國 立 交 通 大 學

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為何股票能在高系統性風險事件下優於大盤

— 企業成長策略之觀點

Why the Stocks Can Outperform the Market Following the Black Events:

From the Perspective of the Growth Strategy

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摘要

過去文獻指出，公司成長策略與市場評價之間抱持兩種相反的假說：「資訊不對稱假說」以及「綜效理論」。雖然這些文獻比較多角化公司與聚焦化公司差異，但卻無法得到決定性的一致結論。本研究觀察在高系統風險事件下，比較兩種成長策略的差異，以及一間企業的多角化程度與市場評價之間的關係。結果一致性的支持「資訊不對稱假說」，顯示多角化公司的市場評價較低；企業多角化程度越高，市場給予的評價越低。此外，本研究更進一步去觀察發生高系統風險事件後，企業多角化程度的改變與市場評價，發現多角化程度增加之公司相較於未改變之公司得到較差的市場評價。最後，本研究使用不同的多角化衡量方法使得研究具穩健性，並且結論一致性的支持「資訊不對稱假說」。

關鍵字：成長策略、多角化、市場評價、黑色事件

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Abstract

According to previous studies, two competing arguments exist in explaining the relation between diversification and the market value, namely, the “information asymmetry hypothesis” and the “theory of synergy”. Although there is a substantial literature that compares diversified firms to focused firms, this literature has not reached a decisive conclusion. In this paper, we investigate whether the market's valuation of a firm is correlated with its degree of diversification following the “black events”. The results are consistent with the “information asymmetry hypothesis”, and show significantly negative relation between the degree of corporate diversification and Tobin’s Q, even after controlling for other determinants. We show further that diversified firms have lower Q's and BHARs than equivalent portfolios of focused firms. And firms that increase their number of segments have significantly lower Q's than firms that keep their number of segment constant after the black event happened. Overall, our main findings are robust to various measures in diversification, and our evidence is consistent with the “information asymmetry hypothesis”

Key words: Growth Strategy; Diversification; Tobin’s Q; Black Event

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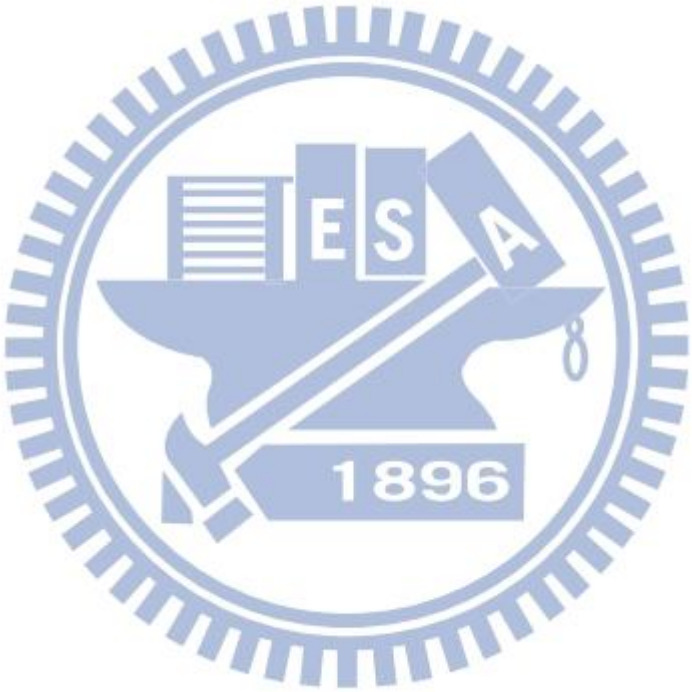
目　　錄

表　　目　　錄

圖　　目　　錄



1. Introduction

Market efficiency hypothesis argues that markets are rational and the prices fully reflect all available information. Due to the timely actions of investors prices of stocks quickly adjust to the new information, and reflect all the available information; therefore, no investor can beat the market by generating abnormal returns. However, it is found in many stock exchanges of the world that these markets are not following the rules of EMH. The functioning of these stock markets deviate from the rules of EMH, and thus deviations are called anomalies. According to George & Elton (2001), anomalies are defined as irregularity or a deviation from common or natural order or an exceptional condition. While in standard finance theory, financial market anomaly means a situation in which a performance of stock or a group of stocks deviate from the assumptions of efficient market hypotheses. Such movements or events which cannot be explained by using efficient market hypothesis are called financial market anomalies.

There are a lot of researches done on the existence of various types of anomalies. From the perspective of the market environment, we can find that some investors can beat the market and generate abnormal returns. Different authors segregated anomalies into three main types: calendar anomalies, fundamental anomalies and technical anomalies. Calendar anomalies exist due to deviation in normal behaviors of stocks with respect to time periods, including weekly effect, January effect, and Turn-of-the-Month Effect. Another type is fundamental anomalies that prices of stocks are not fully reflecting their intrinsic values, including dividend yield anomaly, price to earnings ratio anomaly and low price to book anomaly. Technical anomalies are based upon the past prices and trends of stocks; for example, momentum effect.

Technical anomalies also include trading strategies like moving averages and trading breaks which includes resistance and support level (Madiha Latif, Shanza Arshad, Mariam Fatima, and Samia Farooq, 2011).

Form the prospect of business operations, there are also many studies done on anomalies; for instance, size effect and corporate governance. In terms of size and market valuation, size effect, which is the most prevalent theory proposed by Fama and French (1992), argues that investors demand higher return due to the higher risks of smaller firms. However, the theory is still subject to counter arguments and debates. Fernandes and Ferreira (2007) find a significantly negative relation between size and Tobin's Q (hereafter, Q), whereas Moses (1987) proves that size and Q are positively correlated. Thus, both directions between size and market valuation are possible. As for corporate governance, Sanjai Bhagat and Brian Bolton (2008) found that better governance is significantly positively correlated with better contemporaneous and subsequent operating performance.

Ansoff (1957) first used the term "diversification" to illustrate corporate growth strategies. And the most researched linkage in the strategic management literature is that involving diversification and performance (Leslie E. Palich, Laura B. Cardinal, and C. Chet Miller, 2000; Sheng-Syan Chen, 2006). Growth strategies (i.e., organizational form), focus versus diversification, become more and more important since these growth strategies play a vital role in explaining the valuation effects on firms. A number of studies have carefully investigated how growth strategy exerts an effect on Q (e.g., Bhagat, Shleifer, and Vishny, 1990; Berger and Ofek, 1996; Servaes, 1996; and Heron and Lie, 2002).

Diversification is defined both narrowly and broadly. As Villalonga (2004) points out, SFAS 14[1] defines a segment as "a component of an enterprise engaged in providing a product or service or a group of related product and services primarily to unaffiliated customers for a profit." Furthermore, Ramanujam and Varadarajan (1989) define diversification as "the entry of a firm or business unit into new lines of activity, either by process of internal business development or acquisition, which entails changes in its administrative structure, system, and other management processes." Lim, Thong, and Ding (2008) use three methods to measure the degree of diversification, namely, the number of segments in a corporation, Herfindahl index (HI) from sales, and diversification dummy. All these measurements are narrow definitions of diversification. In the current study, we selected all of the three narrow definitions to analyze the diversification of a company. Thus, we would like to clarify that in this work, "segment" is used instead of "subsidiary" for diversification.

Lang & Stulz (1994)；Berger & Ofek (1995) explain the corporate diversification discount; they found that diversified firms trade at a discount relative to focused firms in the same industries. As mentioned by Wernerfelt and Montgomery (1998), Lang and Stulz (1994), Servaes (1996), Chen (2006), Chen (2008), and others, focused firms tend to exhibit better investment opportunities than diversified firms. The fundamental argument made against corporate diversification is that it somehow exacerbates managerial agency problems. Inefficient investments due to cross-subsidization between divisions can exist in diversified firms. Shin and Stulz (1998) and Rajan et al. (2000) find evidence of inefficient diversion of corporate resources from divisions with good investment opportunities to failing divisions. Therefore, agency problems have been proposed as an explanation for the

[1] A formal document issued by the Financial Accounting Standards Board (FASB), which details accounting standards and guidance on selected accounting policies set out by the FASB. The standards are created to ensure a higher level of corporate transparency.

diversification discount effect, and the negative impacts of corporate diversification can be referred to the agency cost hypothesis. Also, managers frequently cite the desire to mitigate asymmetric information as a motivation for increasing firm focus (Jonathan E. Clarke, C. Edward Fee, and Shawn Thomas, 2004). Diversified firms are subject to larger asymmetric information problems than are focused firms, and diversified firms operate with less efficiency.

On the other hand, Villalonga (2004) uses new database (Business Information Tracking Series) and finds the diversification premium. Besides, the premium is robust to variation in the sample, business unit definition and measures of excess value and diversification. Indeed, the management in diversified firms can broaden their internal capital market and acquire these economies by diversifying. For instance, a diversified firm can bypass the external capital market by shifting funds from business segments with poorer investment opportunities to business segment with better investment opportunities. This suggests that diversified firms allocate resources more efficiently. Morck and Yeung (1998) propose the theory of synergy, indicating that the benefits of synergy come from the existence of valuable information-based assets within the firm. According to Thomas (2002), diversified firms have potential information benefits of diversification. Aggarwal and Samwick (2003) also report that the advantage of diversification outweighs its drawback.

As mentioned previously, Villalonga (2004) use a new database (Business Information Tracking Series) and finds the diversification premium which is robust to variation in the sample, business unit definition, and measures of excess value and diversification. According to Morck and Yeung (1998), the theory of synergy indicates that diversification contributes the value of market. However, earlier studies, such as Lang and Stulz (1994), find that Q and firm diversification are negatively

related because of diversification discount, that is, firms operate with less efficiency. Berger and Ofek (1995) claim that diversified firms trade at a discount relative to single-segment firms in the same industries. This phenomenon might be attributed to agency cost for outside investors due to information asymmetry. Therefore, the relation between diversification and market valuation is still inconclusive.

The 20th anniversary of what came to be known as "Black Monday"—19 October 1987—provides a memorable platform for considering, yet again, the role of risk in our financial markets (John C. Bogle, 2008). On that single day, the Dow Jones Industrial Average dropped from 2,246 to 1,738, an astonishing decline of almost 25 percent. In fact, during 2007, we witnessed an unprecedented series of amazing market swings, known as financial tsunami. Whereas in the 1990s and 2000s, the daily changes in the level of stock prices typically exceeded 5 percent only one time or two times a year. For example, the Asian financial crisis, internet bubble, Enron financial scandal, the September 11, 2001 *terrorist attacks*. In this paper, we call these events with rarity, extremeness, and retrospective predictability "Black Events". Refer to "Black Monday," the definition of "Black Events" is that the Dow Jones Average Index fell over 5% (greater than 5%) in one day. These stunning declines shocked nearly all market participants, although some veterans were not surprised, outperformed the market even. As a result, these big-shock events provided an opportunity to examine the role of growth strategy in explaining the benefit to the market valuation.

A number of studies discuss the relation between diversification and the firm value. Moreover, this study wants to see the difference of growth strategy in special condition, as called "Black Events". This study contributes to the literature by examining the importance of focus versus diversification in explaining the value from

market following the black event. In a sample of 534 outperformed firms from 2002 to 2004, our findings indicate that long-run valuation effect (BHARs) of corporate growth strategy is differentiated. Our evidence leads to the conclusion that there is a negative relation between Q and diversification. The reason for this relation does not appear to be that good firms diversify and therefore become bad firms. In our sample, there is some evidence that multi-segment firms are firms with lower Q's relative to other focused firms but not relative to firms in their industry. This evidence could imply that firms diversify when they no longer have growth opportunities in their industry or that the market anticipates ill-fated diversification and already impounds it in the firm's value.

Our results are important for two specific reasons. At first, there has been no empirical evidence on the role of growth strategy in explaining the value from market following the black event. Furthermore, by taking into account the issue on the effect of focus and diversification on the value from market following the black event, this study also adds to existing literature on whether the nature of growth strategy is an important consideration in assessing the value from market. Our main findings are robust to different measures in diversification.

Figure 1 shows this paper's background about the relationship between diversification and market valuation. Apparently, both signs are possible for each study. Previous studies might point out either positive or negative relation between diversification and Q. However, such results might be biased or distorted due to the failure to consider other variable. Here, we use a broader perspective to examine the whole picture of diversification and market valuation.

The remainder of this paper is organized in sections. Section 2 explains the methodology, including the sample selection, variable definitions and model. Section

3 presents the empirical results and findings on the value from market. Finally, section 4 provides the summaries and conclusions.

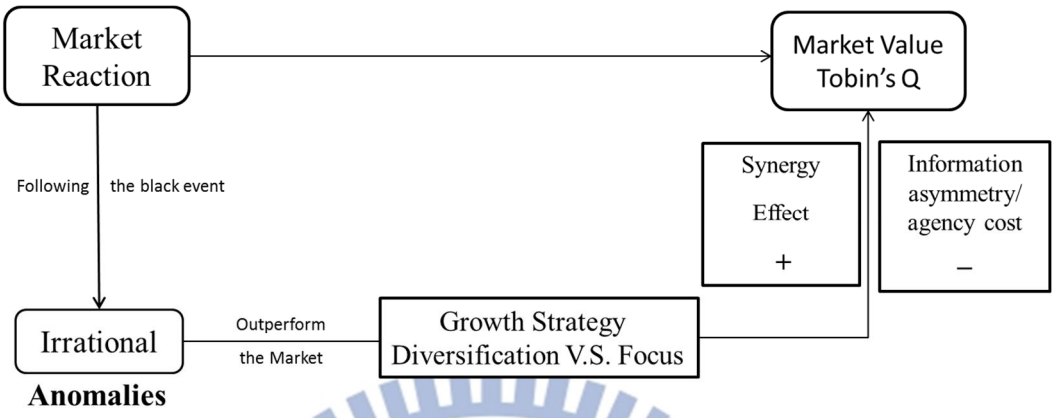


Figure 1.The main purpose and hypothesis of this paper

2. Methodology

2.1. Data Source

This section describes the data sources that we use to conduct our study. As previous sections mention, there are several black events happened in these years. Financial scandals, like Enron, disclosure that the corporate managers engaged in earnings manipulation and accounting irregularities to inflate the stock price and gain from their equity and options holdings. Finally, in 2001, many of the corporate law reforms enacted in the United State have come as a response to corporate scandals. In the same time, terrorist attacked the United State and shocked the market. As a result, we collect an initial sample between January 2002 and December 2004. Stock prices from the original sample were collected from the Center for Research on Security Prices (CRSP).

The main stock exchanges in United State are NASDAQ, NYSE, and AMEX. NASDAQ has established itself as an indicator of the performance of stocks of technology companies and growth companies. The data collected from three individual stock exchange websites indicate that NASDAQ has the biggest percentage of technology firms (see **Table 1**). A previous study has shown that investors are periodically overoptimistic as regards the earnings potential of young growth companies (Loughran & Ritter, 1995). As a result, issuers can report unusually high earnings by adopting discretionary accounting accruals adjustments that raise reported earnings relative to actual cash flows (Teoh, Welch, & Wong, 1998). We speculate that the possibilities of these firms are higher. Therefore, it's easier to see the relation between growth strategy and market value. Thus, the current study focuses on

NASDAQ, and data we use were collected from Compustat Industry Segment (CIS) database and Wharton Research Data Services (WRDS).

Table 1 Number and percentage of company in each industry among three main stock exchanges

Stock Exchange	NASDAQ		NYSE		AMEX		ALL	
Statistic	No.	%	No.	%	No.	%	No.	%
Basic Industries	78	2.77	191	5.89	74	14.02	343	5.21
Capital Goods	202	7.18	186	5.73	31	5.87	419	6.36
Consumer Durables	253	8.99	104	3.21	31	5.87	388	5.89
Consumer Non-Durables	124	4.40	122	3.76	22	4.17	268	4.07
Consumer Services	345	12.26	413	12.73	45	8.52	803	12.19
Energy	103	3.66	213	6.57	39	7.39	355	5.39
Finance	600	21.31	468	14.43	25	4.73	1,093	16.59
Health Care	232	8.24	88	2.71	30	5.68	350	5.31
Miscellaneous	87	3.09	47	1.45	4	0.76	138	2.10
Public Utilities	89	3.16	225	6.94	11	2.08	325	4.93
Technology	514	18.26	142	4.38	29	5.49	685	10.40
Transportation	57	2.02	59	1.82	0	0.00	116	1.76
N/A	131	4.65	986	30.39	187	35.42	1,304	19.80
TOTAL	2,815	100	3,244	100	528	100	6,587	100

2.2. Long-Run Stock Performance Following the Black Events

As mentioned by previous studies, measuring long-run stock returns remains heavily debated in the asset pricing literature (e.g., Barber and Lyon, 1997; Fama, 1998; Loughran and Ritter, 2000; and Michell and Stafford, 2000).

2.2.1. Buy-and-Hold Abnormal Returns (BHARs)

We calculate the buy-and-hold abnormal returns (BHARs) relative to one benchmark: the CRSP Nasdaq value-weighted market index. More specifically, the sample firm *i*'s buy-and-hold abnormal returns following the black events can be expressed as equation (1):

$$BHAR_{i,T} = \prod_{em=1}^{T}(1 + R_{i,em}) - \prod_{em=1}^{T}(1 + R_{b,em}) \quad (1)$$

where $R_{i,em}$ is the monthly return of the sample firm i in event month em during T-month post-investment period, with the first month (January) after the black event year happened being defined as month 0; and $R_{b,em}$ is the monthly return of the benchmark over the same period.

Following Berger and Ofek (1995), Comment and Jarrell (1995), John and Ofek (1995), Denis et al. (1997), Hadlock, Ryngaert, and Thomas (2001), Chen (2006), and Chen (2008), we partition our overall sample into two subsamples based on whether the outperformers are single-segment firms (i.e., focused firms) or multi-segment firms (i.e., diversified firms). We than compare the outperformers' BHARs between single-segment firms (i.e., focus firms) and multi-segment firms (i.e., diversified firms).

The initial sample comprises firms with BHARs > 0, and our final sample is conducted by the following criteria:

(1) According to Jiraporn, Kim and Mathur (2008), the financial industry (SIC codes 6000-6999) and the utility industry (SIC code 4900-4999) are excluded due to government regulations.

(2) We exclude ADR companies.

(3) Outperformed firms must have three-year stock return information available from the Center for Research in Securities Prices (CRSP) return files ex post the black event.

(4) Finally, outperformed firms must have three-year accounting and operating information and business-segment information available from COMPUSTAT files.

The final sample contains 244 focused firm data and 290 diversified firm data on the specified period.

Table 2 shows the mean and median buy-and-hold abnormal returns (BHARs) during 3-year (36-month) post-investment period following the black event for single-segment firms and multi-segment firms. And we find that single-segment firms have higher BHARs than diversified firms.

Table 2 BHAR Adjusted by CRSP Nasdaq Value-Weighted Market Return

This table reports the mean and median buy-and-hold abnormal returns (BHARs) during 3-year (36-month) post-investment periods following the black event for single- and multi-segment outperformers. The final sample consists of 534 outperformers during the period 2002-2004. To identify the organizational form for each outperformer, we partition our overall sample into two subsamples based on whether the outperformers are single-segment firms or multi-segment firms.

BHAR Adjusted by CRSP Nasdaq Value-Weighted Market Return

Variables	Single-Segment Firms N=244		Multi-Segment Firms N=290	
	Mean	Median	Mean	Median
$BHAR_{[t+1,t+36]}$	1.8982	0.8566	1.7894	0.9428

Table 3 presents the sample distribution by the industry type (high- and low-tech industry) and corporate growth strategy. The high- and low- technology industries are categorized by following that of Brown, Fazzari, and Peterson (2009). Table 3 shows that most of outperformed firms, either single- or multi-segment firms, can be found in the high-tech industry. In High-Tech industry, there are more focused firms than

diversified firms; on the other hand, there are more diversified firms in Low-Tech industry instead.

Table 3 Sample Distribution by Industry Type and Growth Strategy

This table summarizes the sample distribution by industry type and growth strategy. The final sample consists of 534 outperformers during the period 2002-2004. To identify the organizational form for each outperformer, we partition our overall sample into two subsamples based on whether the outperformers are single-segment firms or multi-segment firms. Data on business segment is from WRDS business-segment files. The high- and low-technology industry types are categorized by following that of Brown, Fazzari, and Peterson (2009).

Sample Distribution by Industry Type and Growth Strategy

Industry Type	Total	Percent of Sample	Single-Segment Firm	Muliti-Segment Firm
High-Tech	320	0.60	172	148
Low-Tech	214	0.40	72	142

2.3. Definition of variables

2.3.1. Growth Strategy ─ the measurements of diversification

To identify the growth strategy of each outperformer, we used three measurements of diversification by following Lim, Thong and Ding (2008). The three measures we conducted are as follows: (1) the number of segments, measured as the sum of the number of business segment in each outperformed firm for the fiscal year. Data on the number of business segments, the segment's revenue, and the segment's information are obtained from COMPUSTAT database and Wharton Research Data Services (WRDS). Similarly, the greater number signifies a higher level of diversification. In the second measurement, we used (2) the revenue-based Herfindahl index[2], which is a continuous measure that takes higher values with higher level of

[2] $HI_i = \sum_{j=1}^{N_i} (Sale_{i,j} / \sum_{j=1}^{N_i} Sale_{i,})^2$

Where N_i is firm i's total number of business segments and $Sale_{i,j}$ is the firm i's sales attributable to segment j.

diversification. This is a standard method in the strategy and economics literature on diversification (Villalonga, 2004). We calculate as the sum of the squares of each segment's revenue as a proportion of outperformed firms' total revenue, after which the inverse of its value was used to easily judge its degree of diversification (i.e., the index equals one for single-segment firm and is smaller than one for multi-segments firms). We compute the sum of squares of each segment's sales to total sales of the company and then use the inverse of its value in order to easily judge its degree of diversification. That is, the index equals one for single-segment firm and is larger than one for multi-segments firms. Hence, the bigger of the number indicates the higher level of diversification. The third measurement involves the number of segments engaged in a company. We collected (3) dummy for multi-segment firms, which equals zero if there is only one segment and equals one if there are more than two segments (Ruland and Zhou 2005). As defined by SFAS 14, a segment is "a component of an enterprise engaged in providing a product or service or a group of related products and services primarily to unaffiliated customers (i.e., customers outside the enterprise) for a profit.''

2.3.2. Tobin's Q

When accessing the firm performance, previous studies have used accounting numbers or stock market return. As Lang and Stulz (1994) point out, this "ex post" methods suffer from two problems, namely, the choice of benchmark for comparisons, which might cause different resluts and the use of adjustment of stock returns for risk. If the risk is not adjusted, a number of firms would perform better, simply because they can bear greater risk. Such phenomenon might distort the evaluation of firm performance. Q, on the other hand, avoids the disadvantages of ex post method

because it measures firm performance at a point in time that does not require risk adjustment. Furthermore, Q also contains the capitalized value of the benefits from diversification (Lang & Stulz, 1994).

Similar to Lang and Stulz (1994), Villalonga (2004), and Fernandes and Ferreira (2007), we defined Q as the following equation (2): market value of common equity, plus total assets, minus the book value of common equity, divided by total assets.

$$Q=\frac{Market\ value\ of\ common\ stock+Book\ value\ of\ debt\ and\ preferred\ stock}{Book\ value\ of\ assets} \quad (2)$$

2.3.3.Other Control Variables

Following Yoon K. Choi (2011), Kim, et al. (1998), Vishal Gaur and Saravanan Kesavan (2007), Pornsit Jiraporn, Young Sang Kim , Ike Mathur (2008), we consider the following control variables, which might be determinants of the value of corporate strategy:

(1) Size: we measured firm size as the logarithm of the total assets.

(2) Liquidity: we measured *liquidity* as a firm's cash and equivalents (e.g., cash and marketable securities) in a specific year divided by the book value of total assets in that same year.

(3) Sales Growth: Sales Growth Rate $=\frac{Sales_t-Sales_{t-1}}{Sales_{t-1}}$

(4) Capex ratio: Capex ratio measured as the ratio of capital expenditures to total sales.

(5) ROA: we define firm profitability using the accounting-based measure, return on assets (ROA).

(6) Leverage: debt ratio measured as the ratio of the book value of total debt over total assets for the year preceding the announcement.

2.4. Model

The purpose of this study is to ascertain whether corporate diversification puts a premium or a discount on market value. To examine the relation between diversification and Q, we adopted the following cross-sectional regressions:

Q=f (Diversification, Size, Liquidity, Sales Growth, Capex, ROA, Leverage)

where Q = Tobin's Q; Diversification, with three measurements: SEG or the number of segment offered by COMPUSTAT, 1/HI or the inverse of Herfidahl index, and DUMMY, with the variable equals one if the firm operates in multiple segments, and zero otherwise. We also employed a few control variables, as suggested by previous studies (e.g., Yoon K. Choi, 2011; Kim, et al., 1998; Vishal Gaur and Saravanan Kesavan, 2007; Pornsit Jiraporn, Young Sang Kim, and Ike Mathur, 2008).

3. Empirical Results

3.1 Descriptive Statistics

The descriptive statistics are shown in **Table 4**. Table 4 also presents firm characteristics as well information about outperformers. Of particular interest in our analysis is the relative performance of multi-segment and single-segment firms. The sample consists of 1,602 observations, of which, 732 are from single-segment firms and 870 from multi-segment firms. A quick comparison between the single- and multi-segment samples reveals that single-segment firms tend to be smaller, possess more growth opportunities (i.e., higher sales growth rate), and leverage less. For instance, the average (median) ln assets is 4.6161 (4.5490) for single-segment firms while multi-segment firms have 5.0567 (5.0647). Another example would be the average (median) sales growth rate which is 25.48% (14.10%) for the single-segment firms and 17.02% (9.57%) for the multi-segment firms. Furthermore, the average (median) debt ratio is only 34.25% (28.96%) for the single-segment firms and 42.31% (39.22%) for the multi-segment firms. These observations are comparable to research done by Berger and Ofek (1995), Hadlock, Ryngaert, and Thomas (2001), Chen (2006), and Chen (2008).

Table 4 Descriptive Statistics

Descriptive statistics on variables for our sample of firms are from 2002-2004([t+1, t+3]). To identify the growth strategy for each outperformer, we partition our overall sample into two subsamples based on whether the outperformers are single-segment firms (i.e., focused firms) or multi-segment firms (i.e., diversified firms). Q stands for Tobin's Q and its numerator is computed as book value of total assets and the market value of equity; the denominator is total assets. # of Segment is the number of segment in a company collected from WRDS. HI (herein,"1/HI") is the Herfindahl Index which is computed based on revenues generated from different segments in a firm. ln assets is the logarithm value of total assets. Liquidity is the ratio that cash and equivalents in a specific year divided by the book value of total assets in that same period. Sales Growth Rate is defined as the annual sales growth rate. Capex is the ratio of capital expenditures to total sales. Leverage is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability.

Variables	Single-Segment Firms N=732			Multi-Segment Firms N=870		
	Mean	Median	Std Dev	Mean	Median	Std Dev
$Q_{[t+1,t+3]}$	3.0338	2.2128	2.9128	1.9620	1.5484	7.2893
# of $segment_{[t+1,t+3]}$	1	1	0	4.3805	4	2.0832
$HI_{[t+1,t+3]}$	1	1	0	2.3944	2.0438	1.1342
ln $Asset_{[t+1,t+3]}$	4.6161	4.5490	1.4120	5.0567	5.0647	1.3728
$Liquidity_{[t+1,t+3]}$	0.3247	0.2855	0.2440	0.2014	0.1347	0.2021
Sales $Growth\ Rate_{[t+1,t+3]}$	0.2548	0.1410	0.8389	0.1702	0.0957	0.7450
$Capex_{[t+1,t+3]}$	0.1088	0.0299	0.5069	0.0592	0.0297	0.1442
$ROA_{[t+1,t+3]}$	-1.1783	4.8390	2.2064	2.4007	4.5730	1.8280
$Leverage_{[t+1,t+3]}$	0.3425	0.2896	0.2307	0.4231	0.3922	0.2294

3.2 t-test for mean of two subsamples.

Table 5 presents selected features of the sample firms and the t-test for the two subsamples, focused and diversified. In terms of size, the diversified firms are significantly larger than the focused firms. The liquidity of single-segment firms (32.47%) is significantly higher than that of the diversified firms (20.14%). The sales growth rate and capex ratio are also is significantly higher than that of the diversified firms. The leverage ratio of the diversified firms (42.31%) is significantly higher than that of the single firms (34.25%). The diversified firms have higher profitability that

ROA is significantly higher than that of the focused firms. Moreover, the diversified firms have lower Q (1.962) than focused firms (3.0338) at 1% level, implying that diversified firms are likely putting a discount on market value. This result is consistent with Larry H.P. Lang and René M. Stulz (1994), and Kimberly C. Gleason et al. (2011).The t-test used the mean to determine any significantly difference.

Table 5 t-test for mean of two subsamples

Variables for our sample of firms are from 2002-2004([t+1, t+3]). Focused stands for company with only one segment; diversified for more than two segments. Q stands for Tobin's Q and its numerator is computed as book value of total assets and the market value of equity; the denominator is total assets. # of Segment is the number of segment in a company collected from WRDS. HI (herein,"1/HI") is the Herfindahl Index which is computed based on revenues generated from different segments in a firm. ln assets is the logarithm value of total assets. Liquidity is the ratio that cash and equivalents in a specific year divided by the book value of total assets in that same period. Sales Growth Rate is defined as the annual sales growth rate. Capex is the ratio of capital expenditures to total sales. Leverage is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability.

t-test for mean of two subsamples.

variables	Focused	Diversified	t-statistics
$Q_{[t+1,t+3]}$	3.0338	1.962	3.74***
$HI_{[t+1,t+3]}$	1	2.3944	−33.26***
ln $Assets_{[t+1,t+3]}$	4.6161	5.0567	−6.32***
$Liquidity_{[t+1,t+3]}$	0.3247	0.2014	11.06***
Sales $Growth\ Rate_{[t+1,t+3]}$	0.2548	0.1702	2.14**
$Capex_{[t+1,t+3]}$	0.1088	0.0592	2.76***
$ROA_{[t+1,t+3]}$	-1.1783	2.4007	−3.93***
$Leverage_{[t+1,t+3]}$	0.3425	0.4231	−6.98***
N	732	870	-

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

3.3 Correlation Matrix

Table 6 presents the Pearson correlations among dependent variable: Q; independent variables: the proxies of diversification (i.e., number of segment, HI, and Dummy), and other control variables. The correlation between Q and the proxies of diversification (i.e., number of segment, HI, and Dummy) are significantly negative at least at 5% level, which is consistent with Larry H.P. Lang and René M. Stulz (1994) who argued that Q is strongly negatively correlated with the degree of firm diversification. On the other hand, the degree of diversification increases with the number of segments and therefore the correlation is negative for that measure of diversification. The positive correlation between Liquidity or Sales Growth Rate or Capex and Q reveals that cash-rich firms and those with higher growth rates or higher degree of investment level have significantly higher market valuation due to safety concern and future prospect. This result is consistent with that of Fernandes and Ferreira (2007). Furthermore, the correlation between Leverage and Q is significant at 5% level. The correlation coefficients between independent variables and control variables are less than 0.2, and VIFs are all less than 10, proving the absence of any collinear problem.

Table 6 Correlation matrix

Variables for our sample of firms are from 2002-2004 Compustat sample of Nasdaq Exchange firms. Q stands for Tobin's Q and its numerator is computed as book value of total assets and the market value of equity; the denominator is total assets. # of Segment is the number of segment in a company collected from WRDS. HI (herein,"1/HI") is the Herfindahl Index which is computed based on revenues generated from different segments in a firm. ln assets is the logarithm value of total assets. Liquidity is the ratio that cash and equivalents in a specific year divided by the book value of total assets in that same period. Sales Growth Rate is defined as the annual sales growth rate. Capex is the ratio of capital expenditures to total sales. Leverage is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability.

	1	2	3	4	5	6	7	8	9	10
1.# of Segment	1									
2.HI	0.8656***	1								
3.Dummy	0.7392***	0.6393***	1							
4.ln Asset	0.1872***	0.1331***	0.1560***	1						
5.Liquidity	-0.2264***	-0.1689***	-0.2665***	-0.1958***	1					
6.Sales Growth Rate	-0.0439*	-0.0520**	-0.0534**	0.0063	0.0985***	1				
7.Capex	-0.0548**	-0.0537**	-0.0688***	0.0338	0.1126***	0.1311***	1			
8.ROA	0.0661***	0.0477*	0.0979***	0.2797***	-0.2157***	-0.0375	-0.1541***	1		
9.Leverage	0.1516***	0.1331***	0.1720***	0.1925***	-0.4012***	-0.0594**	-0.0255	-0.0953***	1	
10.Q	-0.0752***	-0.0571**	-0.0930***	-0.0222	0.1499***	0.0759***	0.0457*	0.0221	-0.0577**	1

***, **, * statistically significant at the 1%, 5%, and 10% levels, respectively

3.4 Cross-sectional Regression Analysis

Table 7 displays the cross-sectional regression results, where the dependent variable is Q. Model 1, Model 2, and Model 3 seperately presents three different measurements of diversification and their signs. Model 1 uses the number of segments in a company as the proxy of diversification. The coefficient is negative but not statistically significant. Model 2 uses the Herfindahl Index. The coefficient for this

variable is negative and significant at the 10% level, implying that average Q increases as the degree of diversification increases. Model 3 includes the dummy variable. The dummy variable is equal to 1 if the firm has more than one segment, and is 0 otherwise. The coefficient for this dummy variable is negative and significant at the 5% level. This evidence is in support of the information asymmetry hypothesis and the agency cost hypothesis.

In summary, the empirical results show negative asscociation between Q and diversificaiton. As a result, all three different measurements of diversification are in support of the diversification discount. Similarly, our evidence is supportive of the view that diversification is not a successful path to higher performance. This result is consistent with Lang and Stulz (1994).

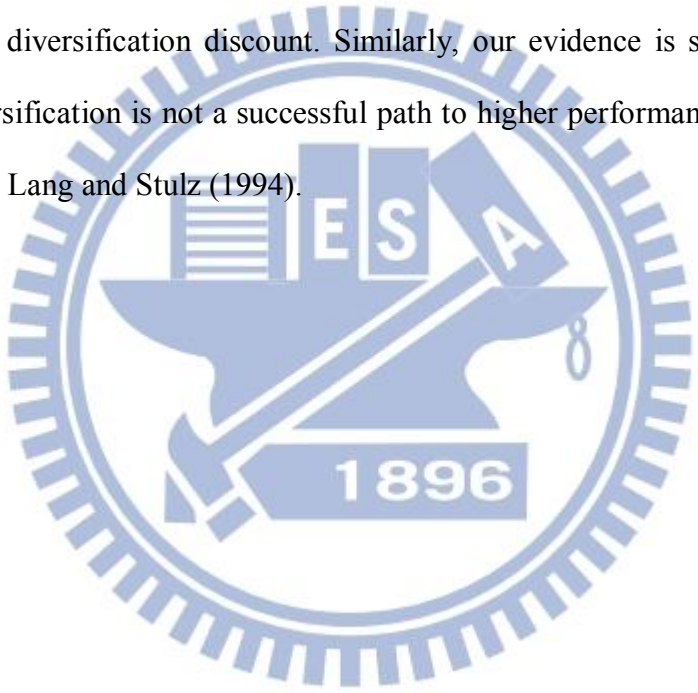


Table 7 Cross-sectional Regressions of Q and three measurements of diversification and controls

Variables for our sample of firms are from 2002-2004([t+1, t+3]) Compustat sample of Nasdaq Exchange firms. Q stands for Tobin's Q and its numerator is computed as book value of total assets and the market value of equity; the denominator is total assets. # of Segment is the number of segment in a company collected from WRDS. HI (herein,"1/HI") is the Herfindahl Index which is computed based on revenues generated from different segments in a firm. ln assets is the logarithm value of total assets. Liquidity is the ratio that cash and equivalents in a specific year divided by the book value of total assets in that same period. Sales Growth Rate is defined as the annual sales growth rate. Capex is the ratio of capital expenditures to total sales. Leverage is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability. The t-statistics are parentheses.

	Sign	**Model 1 (t-statistics)**	**Model 2 (t-statistics)**	**Model 3 (t-statistics)**
Intercept	+	1.423 (1.99)**	1.468 (2.01)**	1.519 (2.13)**
① DIV(# of Seg) $_{[t+1,t+3]}$	−	−0.105 (−1.48)		
② DIV(HI) $_{[t+1,t+3]}$	−		−0.175 (−1.68)*	
③ DIV(Dummy)	−			−0.689 (−2.06)**
ln Assets$_{[t+1,t+3]}$	−	−0.040 (−0.33)	−0.052 (−0.43)	−0.042 (−0.35)
Liquidity$_{[t+1,t+3]}$	+	4.084 (5.25)***	4.165 (5.38)***	3.963 (5.07)***
Sales Growth Rate$_{[t+1,t+3]}$	+	0.396 (2.18)**	0.395 (2.17)**	0.393 (2.16)**
Capex$_{[t+1,t+3]}$	+	0.425 (0.99)	0.429 (1.00)	0.415 (0.97)
ROA$_{[t+1,t+3]}$	+	0.029 (3.17)***	0.029 (3.18)***	0.029 (3.25)***
Leverage$_{[t+1,t+3]}$	+	0.856 (1.14)	0.857 (1.14)	0.907 (1.20)
Adjusted R^2		0.03	0.03	0.04
N		534	534	534

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

3.5 Regression s of Q and three measurements of diversification and controls.

Table 8 demonstrates the effect diversification on Q and other significant control variables. To examine the relation between diversification and Q, we revised the multivariate regression model as follows:

$$\mathbf{Q = f(Diversification, Liquidity, Sales\ Growth\ Rate, ROA)}$$

Table 8 displays the multivariate regression results. Model 1, Model 2, and Model 3 seperately presents three different measurements of diversification and their signs. Model 1 uses the number of segments in a company as the proxy of diversification. The coefficient is negative and statistically significant at 10% level. Model 2 uses the Herfindahl Index. The coefficient for this variable is negative and significant at the 10% level, implying that average Q increases as the degree of diversification increases. Model 3 includes the dummy variable. The dummy variable is equal to 1 if the firm has more than one segment, and is 0 otherwise. The coefficient for this dummy variable is negative and significant at the 5% level. Both results reveal that the degree of diversification increases as the market valuation decreases.

Table 8 Regression s of Q and three measurements of diversification and controls

Variables for our sample of firms are from 2002-2004([t+1,t+3]) Compustat sample of Nasdaq Exchange firms.Q stands for Tobin's Q and its numerator is computed as book value of total assets and the market value of equity; the denominator is total assets. # of Segment is the number of segment in a company collected from WRDS. HI (herein,"1/HI") is the Herfindahl Index which is computed based on revenues generated from different segments in a firm. Liquidity is the ratio that cash and equivalents in a specific year divided by the book value of total assets in that same period. Sales Growth Rate is defined as the annual sales growth rate. ROA means return on total assets and is the proxy of profitability. The t-statistics are parentheses.

	Model 1 **(t-statistics)**	**Model 2** **(t-statistics)**	**Model 3** **(t-statistics)**
Intercept	1.695 (4.61)***	1.669 (4.22)***	1.807 (5.02)***
① # of Segment$_{[t+1,t+3]}$	−0.107 (−1.69)*		
② HI$_{[t+1,t+3]}$		−0.167 (−1.85)*	
③ Dummy			−0.679 (−2.07)**
Liquidity$_{[t+1,t+3]}$	3.688 (5.24)***	3.787 (5.43)***	3.546 (5.00)***
Sales Growth Rate$_{[t+1,t+3]}$	0.403 (2.23)**	0.402 (2.22)**	0.398 (2.21)**
ROA$_{[t+1,t+3]}$	0.021 (2.53)**	0.021 (2.53)**	0.022 (2.59)***
Adjusted R^2	0.026	0.026	0.028
N	534	534	534

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

3.6 Literature Review – Adjusted R^2

Table 9 provides more literature to show low coefficients of determination (R^2). The coefficient of determination R^2 is used in the context of statistical models whose main purpose is the prediction of future outcomes on the basis of other related information. It is the proportion of variability in a data set that is accounted for by the statistical model. As we can see, the literature related to Q and diversification has

much low R^2. Although we have low adjusted R^2 in our models, the results seem to be reasonable.

Table 9 Adjusted R^2

Adjusted R^2	Literature Review	Journal
0.001 0.016 0.024	Philip G. Berger, Eli Ofek (1995)	Journal of Financial Economics 37,39-65
0.01 0.03 0.05	Shawn Thomas(2002)	Journal of Financial Economics 64, 373–396
0.011 0.015 0.017	Pornsit Jiraporn, Young Sang Kim, Ike Mathur (2008)	International Review of Financial Analysis 17, 1087-1190

3.7 Q and change in the degree of diversification following the black event

We showed that Q falls as diversification increases. The approach we followed so far relates Q cross-sectionally to the degree of diversification. This raises the question of whether firms that diversify are low Q firms or whether they are high Q firms that become low Q firms through diversification. In other words, do poorly performing firms diversify and find out that doing so does not make them high performers or is it that high performers diversify and become poor performers?

We provide evidence from the firms that change the number of segments they report in our sample period to 2. We call these firms diversifying firms under the assumption that the reporting of segment numbers is unbiased. With this assumption, firms that increase the number of segments reported are firms that either has acquired a new, important line of business or firms that have expanded an existing line of business to the point where it is large enough to justify reporting.

Table 10 shows the t-test for mean of Q. Firms that choose to diversify have lower average Q's, but the results are not statistically significant at conventional levels

for the mean. Firms that increase their number of segments have significantly lower Q's than firms that keep their number of segment constant. Diversifying firms have lower Qs. One possible explanation for this tendency of diversifying firms to have lower Q's is that the firms that diversify have lower Q's because the market anticipates poorer performance to result from the diversification attempt.

Table 10 t-test for mean of Q

Variables for our sample of firms are from 2001-2002([t, t+1]).Data on firms that add segments (diversifying firms, i.e., $\Delta seg > 0$) and firms that reduce their number of reported segments (focusing firms, i.e., $\Delta seg < 0$). Data on firms that change their segment (i.e., $\Delta seg \neq 0$) and firms that do not change their segment (i.e., $\Delta seg = 0$). The t-statistics are parentheses.

	Tobin's Q	N	t-statistics (Pr>|t|)
$\Delta seg_{[t,t+1]} = 0$	1.87	344	1.26(0.20)
$\Delta seg_{[t,t+1]} \neq 0$	1.64	180	-
$\Delta seg_{[t,t+1]} > 0$	1.35	86	-1.38(0.16)
$\Delta seg_{[t,t+1]} < 0$	1.9	94	-
$\Delta seg_{[t,t+1]} = 0$	1.87	344	-0.17(0.86)
$\Delta seg_{[t,t+1]} < 0$	1.9	94	-
$\Delta seg_{[t,t+1]} = 0$	1.87	344	3.26(0.0012)***
$\Delta seg_{[t,t+1]} > 0$	1.35	86	-

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

4. Conclusion

To understand that growth strategy is considered to be of crucial importance to the long-term performance of a firm. This paper examines the differences in market value between focus and diversification strategy. As a result, we find that the outperformance made by focused firms experience greater long-run stock performance (BHARs) than diversified firms, but not significant.

Also, the highly diversified firms have significantly lower Q than focused firms. This evidence shows strongly that highly diversified firms are consistently valued less than focused firms. The cross-sectional regression analyses also document a significantly negative relation between the degree of corporate diversification and Tobin's Q, even after controlling for other determinants. Therefore, we conclude that there is a negative relationship between the degree of diversification and Q in our dataset, which is consistent with information asymmetry hypothesis.

We also provide evidence from the firms that change the number of segments they report in our sample period to 2. Firms that increase their number of segments have significantly lower Q's than firms that keep their number of segment constant. Diversifying firms have lower Qs, and it is consistent with our previous results. One possible explanation for this tendency of diversifying firms to have lower Q's is that the firms that diversify have lower Q's because the market anticipates poorer performance to result from the diversification attempt.

Our evidence is supportive of the view that diversification is not a successful path to higher market values, but it is less definitive on the question if the extent to which diversification hurts market values.

Our results also suggest that a more detailed analysis of the benefits and costs of diversification that tests explicit models of these benefits and costs would be used since our evidence is not consistent with the view that some firms do gain from diversification.

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Appendix

Table 11 Cross-sectional Regressions of Q and teck dummy and controls

Variables for our sample of firms are from 2002-2004([t+1,t+3]) Compustat sample of Nasdaq Exchange firms.Focused stands for company with only one segment; diversified for more than two segments. Q stands for Tobin's Q and its numerator is computed as book value of total assets and the market value of equity; the denominator is total assets. ln assets is the logarithm value of total assets. Liquidity is the ratio that cash and equivalents in a specific year divided by the book value of total assets in that same period. Sales Growth Rate is defined as the annual sales growth rate. Capex is the ratio of capital expenditures to total sales. Leverage is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability. teck dummy for high-teck firms , which equals one if firm' SIC code is categorized in high-tech industries 283, 357, 366, 367, 382, 384, and 737 with coverage in Compustat, otherwise equals to zero.(Brown, Fazzari, and Peterson, 2009).

	Sign	Model (t-statiatics)
Intercept	+	1.3384 *(1.76)
ln Assets$_{[t+1,t+3]}$	−	−0.0730 (−0.60)
Liquidity$_{[t+1,t+3]}$	+	4.3829***(5.35)
Growth of Sales$_{[t+1,t+3]}$	+	0.4000**(2.20)
Capex$_{[t+1,t+3]}$	+	0.4358(1.02)
ROA$_{[t+1,t+3]}$	+	0.0286(3.16)
Leverage$_{[t+1,t+3]}$	+	0.7580(0.99)
teck dummy	−	−0.1598(−0.42)
N		534
Adjusted R^2		0.0287

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

Table 11 displays the cross-sectional regression results, where the dependent variable is Q. Model includes the teck dummy variable. The teck dummy variable is equal to 1 if the firm' SIC code is categorized in high-tech industries 283, 357, 366, 367, 382, 384, and 737 with coverage in Compustat, and is 0 otherwise.(Brown, Fazzari, and Peterson, 2009). The coefficient for this dummy variable is negative but not significant. And the adjusted R^2 is still much low, which means that high- or low-teck firms are not the key factor for the performance.