122	0.192	0.149	0.113
Adjusted R-squared	0.142	0.0941	0.0578	0.134	0.0873	0.0483
F-Test	3.570***	3.017***	2.364***	2.965***	2.648***	1.986**
	(0.0000)	(0.0001)	(0.0018)	(0.0001)	(0.0004)	(0.0111)

relationship is also found based on the results in columns (2) and (4), with an inflection point at 53.96 per cent and 51.41 per cent respectively, when generating $\overline{CAR}$ (-2,+2) across the five-day event window. The inflection point, based on results of columns (3) and (6) is at 47.25 per cent and 45.23 per cent, respectively, for the seven-day event window (CAR) (-3,+3). The overall results indicate that family-controlled Malaysian firms' performance increases until the controlling families own close to 50 per cent or more of the equity shareholdings in family firms. Beyond this point ,company performance and value declined.

This finding is consistent with results of Pindado *et al.* (2013) who found that the opti-

mal level of family ownership which maximises the value of family-controlled firms is 51 per cent. However, the results of the optimal level of family ownership concentration levels contrasted with Anderson and Reeb (2003) for family-controlled firms in the United States of Ameria, which they suggest was only 30 per cent. The controlling family of a firm in Malaysia must acquire half or more of the firm to maximise the firm's value. However, the controlling family of a firm in the United States of America need only acquire one third of the firm to maximise the firm's value. Pindado *et al.* (2013) suggest that family-controlled firms in Switzerland and Malaysia need to own larger stakes in the firms for maintaining an effective decision making process.

The difference is consistent with past findings on the levels of concentration of ownership in family-controlled firms in Asia, in contrast with their counterparts from developed countries (Carney and Child 2012; La Porta *et al.* 1999). The levels of ownership concentration in family-controlled firms in Asia are necessary for several reasons. Lins (2003) states that it is an internal control mechanism that serves as a substitute for scarce institutional governance mechanisms. Denis and McConnell (2003) and Lins (2003) add that the controlling family is responsible for monitoring roles to overcome the lack of investor protection system, as well as to reduce expropriations. These measures were found to increase firm value (Denis & McConnell 2003; Lins 2003).

Based on the results of this study, further light is shed on the conflicting theoretical predictions on the effect of the concentration levels of ownership in family-controlled firm's value, and in particular on the Interest Alignment Hypothesis and the prediction of Agency Problem II theory. Results indicate that family-controlled Malaysian firms increased in value with the increased levels of ownership of the controlling family. This supported the notion of the interest alignment hypothesis. A few features inherent in family-controlled firms (ownership and managerial roles) naturally mitigate the conflict of interests between the principals and the agents, leading to the alignment of interest between both parties (Agrawal and Knoeber 2012; Dalton *et al.* 2007; La Porta *et al.* 2000; Shleifer and Vishny 1997).

Results of this study also indicate that the positive relationship between family ownership and firm value is not constant over the whole range of family ownership levels. When family ownership reaches a certain level of concentration, the firm value becomes inversely related. In this case, family opportunism increases with the increasing family ownership (Maury 2006). This is also consistent with past findings which show a non-linear relationship between family ownership and firm value for family-controlled firms covered by the S&P500 index in the United States of Ameria (Anderson and Reeb 2003), Poland (Kowalewski *et al.* 2010), Canada (Ben-Amar and André 2006), Europe (Maury 2006; Pindado *et al.* 2013) and Switzerland (Isakov and Weisskopf 2014).

3.4 Robust Analysis

To make sure the results of this study were robust, the expanded model was re-estimated using robust regressions. The robust regression down-weights observations with larger absolute residuals using iterative weighted least squares (Blanchard and Leigh 2013). Robust regression can help justify the use of ordinary least squares results (Verardi and Croux 2009). When robust regression results are similar to those for ordinary least squares, there is assurance that ordinary least squares are not unduly influenced by the outliers (Abell *et*

al. 1999). Results for the robust regression are shown in Table 5.

Results in columns (1) and (3) of Table 5 again support past findings that there is a non-linear relationship between family ownership and (CAR) □. A 5% significance level for the coefficient of *Own* and Own^2 is listed in columns (1) and (3), respectively, consistent with earlier results shown in Table 4.

Following Morck *et al.* (1988), the analysis was repeated using piecewise linear regression to further investigate the non-linear relationship between family ownership and firm value. This was to provide further affirmation of the non-linear relationship between family ownership and firm value. The piecewise linear regression was estimated using

Table 5. Robust regression of family-controlled Malaysian acquirers' $\overline{CAR}$

$$\overline{CAR}_i = \alpha_i + \beta_{i1}\, Own_i + \beta_{i2}\, Own^2_i + \beta_{i3}\, FamilyCEO_i + \beta_{i4}\, Fam\_Indi + \beta_{i5}\, F\_Dual_i + \beta_{i6}\, DualCEO_i + \beta_{i7} Ind\_Director_i + \beta_{i8}\, Rpa_i + \beta_{i9}\, Firmyear_i + \beta_{i10}\, Pre\_CAR_i + \beta_{i11}\, non\_related_i + \beta_{i12}\, FCF_i + \beta_{i13}\, LN\_MVE_i + \beta_{i14}\, LN\_RM_i + \beta_{i15}\, Crossborder_i + \beta_{i16}\, Public_i + \beta_{17}\, Equity_i + \beta_{18}\, Yr08\_11_i + \varepsilon_i$$

The sample comprises 267 observations. The observations denote 267 corporate acquisition announcements made by 129 Malaysian family-controlled firms listed on the Main Board of Bursa across the sample period 2002 and 2011. The reported dependent variable – $\overline{CAR}$ is regressed against the independent variables and control variables for each model from Columns (1)-(6). Columns 1, 2 and 3 report the $\overline{CAR}$ that are estimated using market model. Columns 4, 5 and 6 report the $\overline{CAR}$ that are estimated from market adjusted model. The $\overline{CAR}$ denotes cumulative abnormal returns over an event window for each observation. The reported CAR estimated from both the market model and market adjusted model are cumulated over a three-day event window (-1, +1), five-day event window (-2, +2) and seven-day event window (-3,+3), respectively. Day 0 denotes the day of corporate acquisition announcement. The numbers in parentheses denote the standard error. The *,**, and *** stand for statistical significance based on two-wide tests at the 10%, 5%, 1% levels, respectively. The variable *Own* denotes total family equity ownership as measured by total percentage of equity ownership in the company. The variable Own^2 denotes squared *Own*. The variable *FamilyCEO* denotes a dummy variable that equals to one when a family member of the controlling family is the CEO, zero otherwise. The variable *Fam_Ind* denotes a dummy variable that equals to one when the ratio of total number family members on board over total numbers of independent directors on board is more than 1, zero otherwise. The variable *DualCEO* denotes a dummy variable that equals to one when the position of CEO and chairman are both held by the same individual, zero otherwise. The variable *Rpa* denotes a dummy variable that equals to one when the acquisition is a related party corporate acquisition, zero otherwise The variable *Ind_Director* denotes the total percentage of independent directors on the board. The variable *Firmyear* denotes the age of the company. The variable *Pre_CAR* denotes an acquirer's pre-announcement stock price run-up, which is measured by cumulative abnormal returns over the 200-day window (event day -210 to day -11) and is estimated using market model. The variable *non_related* denotes a dummy variable that equals to one when target is not within the same industry as the industry of the acquirer, zero otherwise The variable *FCF* denotes free cash flow ratio that is measured by Operating Income + Depreciation – Interest expense – Taxes – Preferred dividend – Common dividend / Total Assets . The variable *LN_MVE* denotes firm size measured by log of market capitalisation. The variable *LN_RM* denotes transaction size that is measured by the log of transaction dollar value of the acquisition in Malaysian Ringgit. The variable *Crossborder* denotes a dummy variable that equals to one for the acquisition of non-domestic target, zero otherwise. The variable *Public* denotes a dummy variable that equals to one for acquisition of public target, zero otherwise. The variable *Equity* denotes a dummy variable that equals to equity-financed acquisition, zero otherwise. The variable *Yr08_11* denotes a dummy variable that equals to one when the year of the event is during the period between 2008-2011, zero otherwise.

	Market Model			Market Adjusted Model		
CARs	(-1,+1)	(-2,+2)	(-3,+3)	(-1,+1)	(-2,+2)	(-3,+3)
Own	0.1761**	0.0545	0.0530	0.1842**	0.0200	0.1218
	(2.10)	(0.45)	(0.39)	(2.22)	(0.17)	(0.99)
Own2	-0.0017**	-0.0004	-0.0005	-0.0018**	-0.0000	-0.0012
	(-2.00)	(-0.29)	(-0.38)	(-2.09)	(-0.03)	(-0.95)
FamilyCEO	1.0296*	1.8635**	1.4632	0.8203	1.5911*	1.5483*
	(1.76)	(2.22)	(1.56)	(1.41)	(1.91)	(1.79)
Fam_Ind	-0.9122**	-1.0656	0.2246	-0.9322**	-1.0408	0.2078
	(-2.01)	(-1.64)	(0.31)	(-2.06)	(-1.61)	(0.31)
F_Dual	-0.7649	-1.7409**	-1.9352**	-0.6854	-1.8246***	-2.2783***
	(-1.56)	(-2.48)	(-2.47)	(-1.42)	(-2.64)	(-3.17)
DualCEO	-0.3720	-0.5065	-0.6914	-0.3225	-0.7315	-0.9233
	(-0.76)	(-0.73)	(-0.89)	(-0.67)	(-1.06)	(-1.29)
Rpa	-0.0803***	-0.1064***	-0.0801**	-0.0765***	-0.0969***	-0.0595**
	(-4.12)	(-3.81)	(-2.57)	(-3.95)	(-3.51)	(-2.07)
Firmyear	-0.3753	-0.8020	-0.4747	-0.5733	-0.9615*	-0.5725
	(-0.92)	(-1.37)	(-0.73)	(-1.41)	(-1.66)	(-0.95)
Pre_CAR	0.0348***	0.0372**	0.0569***	0.0335***	0.0204	0.0370**
	(3.06)	(2.28)	(3.12)	(2.96)	(1.27)	(2.21)
non_related	0.0020	-0.0014	0.0113	0.0091**	0.0078	0.0061
	(0.18)	(-0.09)	(0.62)	(2.11)	(1.25)	(0.94)
Ind_Director	-0.9879*	-0.6436	-0.4379	-0.8572	-0.6945	-0.5691
	(-1.76)	(-0.80)	(-0.49)	(-1.54)	(-0.87)	(-0.69)
FCF	0.9226	6.6745	9.6863	-0.9983	5.3927	4.9803
	(0.21)	(1.07)	(1.39)	(-0.23)	(0.87)	(0.77)
LN_MVE	-0.0903	-0.0598	-0.0133	-0.0709	0.1266	0.0472
	(-0.67)	(-0.31)	(-0.06)	(-0.53)	(0.66)	(0.24)
LN_RM	-0.2670**	-0.2162	-0.2340	-0.2122*	-0.1604	-0.1746
	(-2.35)	(-1.33)	(-1.29)	(-1.88)	(-0.99)	(-1.04)
Crossborder	-0.9877**	-1.0657*	-0.7602	-0.9020**	-0.9091	-0.6172
	(-2.48)	(-1.87)	(-1.19)	(-2.28)	(-1.61)	(-1.05)
Public	2.5155*	4.2225**	0.7333	2.0995	2.7191	2.0227
	(1.87)	(2.19)	(0.34)	(1.57)	(1.43)	(1.02)
Equity	1.8370*	2.6198*	3.4771**	1.5096	2.5659*	3.5178**
	(1.78)	(1.77)	(2.10)	(1.47)	(1.75)	(2.31)
Yr08_11	-0.5901*	-0.6158	-0.1976	-0.4496	-0.3587	0.0128
	(-1.67)	(-1.22)	(-0.35)	(-1.28)	(-0.72)	(0.02)
Constant	4.9378	6.6101	4.2452	3.5743	3.2401	0.5426
	(1.64)	(1.54)	(0.88)	(1.20)	(0.76)	(0.12)
Observations	267	267	267	267	267	267
R-squared	0.184	0.142	0.116	0.171	0.124	0.110
Adjusted R-squared	0.124	0.0797	0.0519	0.111	0.0607	0.0452
F-Test	3.098***	2.280***	1.809**	2.851***	1.956**	1.699**
	(0.0000)	(0.0027)	(0.0248)	(0.0001)	(0.0127)	(0.0399)

Equation 1, with the variable *Own* excluded from the model and replaced by two new variables, *Own*<50 % and *Own*≥50%. The piecewise linear regression was estimated for the dependent variable (CAR), □ which in turn was estimated from either the market model or market-adjusted model, across different event windows. The new variables *Own*<50% and *Own*≥50% allowed change of slopes at 50 per cent. The cut-off point at 50 per cent family ownership was used based on the overall estimates of the non-linear relationship between family ownership and CAR reported in Table 4.The following new variables were used to estimate and report the results of piecewise linear regressions:

Own<50% = family ownership if family ownership < 50%; and
= 50 if family ownership ≥ 50%
Own≥50% = 0 if family ownership < 50%; and
= family ownership minus 50 if family ownership ≥ 50%

Results from Columns (1) and (3) of Table 6 again support Hypothesis 2 – there is a non-linear relationship between family ownership and CAR. A 5 per cent significance level for the coefficient of *Own*≥50% is show in in columns (1) and (3) of Table 6. This is again consistent with results shown in Tables 4 and 5.The results indicate a significant non-linear relationship between family ownership and CAR. The benefit of family ownership tapered off when family ownership reached a concentrated level at 50 per cent equity shareholdings in family-controlled Malaysian firms.

Table 6. Non-linearity between family-controlled Malaysian acquirers' cumulative abnormal returns $\overline{CAR}$ and family ownership: piecewise regression model

$$CAR_i = \alpha_i + \beta_{i1}\, Own{<}50\%_i + \beta_{i2}\, Own{\geq}50\%_i + \beta_{i3}\, FamilyCEO_i + \beta_{i4}\, Fam\_Ind_i + \beta_{i5}\, F\_Dual_i + \beta_{i6}\, DualCEO_i + \beta_{i7}\, Ind\_Director_i + \beta_{i8}\, Rpa_i + \beta_{i9}\, Firmyear_i + \beta_{i10}\, Pre\_CAR_i + \beta_{i11}\, non\_related_i + \beta_{i12}\, FCF_i + \beta_{i13}\, LN\_MVEi + \beta_{i14}\, LN\_RM_i + \beta_{i15}\, Crossborder_i + \beta_{i16}\, Public_i + \beta_{17}\, Equity_i + \beta_{18}\, Yr08\_11_i + \varepsilon_i$$

The sample comprises 267 observations. The observations denote 267 corporate acquisition announcements made by 129 family-controlled Malaysian firms listed on the Main Board of Bursa across the sample period between 2002 and 2011. The reported dependent variable – CAR is regressed against the independent variables and control variables for each model from columns (1)-(6). Columns 1, 2 and 3 report the CAR that were estimated using the market model. Columns 4, 5 and 6 report the CAR that wre estimated from the market adjusted model. The CAR denotes cumulative abnormal returns over an event window for each observation. The reported CAR estimated from both the market model and the market adjusted model are cumulated over a three-day event window (-1, +1), five-day event window (-2, +2) and seven-day event window (-3,+3), respectively. Day 0 denotes the day of corporate acquisition announcement release. The numbers in parentheses denote the standard error. The *,**, and *** stand for statistical significance based on two-wide tests at the 10%, 5%, 1% levels, respectively. The variable *Own*< 50% equals to *Own* when *Own*<50; and equals to 50 when *Own* ≥ 50%. The variable *Own* ≥ 50% equals to zero if *Own*<50; and equals to *Own* minus 50 if *Own*≥50. The variable *Own* denotes total family equity ownership as measured by total percentage of equity ownership in the company. The variable *FamilyCEO* denotes a dummy variable that equals to one when family member of the controlling family is the CEO, zero otherwise. The variable *Fam_Ind* denotes a dummy variable that equals to one when the ratio of total number family members on board over total numbers of independent directors on board is more than 1, zero otherwise. The variable *DualCEO* denotes a dummy variable that equals to one when the position of CEO and chairman are both held by the same individual, zero otherwise. The variable *Ind_Director* denotes the total percentage of independent director on the board. The variable Rpa denotes a dummy variable

that equals to one when the acquisition is a related party corporate acquisition, zero otherwise. The variable *Firmyear* denotes the firm age of the company. The variable *Pre_CAR* denotes an acquirer's pre-announcement stock price run-up, which is measured by cumulative abnormal returns over the 200-day window (event day -210 to day -11) and is estimated using market model. The variable *non_related* denotes a dummy variable that equals to one when target is not within the same industry as the industry of the acquirer, zero otherwise The variable *FCF* denotes free cash flow ratio that is measured by Operating Income + Depreciation – Interest expense – Taxes – Preferred dividend – Common dividend / Total Assets . The variable *LN_MVE* denotes firm size that is measured by log of market capitalisation. The variable *LN_RM* denotes transaction size that is measured by the log of transaction dollar value of the acquisition in Malaysian Ringgit currency. The variable *Crossborder* denotes a dummy variable that equals to one for the acquisition of non-domestic target, zero otherwise. The variable *Public* denotes a dummy variable that equals to one for acquisition of public target, zero otherwise. The variable *Equity* denotes a dummy variable that equals to equity-financed acquisition, zero otherwise. The variable *Yr08_11* denotes a dummy variable that equals to one when the year of the event is during the period of 2008-2011, zero otherwise.

	Market Model			Market Adjusted Model		
CARs	(-1,+1)	(-2,+2)	(-3,+3)	(-1,+1)	(-2,+2)	(-3,+3)
Own < 50%	0.0425	0.0782*	0.0193	0.0351	0.0697	0.0175
	(1.28)	(1.72)	(0.39)	(1.04)	(1.53)	(0.36)
Own ≥ 50%	-0.0619**	-0.0447	-0.0317	-0.0607**	-0.0416	-0.0308
	(-2.17)	(-0.87)	(-0.56)	(-2.08)	(-0.77)	(-0.56)
FamilyCEO	0.8705	1.3177	1.2769	0.5788	1.1240	1.0092
	(1.20)	(1.30)	(1.21)	(0.76)	(1.09)	(0.99)
Fam_Ind	-1.3720**	-1.3707*	-0.3426	-1.3172**	-1.3659*	-0.3404
	(-2.57)	(-1.71)	(-0.35)	(-2.44)	(-1.72)	(-0.36)
F_Dual	-0.5808	-1.8465**	-1.5152	-0.4616	-1.8280**	-1.3936
	(-0.99)	(-2.30)	(-1.61)	(-0.78)	(-2.31)	(-1.49)
DualCEO	-0.7786	-0.1794	-0.3399	-0.7977	-0.2386	-0.4531
	(-1.34)	(-0.19)	(-0.33)	(-1.36)	(-0.25)	(-0.44)
Ind_Director	-0.0853***	-0.1202***	-0.1214***	-0.0798***	-0.1088***	-0.1038***
	(-4.01)	(-4.62)	(-3.62)	(-3.68)	(-4.30)	(-3.27)
Rpa	-0.8345*	-1.3898**	-1.4724**	-0.9987**	-1.5878**	-1.7452**
	(-1.77)	(-2.20)	(-2.13)	(-2.04)	(-2.46)	(-2.59)
Firmyear	0.0230*	0.0326*	0.0466**	0.0165	0.0212	0.0324
	(1.84)	(1.88)	(2.16)	(1.26)	(1.19)	(1.60)
Pre_CAR	0.0144	0.0146	0.0133	0.0139**	0.0160*	0.0179*
	(0.85)	(0.76)	(0.57)	(2.17)	(1.94)	(1.93)
non_related	-1.2601*	-0.5532	-0.8842	-1.3323*	-0.7586	-1.1458
	(-1.71)	(-0.62)	(-0.79)	(-1.76)	(-0.84)	(-1.03)
FCF	-1.4725	2.4733	8.5297	-2.5552	0.1011	5.7339
	(-0.28)	(0.34)	(1.03)	(-0.48)	(0.01)	(0.71)
LN_MVE	-0.1028	-0.1494	0.0241	-0.0556	-0.1079	0.0518
	(-0.67)	(-0.59)	(0.09)	(-0.35)	(-0.41)	(0.19)
LN_RM	-0.2417*	-0.2352	-0.3147	-0.2157*	-0.1412	-0.1905
	(-1.96)	(-1.27)	(-1.35)	(-1.79)	(-0.78)	(-0.83)
Crossborder	-1.5275***	-1.9429***	-1.4247*	-1.4600***	-1.8451***	-1.1845
	(-3.39)	(-2.96)	(-1.72)	(-3.21)	(-2.87)	(-1.43)

Public	-0.8665	-0.1372	0.0473	-0.7005	-0.0207	0.0433
	(-1.35)	(-0.14)	(0.04)	(-1.06)	(-0.02)	(0.04)
Equity	0.6032	1.5327	0.3691	0.7172	1.7860	0.7293
	(0.72)	(1.23)	(0.27)	(0.86)	(1.44)	(0.54)
Yr08_11	-0.8843**	-0.6536	-0.3609	-0.7449*	-0.5377	-0.2935
	(-2.13)	(-1.11)	(-0.54)	(-1.79)	(-0.92)	(-0.45)
Constant	9.4457***	8.1712**	8.2507*	8.3300***	6.1112	5.7076
	(3.42)	(2.07)	(1.70)	(2.90)	(1.53)	(1.18)
Observations	267	267	267	267	267	267
R-squared	0.184	0.151	0.112	0.178	0.146	0.104
Adjusted R-squared	0.125	0.0895	0.0471	0.118	0.0840	0.0388
F-Test	3.370***	2.606***	2.096***	2.663***	2.142***	1.686**
	(0.0000)	(0.0005)	(0.0066)	(0.0004)	(0.0053)	(0.0423)

4. Conclusion

Based on the results, Hypothesis 1 and Hypothesis 2 were rejected. Results provided strong support on the non-linear relationship between family ownership and firm value. Regulators and policymakers may need to undertake further research on this matter. Considerations restricting the concentration of power in the hands of the family may need to be given for the benefit of investors not related to the family. The results support the notion that family-controlled Malaysian firms do perform value-enhancing corporate acquisition activities. However, when the opportunity to expropriate arose, abuse of power occurred. This was observed based on the results reported in this paper, in the context of corporate acquisitions for family-controlled Malaysian firms.

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Appendix : Summary table describing the measurements for the dependent, independent and control variables

Dependent Variable	
CAR_i	: Cumulative abnormal returns over the event window
Independent Variables and Control Variables	
Own	: Total family equity ownership as measured by total percentage of equity ownership in the company
FamilyCEO	: Dummy variable that equals to one when family member of the controlling family is the CEO, zero otherwise.
Fam_Ind	: Dummy variable that equals to one when the ratio of total number of family members on board over total number of independent directors on board is more than one, zero otherwise.
DualCEO	: Dummy variable that equals to one when the position of CEO and chairman are both held by the same individual, zero otherwise
F_Dual	: Dummy variable that equals to one when two related family members hold the position of CEO and chairman respectively, zero otherwise
Rpa	: Dummy variable that equals to one for related party acquisition, zero otherwise
Ind_Director	: Total percentage of independent directors on the board
Firmyear	: Age of the company
Pre_CAR	: Acquirer's pre-announcement stock price run-up is measured by cumulative abnormal return over the 200-day window (event day -210 to day -11) and is estimated using market model
non_related	: Dummy variable that equals to one when target is not within the same industry as the industry of the acquirer
FCF	: Free cash flow ratio that is denoted by (Operating Income + Depreciation – Interest expense – Taxes – Preferred dividend – Common dividend) / Total Assets
LN_MVE	: Firm size denoted by log of market capitalisation
LN_RM	: Transaction size denoted by the log of transaction dollar value of the acquisitions in Malaysian Ringgit
Crossborder	: Dummy variable that equals to one for acquisition of non-domestic target, zero otherwise
Public	: Dummy variable that equals to one for acquisition of private target, zero otherwise
Equity	: Dummy variable that equals to one for equity-financed acquisition, zero otherwise
Yr08_11	: Dummy variable that equals to one when the year of the event is during the period of 2008-2011, zero otherwise