Global Journal of Business Research
Vol. 11, No. 2, 2017, pp. 27-42
ISSN: 1931-0277 (print)
ISSN: 2157-0191 (online)

IBFR
www.theIBFR.com

AN EXPLANATION OF FINANCIAL MARKET ANOMALIES: RISK-BASED OR BEHAVIORAL VIEW? A NEW PERSPECTIVE ON FINANCIAL CONSTRAINTS

Chih-Wen Yang, National Yunlin University of Science and Technology
Chun-An Li, National Yunlin University of Science and Technology
Sam Ting-Hsin Hsu, National Yunlin University of Science and Technology

ABSTRACT

At present, there are two main explanations for market anomalies, namely, risk-based and behavioral. While the risk-based perspective states that abnormal returns arise owing to investors undertaking financial risks, the behavioral perspective states that abnormal returns arise owing to investor psychology. However, we believe that the source of abnormal returns originates from financing constraints. Viewed from a different perspective, financial constraints arise from information asymmetry, which in turn leads to an incorrect assessment of behavior. Moreover, the risk of financial distress also has a correlation with financial constraint. The link between the two provides another common explanation for market anomalies. This study utilizes publicly disclosed stock data of the Taiwan stock exchange in order to prove the above argument. Furthermore, apart from the commonly observed explanations of under- and overreaction, cash dividends can also logically explain the extent of under- and overreaction, which plays a critical role in determining the expected returns of an asset portfolio.

JEL: G12, G14, G31

KEYWORDS: Underreaction, Overreaction, Three-Factor Model, Financial Constraint

INTRODUCTION

The capital asset pricing model by Sharpe (1964), Lintner (1965), and Mossin (1966), which has taken the financial world by storm, has generated much debate. Most empirical studies believe that the market risk factors of the capital asset pricing model (CAPM) cannot fully explain market anomalies such as the momentum effect proposed by Jegadeesh and Titman (1993), the reversal effect postulated by DeBondt and Thaler (1985), and the size effect postulated by Banz (1981) and Basu (1983). In order to resolve the inadequacy of the CAPM and after having realized that market risk factors alone cannot explain abnormal returns of an asset portfolio, Fama and French (1993) introduced the renowned three-factor model. Extending the basic perspective of the CAPM, the three-factor model proposes that apart from market risk factors, size and book-to-market factors are also important in explaining excess returns. Similar to the CAPM, the three-factor model of Fama and French (1993) also generated much interest and debate in the academic world. The debate centers on two main points. First to determine whether or not the three-factor model is capable of successfully capturing all market anomalies. Fama and French (1996) believe that with the exception of the momentum effect, the three-factor model is capable of capturing the market anomalies omitted by CAPM. Fama and French (2015) further enhance the three-factor model by including profit and investment factors. With the exception of not being able to capture high investments and low profits of the low average return of small shares, this five-factor model can adequately explain excess returns of an asset portfolio. Another argument states that the factor models can be explained in terms of either risk or behavior. For both the three-factor and five-factor models, Fama and French advocate that explanatory factors arise from the premium for taking risk. However, opposing researchers believe that market anomalies occur as a result of investor behavior; Shefrin and Statman's (1997) empirical evidence supports this point of view and backs the explanation of multiple-factor models that market anomalies arise from the cognitive bias of the investor. This study

does not discuss either the three-factor or the five-factor model, but instead attempts to explain whether the factors are a result of risk or behavior, from a financing constraint perspective.

With regard to both the risk and behavioral perspectives, the difference in views centers on the causes of the book-to-market effect (overreaction) and the momentum effect (underreaction). From the risk perspective, the core of the factor model being size, book-to-market ratio and stock return share common risk factors, which can also be explained by risk compensation of financial distress. The behavioral perspective believes that incorrect pricing originates from the psychological bias of the investor; one example is that of an investor's incorrect perception of company profit leading to under- or overreaction in stock prices. Company profit is a controversial topic from the risk and behavioral perspective, and is at the same time is related to financial distress and financial constraints.

Financial constraint is a precondition to financial distress. The risk of financial distress also has a correlation with financial constraint. Financial constraint is caused by information asymmetry; the more severe the latter is, the more difficult it is for external investors to assess the value of the company, which would most likely lead to company stock misprice. Therefore, we believe that the financial constraint perspective can provide a more logical explanation in the debate on the risk and behavioral perspective. This study consults proxy variables commonly adopted by prior literature and utilizes the following: cash dividends brought forward by Fazzari, Hubbardand, and Petersen (1988) as well as Almeida and Campello (2007); debt-to-total capital ratio proposed by Hovakimian and Titman (2006); cash flow-to-total capital ratio proposed by Kaplan and Zingales (1997); and finally, the Kaplan-Zingales Index (KZ-Index) put forth by Lamont, Polk, and Saaá-Requejo (2001). These variables are adopted for measuring financial constraints and for subsequent grouping analysis.

The term "attention" is described by behavioral finance as follows: with no change in the internal and external environment, and owing to a change in investor psychology, there arises a variation in investment behavior leading to a subsequent abnormal fluctuation in asset price and trade volume. Based on their research on anchoring and limited attention, Li and Yu (2012) prove that a 52-week high in stock prices can proxy for an investor's underreaction to news events. A stock price approaching historical highs can be utilized to proxy for investor overreaction to news events. This research uses the shares publicly traded on the Taiwan stock exchange as the main subject of study, and uses the reasoning of Li and Yu (2012) to discuss the under- and overreaction position of groupings under stock size, value and growth stocks, and financing constraint as proxies. If underreaction is apparent in small stocks, but not in large stocks, we can be certain that such a phenomenon has already been captured by the size effect; or if overreaction exists in value stocks, but not in growth stocks, then overreaction can be represented by a book-to-market ratio effect. By employing such a method, we can confidently assess whether or not other characteristics would exert an effect on the expected returns of an asset portfolio in the momentum and reversal effect groups. Through the presentation of under- and overreaction, we will continue with the three-factor model analysis on pre-group and post-group scenarios.

First, we initiate grouping on the basis of whether there has been cash dividend issuance to clarify the under- and overreaction phenomenon. The analysis reveals that such grouping not only makes the under- and overreaction phenomena more apparent, but also increases the explanatory ability of the model. This result indicates that whether or not there is an issuance of cash dividends, we can exclude book-to-market ratio and size effect anomalies. Chan, Chang, and Hsu (2016) state that the issuance of cash dividends can effectively show the extent of financing constraints, thereby implying that financing constraints could likely be the interfering factor in book-to-market ratio and size effect. Owing to this, we continue with the analysis of various groups to determine whether or not the intercept of the three-factor regression is significant and not zero. The result shows that even though various variables have significant explanatory capabilities before being grouped, the intercepts are significant and not zero, indicating that there are other factors that are not being captured by the model. Further, post grouping by cash dividend issuance indicates that factors being significant and intercept no longer carries any meaning. This fit is in line with our expectations that the three-factor model completely explains the change in returns. Furthermore,

in the grouping by cash flow-to-total capital ratio, debt-to-total capital ratio, and KZ-Index, the robustness analyses show that in the three-factor model, firms with financing constraints perform better than those without. This study makes three major contributions to the financial domain. First, we group shares by their size, value, growth, and financing constraint proxies forming the relevant asset portfolio indices to measure the under- and overreaction of investors. We also clarify the debate between multiple factor models of the risk and behavioral perspectives. The result clarifies whether financing constraint is key to explaining market anomalies. Second, the results indicate the three-factor model has a complete explanatory capability for firms that have no dividend issuance, suggesting that in the Taiwan stock market, the issuance of dividends is an important factor in effecting the expected return of shares. Finally, this study finds an association between financial distress and firms' difficulty in obtain financing. The source of financing constraints arises from information asymmetry, which would also cause incorrect assessment. The financing constraint perspective provides another common explanation in the debate on whether a market anomaly arises from risk or behavior. This study is organized as follows: section 1 provides an introduction, section 2 provides a literature review on market under- and overreaction as well as the three-factor pricing model, section 3 introduces the limited attention and anchoring psychology of the investor, section 4 explains the results of the empirical analysis, and section 5 concludes the paper.

LITERATURE REVIEW

Fama and French (1993) believe that apart from market factors effecting excess returns of the asset portfolio, the risk factor can also be explained in terms of SMB and HML, proving it to be the essence of multiple affecting factors. Fama and French (1996) further prove the abnormality of the return momentum of the three-factor model by Fama and French (1993). Regrettably, the model cannot completely address the existence of short-term return momentum, and at the same time, gives rise to considerable doubts about attributing size and book-to-market factors as risk factors. Lakonishok, Shleifer, and Vishny (1994) believe that a high book-to-market ratio is a result of investors' ability to determine mispriced stocks. Kothari, Shanken, and Sloan (1995) perceive that a high book-to-market ratio occurs as a result of not incorporating data of those firms under distress and that have collapsed, causing a distortion in the weighting of those firms in distress, which is the result of survivorship bias. Daniel and Titman (1997) observe that stock returns should be determined by the characteristics of such stock. High book-to-market ratios originate from stocks' own similar characteristics, which is the preference of the investor, and not a result of risk.However, explaining under- and overreaction from the risk-return perspective is not convincing enough for those that consider various perspectives on the issue.

Daniel, Hirshleifer, and Subrahmanyam (1998) believe that publicly disclosed information causes the overreaction of private information. Continuous overreaction leads to price momentum, thereby regressing the price to its fundamentals; price reversal is the result of investor overconfidence and self-attributing bias. Barberis, Shleifer, and Vishny (1998), on the other hand, believe that investors' information processing is too slow, which causes short-term underreaction; they believe that history repeats itself, hence leading to subsequent overreaction, and that in the long run the stock price reverses to correct itself. Through the explanation of effects among various type of investors, Hong and Stein (1999) believe that the private information of the observer spreads to other observers. The under- and overreaction of those stocks with slow information spread outpaces those with relatively faster information spread. Regardless of whether it from a rationalist or behaviorist perspective, the primary difference centers on the causes of the book-to-market effect and momentum effect. Li and Yu (2012) utilize anchoring and limited attention as proxies for overreaction and underreaction, respectively, and prove that these two are not affected by macroeconomic variables. We will use this method to analyze the components of the three-factor model, namely, size and the book-to-market ratio, and to discuss the variation in momentum and the reversal effect. Finally, through three-factor cross-section regression analysis, we will confirm whether our hypothesis provides the extended explanatory capability for asset portfolio returns. The essence of the three-factor model is the explanation of the common risk factors pertaining to size, book-to-market ratio, and stock return, which can also be determined by firm earnings.

Firm earnings not only reflect on stock returns, but also imply operating risks, corresponding returns, and risks. At the same time, abnormalities in stock returns have the most correlation with size and book-to-market factors, further stressing the importance of firm earnings. Fama and French (1993) accept the relative distress perspective of Chan and Chen (1991) to explain the anomalies in stock returns and believe that the performance of expected earnings affects an investor's perception of a firm's future prospects. Firms with negatively perceived future prospects are reflected with low stock prices by the market, leading to reduced market value, and a higher book-to-market ratio, implying that the firm is facing financial distress. In contrast, a low book-to-market ratio suggests that the firm has sound future prospects, and hence value premium represents a certain type of risk compensation for relative distress.

Lakonishok, Shleifer, and Vishny (1994) believe that value premium is the result of mispricing by the market. This issue originates from investors' irrational overreaction to a firm's profit information which, in turn, leads to a high book-to-market ratio. This results in the underestimation of the stock price and, conversely, the overestimation of stock price with a low book-to-market ratio. When markets restore rationality, stock prices return to their fundamentals, making those with high book-to-market ratios exhibit higher average returns and vice versa for those with low book-to-market ratios, thereby leading to the subsequent formation of value premium. Despite the differing opinions of the relative dilemma hypothesis by the rational school of thought and the misprice hypothesis of the behaviorist school, both actually utilize common agenda for their discussion of the topic, thus proving the importance of firm profit. Apart from describing the cause of value premium, another important implication of the misprice hypothesis is highlighting the effect of firm profit on investor behavior, and pointing out that the overreaction phenomenon is the reason for the incorrect estimation of risk factors. Coincidentally, Barberis, Shleifer, and Vishny (1998) also supplement the underreaction phenomenon through the investor behavior perspective. Believing that firm profit is a form of a random walk, they explain the expectation mentality of the investor through continuous variation in signs and then further explore the under- and overreaction phenomena. When variation in firm profit with the same sign continues to hold, it leads to the investor's belief that firm profit would continue to increase or decrease subsequently, causing incorrect judgment of the trend, and hence the overreaction to the stock prices. Profit with opposing sign variation leads the investor to believe that profit reversal is of a short-term nature, thereby causing underreaction. Therefore, when explaining the financial theory from a behavioral perspective, firm profit still plays an important role and is worth deep exploration.

The relative distress hypothesis derives its formation from the explanation of value premium from the rational market perspective. However, the more important implication of the hypothesis lies in the basis of size premium. The theory postulates that operating difficulty varies with firm size; operating difficulty ranks higher for small firms relative to large ones and the former face larger risks, and hence, provide higher stock returns owing to risk compensation. This point of view leads back to the fundamentals of the firm and to the question – what is the ultimate cause of financial distress? Is it owing to inadequate profits, an excessive level of debt, or a lack of cash flow? If the firm holds an abundant amount of cash or possesses unimpeded channels for financing, would it still face financial distress?

Financing constraint is a precondition to financial distress. Even though financing constraint does not necessarily equate to financial distress, from the risk perspective, we suspect that the risk of financial distress could be related to a firm's inability to obtain capital owing to a financing constraint. From the behavior perspective, a financing constraint is a result of asymmetric information. The more severe the asymmetry, the more difficult it is for a firm to obtain external capital, which, in turn, would make it more difficult for external investors to assess the value of a firm, thereby resulting in the mispricing of the firm's stock. Therefore, we assume that, from the financing constraint perspective, this should be able to provide an adequate common explanation for the debate on market anomalies from the risk and behavioral perspectives. Firms faced with financing constraints are commonly affected by factors such as agent cost according to Jensen and Meckling (1976), information asymmetry according to Myers and Majluf (1984), and free cash flow according to Jensen (1986). Such constraints lead to higher costs of external capital, resulting in difficulty in obtaining external financing. Commonly utilized measuring

indicators for financing constraints include the rate of dividend issuance, the concentration of ownership, the KZ-Index, among others. According to Section 241 of the Taiwan Companies Act, cash dividends can only be issued on the condition that a firm is not making a loss. Therefore, we utilize cash dividend as the proxy for firm profit in order to examine the hypothesis. At the same time, cash dividend is also set as the standard for measuring a firm's financial constraint, following the method suggested by Almeida and Campello (2007) and Fazzari, Hubbardand, and Petersen (1988). Generally, firms that issue higher cash dividends or higher amounts of cash relative to the total capital correspond to holding an abundant amount of cash and are less likely to be financially constrained. Chan, Chang, and Hsu (2016) discover that dividend issuance can effectively show the extent of financing constraint. Furthermore, firms with a higher debt-to-equity ratio face a higher challenge of obtaining funding, suggesting a higher possibility of financing constraint. Therefore, we initiate grouping based on whether or not cash dividends are issued to clarify the under- and overreaction phenomenon. This is followed by debt-to-total capital ratio suggested by Hovakimian and Titman (2006), cash flow-to-total capital ratio suggested by Kaplan and Zingales (1997), and KZ-index put forth by Lamont, Polk, and Saaá-Requejo (2001). The three proxies of financing constraint are utilized for the robustness test.

DATA AND METHODOLOGY

This study utilizes data from the databases of Taiwan Economic Journals (TEJ). The sample incorporates publicly traded ordinary shares in the Taiwan Stock Exchange. The data include financial shares and full-cash delivery stocks, but excludes stocks that have been delisted. Considering that under- and overreaction phenomena can end in a short timeframe, this study adopts weekly data for empirical analysis. Through an increase in data intensity, it is possible to capture these particular events, mirroring the actual nature of the market and avoiding the possibility of low data frequency affecting the results. On the basis of limited attention and anchoring psychology, Li and Yu (2012) find the two important variables to proxy for under- and overreaction of investors. They use the Dow Jones industrial index's proximity to the 52-week high to proxy for underreaction, and the equation is represented as follows:

$$X_{52,t} = \frac{p_t}{p_{52,t}} \tag{1}$$

The investor overreaction is proxied by the Dow Jones industrial index approaching a historic high, and is represented as follows:

$$X_{max,t} = \frac{p_t}{p_{max,t}} \tag{2}$$

The first variable has positive relations with the future stock return, whereas the second has negative relations. Li and Yu (2012) also prove that the explanatory capability of these two proxy variables is not susceptible to the effects of macroeconomic variables. This finding is contrary to the conventional methodology of analysis by grouping through factor dimensions. This method can more intuitively compare the extent of variations in investor under- and overreactions. In addition, the debate on market anomalies can be examined and through the apparent differences, we can conduct the reversal analysis of various assumed factors, thus identifying the source of the causes.

Li and Yu (2012) utilize data of stock traded in the US market to conduct monthly overlapping regression. Yang, Li, and Hsu (2016) adopt this method, proving that the model can be adapted to the Taiwan stock market. This study uses the Taiwan Weighted Index (TWII) to proxy the Dow Jones industrial index The five explanatory variables in the model incorporate the actual returns of the TWII deducted by the $R_{pass,t}$, derived from the risk-free rate to represent the past excess returns (including 1, 3, 6, and 12 months). From this, the risk-free rate is derived from the one-year fixed-term deposit rate of the First Bank of Taiwan. $X_{52,t}$ represents the extent to which the TWII approaches its 52-week high, which

proxies for investor underreaction; $X_{max,t}$represents the extent to which the TWII approaches its 52-week high, which proxies for investor overreaction; D_t is our dummy variable that takes on the value of 1, which represents the TWII reaching its historical high, and 0 otherwise; I_t is another dummy variable, which represents the TWII reaching a new high, implying underreaction of the investor. I_t takes on the value of 1 when the 52-week high of the TWII is equal to its historically high value, and 0 otherwise. The regression to examine under- and overreaction is represented as follows:

$$R_{future,t} = \alpha_0 + \beta_1 R_{pass,t} + \beta_2 X_{52,t} + \beta_3 X_{max,t} + \beta_4 D_t + \beta_5 I_t + \varepsilon_t \quad (3)$$

The dependent variable, which represents future excess returns (for 1, 3, 6, and 12 months) corresponds with $R_{pass,t}$. Daniel and Titman (1997) propose another model that proves that the determination of stock return is a result of the stock's own characteristic, and it is not determined by Fama and French's (1993) risk model. The characteristic model assumes that the cross-section expected returns can be determined by the stock's own characteristic, and is not caused by the loading of the common risk factors. Even though Rouwenhorst (1998) discovered that the stock price determining factors of emerging markets are quite similar to that of industrialized ones, the question of what is the deciding factor in the Taiwan stock market cross-section returns is yet to be resolved. Regardless of which model is suitable for the Taiwan stock market, we endeavor to seek the possibility of a common factor between the two models.

According to Section 170 of the Taiwan Companies Act, the annual general meeting of shareholders should be held within six months of the end of financial year, and financial reports should be recognized during such a meeting. Therefore, most of the financial reports are published before the end of June every year. Based on this, we follow Fama and French's (1993) study, which adopts the annual change in weight method on the first transaction day of every June, conducts grouping according to firm size and the BM ratio of the previous month, and defines the size premium SMB and the value premium HML. There are numerous small stocks in the Taiwan stock market that are substantially different from large stocks. The market value of the top 20 firms is around 50% of the entire share market. Given this inherent problem, the value-weight method is not able to capture the effects of small stocks. In order to avoid distortion in our results, this study adopts the equal-weight method for weight calculations. Here, RMF = Rm - Rf represents market risk premium, Rm is the rate of return for the TWII; Rf is the risk-free rate, derived from the one-year fixed-term deposit rate of the First Banks of Taiwan; RPF = Rp - Rf represents the abnormal return of the asset portfolio, of which Rp is the weighted return of the six combined groups SL, SM, SH, BL, BM, and BH. The intercept (Jensen's alpha) is the indicator of the measure for abnormal return if α is significant and not zero, suggesting that the asset portfolio contains abnormal returns that cannot be explained by the three-factor model. The accumulated abnormal return calculation for a holding period of 1, 3, 6 and 12 months is derived by DeBondt and Thaler's (1985) method. From the above description, the thee-factor model is, therefore, described as follows:

$$RPF_t = \alpha + \beta_1 RMF_t + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_t \quad (4)$$

After consulting the composition guidelines of the Taiwan Weighted Index (TWII), we formulate another grouping method, whereby the stock price-weighted index of the group is as follows:

$$INDEX = \sum_{t=1}^{n} \frac{P_t Q_t}{BV} \times 100 \quad (5)$$

INDEX is derived from the total market value of the firm stock (P_tQt) divided by the base value (BV), multiplied by 100. The base value is the total stock value on the first transaction day of the sample period; the base value is adjusted on the first transaction day of every June, and displays a new value. The adjustment is done by multiplying the old base value by the ratio between the old and new total market value of the stock. In terms of financing constraint, Chan and Wang (2005) adopt the categorization

standard of Maestro, De Miguel, and Pindado (2001) and consult that of Lamont, Polk, and Saaá-Requejo (2001) to formulate the KZ-Index method. This is formulated so that a suitable method can be adopted for the financing constraint of the Taiwan stock market and is expressed as follows:

$$FC = -1.17 \times \frac{Cash\ Flow}{K} - 1.75 \times Q + 0.71 \times \frac{Debt}{Total\ Capital} - 38.83 \times \frac{Dividends}{K} - 1.51 \times \frac{Cash}{K} \quad (6)$$

In this expression, K represents the cost of fixed asset in the current period; *Cash Flow* is derived from profit after tax in the current period – extraordinary items + depreciation; the formula for Tobin's Q is defined as (market value of firm equity + book value of debt) / book value of total asset; *Debt* is the total debt of the firm; *Total Capital* is the total capital held by the firm; *Dividends* represent the total cash dividends issued by the firm; *Cash* represent the cash and cash equivalents held by the firm.

EMPIRICAL RESULTS

This study conducts empirical analysis on publicly traded firms listed on the Taiwan stock exchange for the period 1995–2015. The study is categorized into two parts. The first section of the research conducts a comparison on the price reaction difference between value stocks and growth stocks via a book-to-market grouping; this comparison also extends to grouping by firm size. Next, we further explore the explanation on differences due to whether there has been cash dividend issuance. The second section makes a comparison on value stocks and growth stocks as well as large stocks and small stocks from the risk perspective. By employing Fama and French's (1993) three-factor method, variations in abnormal returns can be explained and the effect of the issuance of cash dividends determined. Our comparison further extends to the abnormal return of value stocks versus growth stocks and large stocks versus small stocks impacted by financing constraints. By employing a two-part empirical test, we can provide an adequate explanation of the financing constraint. Table 1 lists the descriptive statistics of the relative variables. *SIZE* is the market value of equity that represents firm size. There is a very significant difference between the extreme values. Its median is 5,179, which is significantly lower than the average of 24,108, suggesting a significant difference between large and small stocks. This is representative of Taiwan's stock market, which has a significantly large number of small stocks. *BM* represents the book-to-market ratio and has a median value of 0.72, indicating that growth stocks account for much of the share in Taiwan's stock market. *CR* is the cash dividend ratio and has a median value of 1.32, indicating that most firms do in fact issue cash dividends. *KZ*, *DC*, and *CC* represent the KZ-Index (-0.25), debt-to-total capital ratio (79.79) and cash flow-to-total capital ratio (11.06), respectively.

Table 1: Descriptive Statistics

Variables	Mean	Median	Max.	Min.	S.D.
SIZE	24,018	5,179	3,630,253	45	97,794
BM	0.84	0.72	9.09	0.02	0.56
CR	2.26	1.32	32.35	0.00	2.67
KZ	-6.08	-0.25	52.12	-239.98	20.24
DC	143.50	79.79	3,903.48	1.15	285.54
CC	11.37	11.06	674.14	-365.01	27.72

This table presents the mean, median, maximum value, minimum value, and standard deviation for the variables of the groups. SIZE is the size of the firms by market value and the units are in millions of New Taiwan dollars. BM represents the book-to-market ratio; CR represents the cash dividend ratio; KZ represents the KZ-Index; DC represents the debt-to-total capital ratio; CC represents the cash flow-to-total capital ratio. The sample period 1995–2015 covers publicly traded companies listed on the Taiwan stock exchange.

Book-to-Market Ratio Group

Table 2 presents the monthly overlapping regression results under the book-to-market grouping. Analysis of the full sample analysis of value stock in Panel A shows an expanding trend through time for X_{52} and X_{max}, the proxies for underreaction and overreaction, respectively. There is also a significant forecasting capability for future excess returns. In the analysis of growth stocks, on the other hand, all the holding periods display significant relations with future excess returns, except for the holding period of six

months for X_{52} and three months for X_{max}. This result indicates that under- and overreaction phenomena generally exist in the Taiwan stock market. One factor worth noting is that in the case of growth stocks the variable X_{52} changes signs, not as expected, from positive to negative for the 6- and 12-month groups. Similarly, the X_{max} variable also undergoes a change in sign, but from negative to positive. We have discussed in the literature review with regards to the assumption that the abnormal phenomena could be owing to firm profit. Therefore, we utilize cash dividend as the proxy for firm profit, group the book-to-market ratio samples, and then further them into subgroups during dividend issuance.

Panels B and C of Table 2 further divide the samples into subgroups for repeat period regression analysis and display the results. Panel B of Table 2 indicates that firms that do not issue cash dividends consistently show under- and overreaction phenomena for both growth and value stocks, which increases in extent with time. The fit of the model also increases, and there is no abnormality with the signs. On the other hand, Panel C of Table 2 shows that firms with dividend issuance, apart from certain minor differences, generally exhibit similar results as that of Panel B.

Table 2: Monthly Overlapping Regression – Book-to-Market Ratio

	Panel A: Full Sample			**Panel B: Without Cash Dividend Issuance**			**Panel C: With Cash Dividend Issuance**		
	X_{52}	X_{max}	R^2	X_{52}	X_{max}	R^2	X_{52}	X_{max}	R^2
Value									
1-Month	0.11***	-0.11***	0.04	0.12***	-0.14***	0.04	0.13***	-0.14***	0.04
	(3.44)	(-3.16)		(4.52)	(-4.24)		(3.93)	(-3.66)	
3-Month	0.35***	-0.35***	0.09	0.40***	-0.46***	0.08	0.38***	-0.39***	0.08
	(6.26)	(-5.51)		(8.08)	(-7.34)		(6.65)	(-6.01)	
6-Month	0.63***	-0.60***	0.21	0.63***	-0.67***	0.16	0.63***	-0.61***	0.18
	(9.49)	(-7.93)		(9.34)	(-7.89)		(9.69)	(-8.26)	
12-Month	1.15***	-1.14***	0.31	0.96***	-1.02***	0.23	1.1***	-1.08***	0.29
	(15.30)	(-12.93)		(12.52)	(-9.89)		(15.90)	(-13.21)	
Growth									
1-Month	0.05***	-0.05**	0.02	0.07***	-0.08***	0.02	0.06***	-0.07***	0.03
	(2.69)	(-2.18)		(3.23)	(-2.67)		(4.16)	(-3.93)	
3-Month	0.07*	-0.04	0.05	0.19***	-0.19***	0.03	0.16***	-0.19***	0.06
	(1.65)	(-0.73)		(4.67)	(-3.56)		(5.76)	(-5.30)	
6-Month	-0.08	0.21***	0.18	0.21***	-0.13*	0.06	0.26***	-0.28***	0.14
	(-1.5)	(3.28)		(3.53)	(-1.67)		(7.54)	(-6.22)	
12-Month	-0.09*	0.32***	0.34	0.44***	-0.31***	0.16	0.31***	-0.31***	0.30
	(-1.65)	(4.67)		(5.53)	(-2.84)		(8.55)	(-6.27)	

This table presents the results for the monthly overlapping regression, with the regression shown below: $R_{future,t} = \alpha_0 + \beta_1 R_{pass,t} + \beta_2 X_{52,t} + \beta_3 X_{max,t} + \beta_4 D_t + \beta_5 I_t + \varepsilon_t R_{future,t}$ *represents the future excess returns (1, 3, 6, and 12 months);* $R_{pass,t}$ *represents the past excess returns (1, 3, 6, and 12 months) and the corresponding future excess returns;* $X_{52,t}$ *represents the extent of the Taiwan Weighted Index approaching its 52-week high;* $X_{max,t}$ *represents the extent of the Taiwan Weighted Index approaching its historic high;* D_t *represent the Taiwan Weighted Index at its historic high;* I_t *represents the Taiwan Weighted Index setting the new high. The risk-free rate is the one-year fixed-term deposit rate of the First Bank of Taiwan. The sample period covers the period 1995–2015. Repeated sampling is conducted on a monthly basis. The Newey-West method is adopted to control heterogeneity and autocorrelation. The values in the brackets are t-values. The asterisks, *, **, and *** represent 10%, 5%, and 1% levels of significance, respectively.*

In general, under the book-to-market grouping, when the comparison is made on dividend issuance, both value and growth stocks display significant under- and overreaction More significantly, the model experiences an increase in its explanatory capability. This result indicates that value stocks are not affected by the issuance of the cash dividend. More importantly, we find that the possible interfering factor for book-to-market ratio should be the proxy for firm profit and financing constraint. The question posed at this juncture is whether cash dividends have been issued.

Grouping by Firm Size

Table 3 presents the monthly overlapping regression result or grouping under firm size. In the full sample of small stocks of Panel A, we find that the proxies for underreaction X_{52} and overreaction X_{max} expand with time and show consistent forecasting capability for future excess returns. As such, there is indication that in the Taiwan stock market small stocks display significant under- and overreaction phenomena. On the other hand, for large stocks, the variable X_{52} only displays significant underreaction phenomena for the holding periods of 1 and 12 months. Whereas X_{max} is consistently insignificant, it indicates that overreaction does not exist in large stocks. In addition, for both large and small stocks, the explanatory capability of the model increases with time. Panels B and C of Table 3 present the results for the regression of firm size grouping and subsequently those of further subgrouping in the event of cash dividend issuance. Panel B of Table 3 shows that firms that do not issue cash dividends under the small stock group have significant under- and overreaction phenomena. Under the large stock group, apart from the six-month holding period, there is a significant effect on future excess returns.

On the other hand, Panel C of Table 3 shows that all the firms of the group that issues cash dividends, apart from the underreaction of small stock with a one-month holding period, display significant under- and overreaction phenomena. Generally speaking, under firm size grouping, subsequent to comparisons being made on whether cash dividends have been issued, we find explanatory capability for future excess returns. Small stocks without cash dividend issuance experience a significant increase. However, small stocks that issue cash dividends actually experience a decrease in explanatory capability. This suggests that the under- and overreaction phenomenon of small stocks originate from those firms that do not issue cash dividends. On the other hand, the explanatory capability significantly increases with large stocks, for those that both issue and do not issue cash dividends. This is especially the case for those that do issue cash dividends and is also true for long-term holdings. Moreover, we also find that in large stocks of Panel A, the six-month holding period was originally not significant for variables X_{52} and X_{max}. However, with further subgrouping, we find that those that issue cash dividends become significant, and the signs for those firms that do not issue cash dividends revert to normal. The empirical results show that the presence of cash dividend issuance for the explanation of the size effect has a similar result as the book-to-market ratio effect.

In previous sections, we explained the importance of firm profit through both the rational and irrational perspectives in order to discuss the formation of the value premium. Section 241 of the Taiwan Companies Act, which lists the rules for profit and distribution, states that cash dividends should be issued only when the firm is not returning a loss. Therefore, apart from being a proxy for firm profit, cash dividends can also serve as a benchmark for measuring a firm's financing constraint. If it is helpful in explaining the relation between abnormal phenomenon and firm profit using cash dividend grouping, then logically, it would also imply that financing constraint is related to a firm's operational difficulty. In order to address this issue, we adopt three other proxy variables that measure financing constraint. These variables include debt-to-total capital ratio, cash flow-to-total capital ratio, and the KZ-Index, which allow the researchers to further examine subgroups and robustness.

Table 3: Monthly Overlapping Regression – Firm Size

	Panel A: Full Sample			Panel B: Without Cash Dividend Issuance			Panel C: With Cash Dividend Issuance		
	X_{52}	X_{max}	R^2	X_{52}	X_{max}	R^2	X_{52}	X_{max}	R^2
Small									
1-Month	0.18***	-0.20***	0.08	0.23***	-0.26***	0.08	0.04**	-0.04	0.03
	(5.82)	(-5.53)		(6.60)	(-6.25)		(2.01)	(-1.49)	
3-Month	0.54***	-0.58***	0.10	0.7***	-0.77***	0.12	0.13***	-0.11**	0.04
	(8.71)	(-7.83)		(10.35)	(-9.33)		(3.46)	(-2.31)	
6-Month	0.73***	-0.69***	0.17	1.01***	-1.03***	0.20	0.22***	-0.15***	0.11
	(7.88)	(-6.19)		(9.10)	(-7.52)		(4.94)	(-2.58)	
12-Month	0.53***	-0.34***	0.22	1.02***	-0.90***	0.28	0.4***	-0.26***	0.21
	(5.36)	(-2.73)		-8.61	(-6.13)		(7.75)	(-3.69)	
Big									
1-Month	0.04**	-0.04	0.04	0.06***	-0.07**	0.03	0.05***	-0.05**	0.03
	(2.00)	(-1.44)		(2.87)	(-2.45)		(2.92)	(-2.55)	
3-Month	0.05	-0.01	0.11	0.11***	-0.11**	0.03	0.14***	-0.14***	0.07
	(1.20)	(-0.15)		(2.67)	(-1.99)		(4.10)	(-3.44)	
6-Month	0.04	0.08	0.26	0.09	-0.02	0.11	0.29***	-0.27***	0.15
	(0.73)	(1.31)		(1.49)	(-0.23)		(7.07)	(-5.50)	
12-Month	0.18***	-0.01	0.40	0.32***	-0.26***	0.22	0.49***	-0.48***	0.25
	(3.18)	(-0.13)		(5.02)	(-2.93)		(10.83)	(-8.36)	

This table presents the results for the monthly overlapping regression, with the regression shown below: $R_{future,t} = \alpha_0 + \beta_1 R_{pass,t} + \beta_2 X_{52,t} + \beta_3 X_{max,t} + \beta_4 D_t + \beta_5 I_t + \varepsilon_t$ *$R_{future,t}$ represents the future excess return (1, 3, 6, and 12 months); $R_{pass,t}$ represents the past excess return (1, 3, 6, and 12 months) and the corresponding future excess return; $X_{52,t}$ represents the extent to which the Taiwan Weighted Index approaching its 52-week high; $X_{max,t}$ represents the extent to which the Taiwan Weighted Index approaches its historic high; D_t represents the Taiwan Weighted Index at its historic high; I_t represent the Taiwan Weighted Index set to the new high. The risk-free rate is the one-year fixed-term deposit rate of the First Bank of Taiwan. The sample period covers the period 1995–2015. Repeated sampling is conducted on a monthly basis. The Newey-West method is adopted to control heterogeneity and autocorrelation. The values in the brackets are t-values. The asterisks *, **, and *** represent 10%, 5%, and 1% levels of significance, respectively.*

Explanatory Capability of the Three-Factor Model

Subsequent to confirming that the presence of cash dividend issuance is helpful in clarifying under- and overreaction phenomena, it is worth further exploring whether financing constraint is an important characteristic in determining asset portfolio pricing. Theoretically, when the three-factor model has explained three variables, the intercept α no longer carries any meaning. To test this hypothesis, we continue to examine the presence of cash dividend issuance in Panels B and C of Tables 2 and 3. Concerning the coefficients of regression for the various holding periods, we want to observe if they can be captured by the HML and SMB factors. The result shows that the group with a holding period of six months fits our expectation, and hence, we use this group to conduct the three-factor regression analysis. The results are presented in Table 4. Panel A of Table 4 shows that without grouping, SMB and HML do exhibit significant explanatory capability: 0.9063 and 0.2355, respectively. However, the intercept α is significant and not zero, suggesting that there are still other factors that cannot be captured by the model. The samples grouped by the presence of dividend issuance are displayed in Panels B and C.

In Panel B, the RMF coefficient for firms that do not issue cash dividend increases to 1.1584; *SMB* and *HML* decrease to 0.5735 and 0.1791, respectively, and all three are significant. The intercept α fits our expectations and no longer carries meaning. This result implies that for firms that do not issue cash

dividends, these three factors can completely explain the variation in returns. Moreover, it is apparent that in Panel C, the RMF and SMB for firms that issue cash dividends decrease to 0.9714 and 0.7860, respectively, whereas *HML* increases to 0.2980. All three factors are significant, and yet the intercept α is not zero, which remains the same as before grouping is done, suggesting that it cannot completely explain the variation in returns. In general, the results in Table 4 indicate that the Fama-French three-factor model can only explain the excess returns for those firms that do not issue cash dividends (with a financing constraint), but as such, cannot completely explain the excess returns for those that do issue cash dividends (without a financing constraint)

Table 4: Three-Factor Regression Analysis

	Panel A: Full Sample	Panel B: Without Cash Dividend Issuance	Panel C: With Cash Dividend Issuance
α	0.0044***	-0.0002	0.0075***
	(2.8092)	(-0.0923)	(3.6026)
RMF	1.0592***	1.1584***	0.9714***
	(135.9235)	(93.6937)	(92.5167)
SMB	0.9063***	0.5735***	0.7860***
	(42.3430)	(19.9452)	(37.1317)
HML	0.2355***	0.1791***	0.2980***
	(21.8586)	(11.3323)	(19.5870)
R^2	0.9526	0.8969	0.9081

The regression for the three-factor model is described as follows: $RPF = \alpha + \beta_1 RMF + \beta_2 SMB + \beta_3 HML + \varepsilon i$
RPF represents the abnormal returns of the asset portfolio; RMF represents the market risk premium; SMB represents size premium; HML represents book-to-market ratio premium. The risk-free rate is the one-year fixed-term deposit rate of the First Bank of Taiwan. The sample period covers 1995 to 2015. Repeated sampling is conducted on a monthly basis. The values in the brackets are t-values. The asterisks, **, and *** represent 10%, 5%, and 1% levels of significance, respectively.*

To be prudent with our results, it is necessary to test the reaction prior to grouping the data. Looking back at the reaction of various holding periods prior to the grouping in Panel A of Table 2, we find that in the three-month holding period, X_{max} in the value stocks is highly significant, whereas in the growth stocks, such a variable appears to be insignificant. Theoretically, overreaction phenomena can be captured through the calculation of the HML factor. The reaction of various holding periods prior to the grouping in Panel A of Table 3 is similar to that of the three-month group. X_{52} and X_{max} appear significant in small stocks but this is not the case for large stocks. Therefore, in theory, through the calculation of HML and SMB factors for the three-month holding period, the group should be able to completely capture under- and overreaction phenomena. Owing to this, we speculate that the explanatory capability of the three-factor model in the presence of dividend issuance for the three-month holding period would be better than that of the six-month holding period. By the same token, we also extend the examination to the subsamples of various holding periods. As there appears to be a ten-year cycle in the stock market of Taiwan, we segment the data into three subsamples with a ten-year period for each. The subsamples include the 1997 global financial crisis, the bursting of the 2000 technology bubble, the subprime mortgage crisis of 2007, and the subsequent global crisis in 2008. Through the frequency and length of the systemic risks, we examine whether our findings are robust. The results are shown in Table 5.

Owing to the fact that every factor has a significant explanatory capability and the emphasis of this research lies in the discussion of the significance of the intercept α, Table 5 only presents such significance. It is apparent in Panel A of Table 5 that the intercept α of Sample A (without being segmented) is significant, implying that there are still other anomalies in the returns that cannot be explained by the three-factor model. However, after grouping, we find in Panel C that the intercept α is even more significant for those firms that issue cash dividends. The intercept α for those that do not issue cash dividends in Panel B no longer carries meaning. This finding further strengthens our speculation. We further examine the subsamples of various periods and find that the intercept α in Samples C and D of Panel C appears to be significant and not zero; only Sample B is not significant. On the other hand, the intercept α for those firms that do not issue cash dividends in Panel B is not significant for all subsamples. This result confirms that our finding is, in fact, robust: under the circumstances where a cash dividend is not issued, through the calculation of the HML and SMB factors, under- and overreaction phenomena can be captured, resulting complete explanatory capability of the three-factor model.

Table 5: Three-Factor Model Regression Analysis – Cash Dividend

	Panel: A Full Sample	Panel B: Without Cash Dividend Issuance	Panel C: With Cash Dividend Issuance
Sample A: 1995.6~2015.5			
α	0.0020*	-0.0009	0.0047***
	(1.6839)	(-0.4874)	(3.1856)
Sample B: 1995.6~2005.5			
α	-0.0028	-0.0026	-0.0016
	(-1.601)	(-1.2139)	(-0.6976)
Sample C: 2000.6~2010.5			
α	0.0007	0.0012	0.0010*
	(1.2747)	(1.4271)	(1.7092)
Sample D: 2005.6~2015.5			
α	0.0084***	0.0035	0.0114***
	(5.6846)	(1.2599)	(7.5182)

The regression for the three-factor model is described as follows: $RPF = \alpha + \beta_1 RMF + \beta_2 SMB + \beta_3 HML + \varepsilon i$
*RPFrepresents the abnormal returns of the asset portfolio; RMF represents the market risk premium; SMB represents size premium; HML represents the book-to-market ratio premium. The risk-free rate is the one-year fixed-term deposit rate of the First Bank of Taiwan. The sample period is 1995–2015. The holding period of the asset portfolio is three months. Grouping is determined by the presence of cash dividend issuance. The values in the brackets are t-values. The asterisks *, **, and *** represent 10%, 5%, and 1% levels of significance, respectively.*

Assuming that firms that do not issue cash dividends are significant to the three-factor model, we ask whether this implies that firms facing financing constraints are capable of capturing the returns of the common factor through the market, size, and book-to-market effects. Apart from the proxy for firm profit, cash dividend is also a sound measuring tool for financing constraint. Therefore, we speculate that financing constraint is also the interfering factor for size and book-to-market effects. Debt-to-total capital ratio, cash flow-to-total capital ratio, and the KZ-Index are then adopted as proxies for financing constraint, through which a robustness test can be applied to the groups of financially constrained and non-financially constrained firms. At the same time, the examination can also be applied to determine whether financing constraint is the critical aspect in improving the explanatory capability of the three-factor model. Table 6 presents the result for the three-factor regression with grouping under financing constraint. First, after conducting a subsample, the intercept α of low debt-to-total capital ratio (*LDC*) firms is consistently significant and not zero. In the case of firms with high debt-to-total capital ratio (*HDC*), apart from the intercept α for the subsample of Sample B not being significant, the three-factor model is fully capable of explaining future returns. In addition, the intercept α for firms with high cash flow-to-total capital ratio (*HCC*) is consistently significant and not zero. As for firms with low cash flow-to-total capital ratio (*LCC*), the intercept α is only significant in Samples A and B, and yet, carry no meaning in Samples C and D. Finally, the intercept α for firms with a low KZ-Index (LKZ) is consistently significant and not zero. For firms with high KZ-Index (HKZ), apart from the intercept α in Sample B not being significant, the remaining subsamples of the three-factor model cannot explain future returns.

Table 6: Three-Factor Model Regression Analysis – Financing Constraint

	Firms Without Financing Constraint			Firms With Financing Constraint		
	LDC	*HCC*	*LKZ*	*HDC*	*LCC*	*HKZ*
Sample A: 1995.6~2015.5						
α	0.0054***	0.0138***	0.0424***	0.0054***	-0.0127***	0.0484***
	(4.2025)	(11.8097)	(2.7577)	(3.6333)	(-7.1149)	(3.1547)
Sample B: 1995.6~2005.5						
α	0.0041*	0.0135***	-0.0655***	0.0012	-0.0247***	0.0288
	(1.9016)	(7.3682)	(-2.7451)	(0.5090)	(-9.2670)	(1.4133)
Sample C: 2000.6~2010.5						
α	0.0103***	0.0224***	0.212***	0.0172***	0.00148	0.2017***
	(5.6234)	(12.636)	(10.1146)	(7.8756)	(0.5749)	(9.4190)
Sample D: 2005.6~2015.5						
α	0.0077***	0.0153***	0.1643***	0.0104***	-0.0028	0.0724***
	(5.6168)	(10.9785)	(10.4739)	(6.1415)	(-1.3007)	(3.3454)

The regression for the three-factor model is described as follows: $RPF = \alpha + \beta_1 RMF + \beta_2 SMB + \beta_3 HML + \varepsilon i$
*RPFrepresents the abnormal returns of the asset portfolio; RMFrepresents the market risk premium; SMB represents size premium; HML represents the market risk premium; SMB represents size premium; HML represents book-to-market ratio premium. The risk-free rate is the one-year fixed-term deposit rate of the First Bank of Taiwan. The sample period covers from the period 1995–2015. The KZ-Index is set on the first day of June; grouping is ranked from large to small, with the sample being divided equally into three subgroups. The top and bottom groups are set as the subgrouping standard (the same grouping method as the debt-to-total capital ratio and cash flow-to-total capital ratio). The values in the brackets are t-values. The asterisks *, **, and *** represent 10%, 5%, and 1% levels of significance respectively.*

Combining the results in Table 6, the intercept α for firms without a financing constraint (*LDC*, *HCC*, and *LKZ*) is consistently significant and not zero. The future returns for firms with financing constraints (*HDC*, *LCC*, and *HKZ*) for specific time periods can be completely explained by the three-factor model. The result explains that under the three-factor model, the performance of firms with financing constraints is better than those without financing constraints, i.e., the Fama-French three-factor model can only provide logical explanations on financing constraint from the risk perspective, but is not capable of providing adequate explanations for firms with low risk and low financing constraint. This result proves our speculation that financing constraint is the critical factor in raising the explanatory power of the three-factor model.

CONCLUSION

Financing constraint is a precondition to financial distress. Even though financing constraint does not translate to financial distress, from the risk perspective the core of the factor model being size, book-to-market ratio and stock return share common risk factors. This can be explained through the risk compensation of financial distress. We logically suspect that this is related to a firm's inability to obtain the needed funds due owing to a financing constraint. From the behavioral perspective, a financing constraint is the result of asymmetric information. The higher the level of information asymmetry, the more difficult it is for a firm to obtain external funds. Such a situation makes it harder for external investors to assess actual firm value; consequently, this brings about psychological bias and the eventual mispricing of firm stock. Therefore, we believe that from the financing constraint perspective, it should be possible to bring about a common explanation for the debate on the risk and behavioral perspectives on market anomalies. This study conducts empirical analysis on the weekly stock price data of companies listed on the Taiwan Stock Exchange between 1995 and 2015. First, from the behavioral perspective and on the basis of investors' limited attention and anchoring psychology, the grouping of the asset portfolio index is by individual characteristics including value stocks, growth stocks, large stocks, and small stocks (Yang, Li, and Hsu, 2016). Utilizing such an index and the 52-week high as well as historic high ratios, we measure the extent of under- and overreactions of the investor (Li and Yu, 2012). Subsequently, we use the nature of the three-factor model to capture whether under- and overreaction phenomena are prevalent in different holding periods for these two proxy variables. Under further subgrouping by the financing constraint characteristic, the analysis explains the difference resulting from the book-to-market ratio and the scale effect. Finally, from the risk perspective, we examine the inference through the explanatory capability of the three-factor model.

Empirical evidence shows that under- and overreaction generally exists in the Taiwan stock market. The cash dividend characteristic is the primary cause of the sign abnormality for the book-to-market ratio and size effect. The three-factor model only has the complete explanatory capability for firms that do not issue cash dividends, proving that cash dividend is capable of explaining the extent of the under- and overreaction phenomena, and hence is an important factor in bringing about the expected return of the capital asset. This coincides with the critical link between the risk perspective of firm profit as the relative distress hypothesis and mispricing hypothesis of the behavioral perspective. Apart from being the proxy for firm profit, cash dividend is also a sound measure for the financing constraint of the firm. We use the *KZ* indicator and other proxies for financing constraint to conduct the robustness test and evidence shows that financing constraint is the critical factor in the improvement of the explanatory capability of the three-factor model. Our evidence also proves that the difference of market abnormality can be more logically explained from the financing constraint perspective. Financing constraint provides a common explanation for the risk perspective and behavioral perspective literature.

Examining explanations in discussions of market anomalies from the risk and behavioral perspectives, we find firm profit to be the critical link between the two. According to Section 241 of the Taiwan Companies Act, cash dividends can be issued only in the case where a firm is not making a loss. Therefore, we adopt cash dividend as the proxy for firm profit in order to conduct the empirical examination and consequently obtain cogent results. Since cash dividends derive special meaning in the context of the Taiwan stock market, our results also prove that cash dividends are the most important factors that affect the expected returns on stock. Therefore, we recommend that future research can further examine whether the inclination of the issuance of cash dividend by firm managements is aimed at meeting special requirements of the investors. Alternately, is it possible that investor sentiments alter a firm's dividend policy? However, owing to limited data, we are unable to further discuss the effect of investor category on the results. As to the measure of investor reaction from the behavioral finance perspective, the extent of research seems to be slightly inadequate. In the event of future research obtaining these data, we recommend that it be incorporated in the investor category variable in the discussion of the other characteristics of the firm; such a step would clarify the factors that drive such phenomena in order to achieve a more precise result. On the other hand, investor composition varies from nation to nation and can be affected by internal factors such as personality, preference, emotion, and so on, as well as external factors such as social environment, economic performance, government policy, and so on. Therefore, we would recommend future researchers to utilize the data from different nations in order to examine the results put forth by this study. International evidence could make our results more complete and help in making them more objective.

REFERENCES

Almeida, H. and M. Campello (2007) "Financial Constraints, Asset Tangibility, and Corporate Investment," *Review of Financial Studies*, vol. 20(5), p. 1429-1460

Banz, R. W. (1981) "The Relationship between Return and Market Value of Common Stocks," *Journal of Financial Economics*, vol. 9(1), p. 3-18

Barberis, N., A. Shleifer, and R. Vishny (1998) "A Model of Investor Sentiment," *Journal of Financial Economics*, vol. 49(3), p. 307-343

Basu, S. (1983) "The Relationship between Earnings' Yield, Market Value and Return for NYSE Common Stocks: Further Evidence," *Journal of Financial Economics*, vol. 12(1), p. 129-156

Chan, C. C. and K. T. Wang (2005) "The Effect of Stock Return Variation on Corporate Investment Decisions under Financial Constraints," *Journal of Management & Systems*, vol. 12(4), p. 55-78

Chan, C. C., Y. H. Chang, and H. W. Hsu (2016) "Can the Dividend Payout Ratio be an Indicator of Financing Constraints?," *Review of Securities and Futures Markets*, vol. 28(2), p. 37-70

Chan, K. and N. F. Chen (1991) "Structural and Return Characteristics of Small and Large Firms," *Journal of Finance*, vol. 46(4), p. 1467-1484

Daniel, K., D. Hirshleifer, and A. Subrahmanyam (1998) "Investor Psychology and Security Market Under- and Overreactions," *Journal of Finance*, vol. 53(6), p. 1839-1885

Daniel, K. and S. Titman (1997) "Evidence on the Characteristics of Cross Sectional Variation in Stock Returns," *Journal of Finance*, vol. 52(1), p. 1-33

DeBondt, W. F. and R. Thaler (1985) "Does the Stock Market Overreact?" *Journal of Finance*, vol. 40(3), p. 793-805

Fama, E. F. and K. R. French (1993) "Common Risk Factors in the Returns on Stocks and Bonds," *Journal of Financial Economics*, vol. 33(1), p. 3-56

Fama, E. F. and K. R. French (1996) "Multifactor Explanations of Asset Pricing Anomalies," *Journal of Finance*, vol. 51(1), p. 55-84

Fama, E. F. and French, K. R. (2015) "A Five-factor Asset Pricing Model," *Journal of Financial Economics*, vol. 116(1), p. 1-22

Fazzari, S. M., R. G. Hubbard, B. C. Petersen, A. S. Blinder, and J. M. Poterba (1988) "Financing Constraints and Corporate Investment," *Brookings Papers on Economic Activity*, vol. 1988(1), p. 141-206

Hong, H. and J. C. Stein (1999) "A Unified Theory of Underreaction, Momentum Trading, and Overreaction in Asset Markets," *Journal of Finance*, vol. 54(6), p. 2143-2184

Hovakimian, G. and S. Titman (2006) "Corporate Investment with Financial Constraints: Sensitivity of Investment to Funds from Voluntary Asset Sales," Journal of Money, Credit and Banking, vol. 38(2), p. 357-374

Jegadeesh, N. and S. Titman (1993) "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency," *Journal of Finance*, vol. 48(1), p. 65-91

Jensen, M. C. (1986) "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review*, vol. 76(2), p. 323-329

Jensen, M. C. and W. H. Meckling (1976) "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," *Journal of Financial Economics*, vol. 3(4), p. 305-360

Kaplan, S. N. and L. Zingales (1997) "Do Investment-cash flow Sensitivities Provide Useful Measures of Financing Constraints?," *Quarterly Journal of Economics*, vol. 112(1), p. 169-215

Kothari, S. P., J. Shanken, and R. G. Sloan (1995) "Another Look at the Cross-section of Expected Stock Returns," *Journal of Finance*, vol. 50(1), p. 185-224

Lakonishok, J., A. Shleifer, and R. W. Vishny (1994) "Contrarian Investment, Extrapolation, and Risk," *Journal of Finance*, vol. 49(5), p. 1541-1578

Lamont, O., C. Polk, and J. Saaá-Requejo (2001) "Financial Constraints and Stock Returns," *Review of Financial Studies*, vol. 14(2), p. 529-554

Li, J. and J. Yu (2012) "Investor Attention, Psychological Anchors, and Stock Return Predictability," *Journal of Financial Economics*, vol. 104(2), p. 401-419

Lintner, J. (1965) "The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets," *Review of Economics and Statistics*, vol. 47(1), p. 13-37

Maestro, M. H., A. De Miguel, and J. Pindado (2001) "Financial Constraints: Models and Evidence from International Data," Working Paper, Salamanca University

Mossin, J. (1966) "Equilibrium in a Capital Asset Market," *Econometrica: Journal of the Econometric Society*, vol. 34(4), p. 768-783

Myers, S. C. and N. S. Majluf (1984) "Corporate Financing and Investment Decisions when Firms have Information that Investors do not have," *Journal of Financial Economics*, vol. 13(2), p. 187-221

Rouwenhorst, K. G. (1998) "International Momentum Strategies," *Journal of Finance*, vol. 53(1), p. 267-284

Sharpe, W. F. (1964) "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk," *Journal of Finance*, vol. 19(3), p. 425-442

Shefrin, H. and M. Statman (1997) "Comparing Expectations about Stock Returns to Realized Returns," Working Paper, Leavey School of Business, Santa Clara University

Yang, C. W., C. A. Li, and S. T. Hsu (2016) "Investor Attention, Psychological Anchors, and the Stealth Index," Working Paper, National Yunlin University of Science and Technology

BIOGRAPHY

Mr. Chih-Wen Yang is a Ph.D. student in the Department of Finance at the National Yunlin University of Science and Technology.

Dr. Chun-An Li is a Professor of Finance at the National Yunlin University of Science and Technology. He can be contacted at 123 University Road, Section 3, Douliou, Yunlin 64002,

Dr. Sam Ting-Hsin Hsu is a graduate of the Department of Finance at the National Yunlin University of Science and Technology.